1976

Manipulating the Genetic Code: Jurisprudential Conundrums

George P. Smith II

The Catholic University of America, Columbus School of Law

Recommended Citation

George P. Smith II, Manipulating the Genetic Code: Jurisprudential Conundrums, 64 GEO. L J. 697 (1976).

Manipulating the Genetic Code: Jurisprudential Conundrums

George P. Smith, II

64 *Georgetown Law Journal* 697 (1976)

MANIPULATING THE GENETIC CODE: JURISPRUDENTIAL CONUNDRUMS

GEORGE P. SMITH, II*

INTRODUCTION AND OVERVIEW

Substantial scientific evidence indicates that man's genetic inheritance acts as a major influence on his behavior and health.[1] Experts estimate that in the United States one out of every 20 babies is born with a discernible genetic deficiency;[2] of all chronic diseases, between 20 and 25 per cent are predominantly genetic in origin.[3] Patients whose incapacities are known to be genetically determined occupy at least half of the hospital beds in America.[4] Because modern medicine can alleviate the symptoms of some genetic disease syndromes through sophisticated treatment, many who are afflicted with genetic disease and who would not have survived in the past now survive. Medicine can do little to cure genetic defects,[5] however, and those afflicted with genetic diseases who are kept alive by modern technology can reproduce and thus may increase the number of defective genes in the human population's gene profile.[6]

The need to develop treatment for individuals with inherited diseases has prompted much research into techniques for genetic

---

* Associate Professor, University of Pittsburgh School of Law; B.S. 1961, J.D. 1964, Indiana University; LL.M. 1975, Columbia University. I am indebted to the Kennedy Center for Bioethics at Georgetown University, Washington, D.C., whose research facilities greatly assisted me in the preparation of this article. Doris Goldstein, Librarian, was especially helpful. I also wish to acknowledge the helpful criticisms of an earlier draft of this article made by Professors Charles Frankel and R. Kent Greenawalt of Columbia University School of Law and Professor William T. Vukowich of Georgetown University Law Center.

[1] A. Hellegers, Problems of Bioethics: A Report to the Sacred College on the Doctrine of Faith, at 43 (1974) (unpublished monograph in Kennedy Center for Bioethics Library, Georgetown University).

[2] Gorney, *The New Biology and the Future of Man,* 15 U.C.L.A.L. REV. 273, 291 (1968).

[3] Robinson, *Genetics and Society,* 1971 UTAH L. REV. 487.

[4] A. Hellegers, *supra* note 1, at 41.

[5] *See* Waltz & Thigpen, *Genetic Screening and Counseling: The Legal and Ethical Issues,* 68 NW. U.L. REV. 696, 698 (1973). *See also* Address by Dr. Moshe Tendler, Jacob Blauner Memorial Lecture, *Genetic Engineering—The Ethical Implications,* Columbia University, Dec. 5, 1974 (science has developed 57 tests to identify specific genetic diseases in carrier states).

[6] *See* Waltz & Thigpen, *supra* note 5, at 698. *See also* Schmeck, *Scientists Now Can Make Human Genetic Maps,* N.Y. Times, Sept. 14, 1975, at 18, col. 1.

engineering.[7] Under the rubric of the "New Biology," scientists currently are investigating and developing many procedures, including gene deletion, insertion, and surgery, cloning, *in vitro* or test tube fertilization, embryo implantation, parthenogenesis, and amniocentesis.[8] Genetic engineering utilizes some of these procedures to reorganize human genes to produce varied, particular characteristics.[9] Genetic engineering to deal with genetic diseases also may rely on eugenics, the science that deals with the improvement of heredity. A positive eugenics program seeks to develop superior qualities in man through the propogation of his superior genes;[10] the positive eugenicist seeks to produce a "new breed" of man with keener and more creative intelligence.[11] A negative eugenics program attempts only to eliminate genetic weaknesses.[12] In application, positive eugenics programs encourage the fit and proper individuals to reproduce while negative eugenics programs discourage the less fit and those with inheritable diseases from procreating.[13] Abortion is one way of implementing a program of negative eugenics after earlier measures of regulation have failed.[14]

Although genetic research has expanded in recent years, the motivating force behind the New Biology has been basic to human society. Since the time of Plato, people have attempted to improve the human race,[15] and research and experimentation in genetics have followed this tradition, seeking to relieve or totally alleviate human

---

[7] *See* Kass, *The New Biology: What Price Relieving Man's Estate?*, 174 SCIENCE 779, 780 (1971).

[8] *See generally Symposium—Reflections on the New Biology*, 15 U.C.L.A.L. REV. 267 (1968).

[9] Waltz & Thigpen, *supra* note 5, at 696. Some researchers maintain that this type of biomedical engineering is not qualitatively different from toilet training, education, and moral teaching, asserting that all these acts of social engineering are designed to shape man in a particular way in present as well as future generations. *See* Kass, *supra* note 7, at 779.

[10] *See* Vukowich, *The Dawning of the Brave New World—Legal, Ethical and Social Issues of Eugenics*, 1971 U. ILL. L.F. 189, 222. *See generally* Davis, *Prospects for Genetic Intervention in Man*, 170 SCIENCE 1279 (1970); Hirschhorn, *Human Genetics*, 224 J.A.M.A. 597 (1973).

[11] Frankel, *The Specter of Eugenics*, 57 COMMENTARY 25, 30 (1974).

[12] *Id.*

[13] *See* Smith, *Through a Test Tube Darkly: Artificial Insemination and the Law*, 67 MICH. L. REV. 127, 147 (1968).

[14] *See generally* Green, *Genetic Technology: Law and Policy for the Brave New World*, 48 *IND. L.J. 559 (1973)*.

[15] *See* T. DOBZHANSKY, MANKIND EVOLVING 245 (1962); M. HALLER, EUGENICS 3 (1963).

suffering that is genetically determined. These research efforts reflect the belief that society as a whole would prosper from methods to make humans more fit because it would be populated by the best physical specimens who, in turn, would beget superior offspring.[16] Some individuals have been motivated to undertake genetic experiments by the power of possible scientific creation and manipulation.[17] Adolph Hitler directed his nation toward the achievement of "Master Race" status, not only by attempting to rid Germany of what he considered negative genetic strains, but also by promoting a positive program of eugenics, *Lebensborn* or Fountain of Life, designed to create a German "super race" through selective breeding.[18] The current quest to manipulate the human genetic code results from both the traditional desires to increase scientific knowledge and rid the world of disease and infirmity, and the more modern objectives to limit or contain population growth and to provide children to infertile marriage partners that desire a family. The desire to remake man physically might also be attributed to what one scholar has termed the modern idea of social and political revolution.[19]

Despite the traditional origins of genetic research, genetic engineering presents serious legal, ethical, and social questions that remain unanswered. The misapplication of scientific knowledge may have adverse and sometimes ruinous effects.[20] The central problem posed by current efforts to manipulate the genetic code concerns man's reaction to self-knowledge about his future. As man begins to induce and manipulate life, he must also begin to question the limits of free will and of self-determination.[21] As man acquires these godlike powers, he must endeavor to execute them with a rational

---

[16] *See* Dobzhansky, *Comments on Genetic Evolution*, 90 DAEDALUS 451, 470-73 (1961); Kass, *New Beginnings in Life*, in THE NEW GENETICS AND THE FUTURE OF MAN 18 (M. Hamilton ed. 1974).

[17] Davis, *Ethical and Technical Aspects of Genetic Intervention*, 285 NEW ENG. J. MED. 799, 800 (1971).

[18] *See* TIME, Oct. 28, 1974, at 33-36. Phase one of *Lebensborn* involved a program of selective sexual intercourse between carefully screened German women and SS men, who were regarded as racially and politically perfect German men. Once a successful pregnancy resulted, the prospective mothers were taken to one of twelve special maternity centers and given both special medical attention and lavish personal care. The second phase of *Lebensborn* involved the kidnapping of hundreds of thousands of children from Poland, Czechoslovakia, Yugoslavia, Norway, and France in order to improve the "breeding stock" of the Fatherland. The children were taken to indoctrination centers and then put up for adoption to racially pure and ideologically trustworthy German families. *Id.*

[19] Frankel, *supra* note 11, at 33.

[20] Address by Dr. Moshe Tendler, *supra* note 5.

[21] A. Hellegers, *supra* note 1, at 44. *See generally* Smith, *Theological Reflection and the New Biology*, 48 IND. L.J. 605 (1973).

purpose and in a spirit of humanism;[22] he should seek to minimize human suffering.[23] Genetic engineering that contributes to the social good should be utilized fully.[24]

Under this ethical standard, society still must carefully define the social good. The quality of life that genetic manipulation promises must be evaluated and weighed against the sanctity of life. Genetic manipulation provides a perilous opportunity that either may threaten freedom or may enhance it, depending upon the balance struck between its use for individual need satisfaction and societal good.[25] Discussion of several possible genetic engineering programs will highlight the important legal and social choices that society must confront as these programs become possible to implement.

IMPLEMENTING A NEGATIVE EUGENICS PROGRAM

In seeking to eliminate genetic weaknesses from the society, a negative eugenics program necessarily requires some process to determine genetic composition. Genetic screening and counseling accomplish this objective by identifying carriers of genetic diseases and advising couples whether reproduction is biologically desirable.[26] That screening and counseling may occur at both preconceptual and postconceptual stages.[27] A simple preconceptual screening procedure consists of withdrawing and analyzing a blood sample to determine if an individual possesses any recessive traits for a genetic disease.[28] Postconceptual screening and counseling procedures are more medically complicated and also pose more complex legal issues.

AMNIOCENTESIS

A recently developed postconceptual screening procedure, amniocentesis, has emerged as a principal element of negative eugenic programming. The procedure consists of inserting a needle through the abdominal wall of a pregnant woman into the amniotic sac containing the fetus, withdrawing a sample of the sac fluid, and

---

[22] *See* K. VAUX, BIOMEDICAL ETHICS 111 (1974). *See generally* L. AUGENSTEIN, COME LET US PLAY GOD (1969); R. DUBOS, MAN ADAPTING (1965).

[23] *See* Pauling, *Foreword* to *Symposium*, *supra* note 8, at 270.

[24] Greenawalt, *A Contextual Approach to Disobedience*, 70 COLUM. L. REV. 48, 50 (1970).

[25] Shinn, *Genetic Decisions: A Case Study in Ethical Methods*, 52 SOUNDINGS 229, 309 (Fall 1969); *see* Callahan, *Symposium—The Law and the Biological Revolution*, 10 COLUM. J.L. & SOC. PROBS. 47, 70 (1973).

[26] Davis, *supra* note 17, at 799.

[27] Waltz & Thigpen, *supra* note 5, at 700.

[28] *Id.*

analyzing it.[29] Since the sac contains cells from different parts of the fetus, analysis of this sample reveals the sex of the fetus and also whether it will be affected with certain genetic disabilities.[30] By permitting a physician to predict accurately the presence of certain genetic defects, amniocentesis significantly advances standard genetic counseling procedures that must rely on probabilities.[31]

If amniocentesis reveals a genetically defective fetus, the parents face the difficult choice of whether to abort the fetus. A couple informed of a genetically defective fetus may decide for religious, personal, or ethical reasons that they want to guarantee the birth of the life they created and therefore allow the pregnancy to continue. Such a choice raises the issue whether the child could bring a tort action against his parents for wrongful life. Under current law such a claim likely would fail.[32] However, "[i]t seems likely that *Roe v. Wade*, coupled with a shift in social attitudes concerning abortion and the sanctity of life will cause a reversal in the courts' negative attitude toward wrongful life suits."[33]

Whether a child may bring a wrongful life action against his parents involves a balancing of several interests. The parents' attitudes on the right to life and their declarations of parental love must be considered, although they may not justify a life of hardship and physical pain for a malformed child.[34] A strong enough social policy

---

[29] Robinson, *supra* note 3, at 488 n. 24.

[30] *Id.* at 488.

[31] *Id.* The University of Colorado Medical Center permits amniocentesis only if there are signs of chromosomal abnormalities, biochemical diseases, or "inborn errors of metabolism," or sex-linked recessive conditions such as muscular dystrophy and hemophilia. *Id.*

Pregnant women over 35 years of age have a one and one-half percent risk of having a child with abnormal chromosomes. *Id.* at 489. Down's syndrome, mongolism, is one of the most distressing examples of a chromosomal abnormality. Professor Robinson reports:

> The 10% of pregnant women who are thirty-five years of age or older are responsible for the birth of 50% of the children with Down's syndrome. Roughly 7,000 of these retarded babies are born each year in the United States and the majority of them eventually end their days in institutions for the retarded. The financial cost to our society has been estimated to be several billions of dollars per year.

Id.

[32] *Cf.* Pinkney v. Pinkney, 198 So. 2d 52, 54 (Fla. App. 1967) (court refuses to recognize tort of wrongful life for plaintiff, bastard, against father); Zepeda v. Zepeda, 41 Ill. App. 2d 240, 259, 190 N.E.2d 849, 858 (1963), *cert. denied,* 379 U.S. 945 (1964) (same). Courts similarly have rejected a wrongful life action by a genetically defective child against doctors or hospitals for failure to inform the parents of genetic defects of which they knew or should have known. *See* Gleitman v. Cosgrove, 49 N.J. 22, 28, 227 A.2d 689, 692 (1967); Steward v. Long Island College Hosp., 296 N.Y.S.2d 41, 46-47 (1968), *modified,* 35 App. Div. 2d 531, 313 N.Y.S.2d 502 (1970), *aff'd,* 30 N.Y.2d 695, 283 N.E.2d 616, 322 N.Y.S.2d 640 (1972). *See generally* Note, *A Cause of Action for "Wrongful Life"*, 55 MINN. L. REV. 58 (1970); Annot., 22 A.L.R. 3d 1441 (1968).

[33] Friedman, *Legal Implications of Amniocentesis,* 123 U. PA. L. REV. 92, 155 (1974).

[34] Some parents may procreate in order to gratify their own egos; the birth of a child

may exist to justify the imposition of a parental duty to prevent defective birth by contraception or abortion and to impose liability for the failure to do so.[35] A court might find alternatively that parents have a duty to avoid the affirmative act of birth that may further harm a defective fetus and subject it to a life of suffering outside the womb.[36] The societal interest in healthy offspring may exist not only to protect the prospective children but also to assure a more healthy society. Imposing a duty on the parents to abort a genetically malformed fetus after science identifies the malformation is consistent with the social ethic that seeks to minimize human suffering;[37] it would achieve the greatest good for society as a whole, for the prospective parents, and even for the fetus.[38]

GENETIC SCREENING AND COUNSELING PROGRAMS

Some of those concerned with negative eugenics currently have emphasized the need for the wide application of traditional screening procedures to identify the carriers of certain diseases.[39] Certain leaders of Jewish communities, for example, encourage citizens of their communities to participate in screening to identify carriers of the Tay Sachs recessive gene, which can cause a fatal debilitating illness similar to sickle cell anemia.[40] Federal legislation permits the

---

gives them a "second chance" to catch glimpses of themselves through the child and to live again through the child. *See* McGrath & McGrath, *Why Have a Baby?*, N.Y. Times, May 25, 1975, Magazine, at 16, 26.

[35] *See generally* W. Prosser, Handbook of the Law of Torts § 55 (4th ed. 1971); Fried, *The Value of Life*, 82 Harv. L. Rev. 1415 (1969).

[36] *See* W. Prosser, *supra* note 35, at § 56.

[37] *See* Pauling, *supra* note 8, at 270.

[38] Professor Robertson has suggested:

> [T]he strongest claim for not treating the defective newborn is that treatment seriously harms the infant's own interests, whatever may be the effect on others. When maintaining his life involves great physical and psychological suffering for the patient, a reasonable person might conclude that such a life is not worth living. Presumably the patient, if fully informed and able to communicate, would agree.

Robertson, *Involuntary Euthanasia of Defective Newborns: A Legal Analysis*, 27 Stan. L. Rev. 213, 252 (1975). *See generally* Comment, *Proposed State Euthanasia Statutes: A Philosophical and Legal Analysis*, 3 Hofstra L. Rev. 115 (1975). One Catholic theologian has suggested that if a child with a birth defect would be born without any "potential for human relationships," the preservation of his life is futile. *See* Editorial Opinion and Comment, 61 A.B.A.J. 489, 490 (1975) (quoting Father Richard A. McCormick of Georgetown University). *See also* Howard, *Parents Tell How They Decided to Let Their Child Die*, Wash. Star-News, Dec. 13, 1974, § B, at 1, col. 1 (relating how parents concluded child dying from internal birth defects should not undergo life sustaining surgery).

[39] *See generally* Rivers, *Grave New World*, Saturday Rev., Apr. 8, 1972, at 23, 26.

[40] Address by Dr. Moshe Tendler, *supra* note 5. Screening efforts also are being conducted in several areas to identify male infants possessing the XYY chromosome pattern,

use of public funds to establish voluntary, genetic screening and counseling programs for carriers of sickle cell anemia;[41] some state legislatures have gone further to require genetic screening of school age children for that trait.[42] New York provides for premarital testing to identify carriers of the same defective gene.[43] Genetic screening programs also may include provisions for counseling.[44] Unfortunately, counseling efforts to date have been sporadic and ineffective.[45] If genetic screening programs are to have any significant impact, more effective counseling techniques must be devised and implemented.[46]

Public acceptance of mandatory genetic screening programs should not be impossible to achieve. Premarital genetic screening would be an easy addition to state statutes that presently require premarital testing for maternal rubella titre, blood group, and Rh status.[47] One scholar asserts that statutes requiring genetic screening for the population at large would be a simple and readily acceptable extension of present laws requiring vaccinations and chest X-rays for school children.[48] Moreover, societal problems such as population control, the cost of supporting the handicapped, and the general welfare of the population favor the trend toward mandatory genetic

---

the so-called "criminal disposition chromosome." Proponents of such screening believe that early identification and medical treatment of individuals born with the XYY chromosome could prevent the behavioral problems identified with the chromosomal pattern. Opponents maintain that the XYY syndrome is a dangerous myth and that the stigma of being identified as XYY creates a self-fulfilling prophecy. *See* Culliton, *Patients' Rights: Harvard is Site of Battle over X and Y Chromosomes,* 186 SCIENCE 715, 715-16 (1974); Smith, *supra* note 13, at 148 n.114.

[41] National Sickle Cell Anemia Control Act, 42 U.S.C. §§ 3006 to 3006-5 (Supp. III, 1973).

[42] *See, e.g.,* ILL. ANN. STAT. ch. 122, § 27-8 (Smith-Hurd Supp. 1975) (exception for refusal of physical examination on constitutional grounds); MASS. GEN. LAWS ANN. ch. 76, § 15A (Supp. 1974) (mandatory only if child susceptible); N.Y. EDUC. § 904 (McKinney Supp. 1974) (exception for refusal based on religious beliefs). *See also* VA. CODE ANN. §§ 32-112.20 to 112.23 (Supp. 1975) (voluntary screening program).

Dr. Linus Pauling has suggested that sickle cell anemia carriers be identified by tattooing the forehead of every carrier. Other recessive genes, such as hemophilia and phenylketonuria, similarly could be identified. Dr. Pauling wistfully suggests that such identification would discourage carriers of the same defective gene "from falling in love with one another," and presumably, from procreating. *See* Pauling, *supra* note 8, at 269.

[43] N.Y. DOM. REL. LAW § 13-aa (McKinney Supp. 1974). Other states provide for voluntary premarital testing for sickle call anemia. *See* CAL. CIV. CODE § 4302 (West Supp. 1974); GA. CODE ANN. § 53-216 (1974).

[44] *See* VA. CODE ANN. § 32-122.22 (Supp. 1975).

[45] Waltz & Thigpen, *supra* note 5, at 701-02 & nn.28-29.

[46] *See id.* at 701-02 & nn.30-31. Confusion as to the significance of possessing the defective gene not only renders screening programs less effective in discouraging reproduction, but the failure to differentiate between the disease and the trait also increases the stigmatization to which carriers are subjected. *Id.*

[47] *See* Frankel, *supra* note 11, at 29.

[48] *See id.*

screening.[49]

Some legal scholars maintain that compulsory genetic screening programs may be unconstitutional.[50] They assert that the taking of a child's blood sample would constitute a physical invasion of the body in violation of the fourth amendment and that a compulsory counseling program would interfere with the fundamental rights to marry and procreate;[51] these critics also contend that a less intrusive voluntary program, together with extensive dissemination of educational material, could accomplish the same objectives.[52] Although genetic screening involves a minor intrusion into an individual's body and may involve a "search" within the meaning of the fourth amendment, the search is not unreasonable and prohibited if executed in a proper manner and justified by a legitimate state interest.[53] Similarly, assuming arguendo that mere screening and counseling interfere with the right to procreate, such interference may be justified by a compelling state interest. The state's interest in improving the quality of a population's genetic pool in order to minimize suffering, to reduce the number of economically dependent persons, and possibly, to save mankind from extinction arguably justifies the infringement of individuals' civil liberties.[54]

Unfortunately, voluntary programs have little value in achieving the purposes for which they are structured. People are too preoccupied with the daily vicissitudes of life to be concerned with prospective occurrences of genetic possibilities. Therefore, although a voluntary program concededly is less intrusive, the only way to achieve positive, enduring results is to implement some form of mandatory genetic screening program.[55]

RESTRICTIONS ON MARRIAGE

An even more effective means of preventing the birth of genetically defective persons is prohibiting marriage between carriers of the same genetic defect. Both constitutional and social objections have been raised to such a restriction on marriage.[56] Existing laws

---

[49] *See id.*

[50] *See* Waltz & Thigpen, *supra* note 5, at 712.

[51] *Id.* at 711-12.

[52] *Id.* at 712.

[53] *Cf.* Schmerber v. California, 384 U.S. 757, 772 (1966) (compulsory blood test to determine intoxication of automobile driver not unreasonable search).

[54] *See* Vukowich, *supra* note 10, at 208.

[55] *See* Pauling, *supra* note 8, at 270-71. *See generally* Note, *Legal Analysis and Population Control: The Problem of Coercion,* 84 HARV. L. REV. 1856, 1865-75 (1971).

[56] *See* Vukowich, *supra* note 10, at 215-16.

prohibiting marriage for eugenic reasons and proposals to restrict marriage between carriers of the same genetic defect are attacked as being excessively broad, and the suggestion is made that only procreation needs to be regulated to ensure both eugenic preservation and responsible parents.[57]

Since procreation traditionally is set within the marriage framework, however, establishing restrictions on marriage is the most practical mechanism for implementing a negative eugenics program. Moreover, married couples prohibited from procreation nonetheless might have children accidentally or intentionally.[58] Whether a state's pursuit of the public's health and welfare would justify an abridgement of the fundamental right of marriage between carriers of the same genetic defect is doubtful. Such restrictions also might well prove ineffective in the contemporary atmosphere that is increasingly tolerant of free love and common law marriage. Thus, it is unlikely that restrictions on marriage would prove to be an acceptable method of eugenic control.

RESTRICTIONS ON REPRODUCTION

Modern cases support the proposition that marital and procreative decisions fall within a constitutionally protected zone of privacy.[59] As long ago as 1941 the Supreme Court declared that man possesses the basic civil right to have offspring;[60] more recently, the Court has held that the choice of whether to give birth is within a constitutionally protected zone of privacy.[61] These broad pronouncements do not force the conclusion, however, that all restrictions on reproduction are per se unconstitutional. If a state may prevent a person from marrying more than one person at a time, should it not have the same power to prevent a person from having

---

[57] *Id.* at 216.

[58] *Id.*

[59] *See, e.g.*, Eisenstadt v. Baird, 405 U.S. 438, 452-55 (1972) (forbidding, on morality grounds, sale or gift of contraceptives to unmarried persons conflicts with fundamental constitutional rights); Loving v. Virginia, 388 U.S. 1, 12 (1967) (state may not infringe freedom to marry person of another race); Griswold v. Connecticut, 381 U.S. 479, 481-86 (1965) (statute forbidding use of contraceptives violates constitutionally protected right of marital privacy).

[60] Skinner v. Oklahoma, 316 U.S. 535, 541 (1941). Concurring in *Griswold v. Connecticut*, Justice Goldberg commented that a compulsory birth control law unjustifiably would abridge the constitutional right of marital privacy. 381 U.S. 479, 497 (1965) (Goldberg, J., with Warren, C.J., & Brennan, J., concurring).

[61] *See* Roe v. Wade, 410 U.S. 113, 153 (1973). *See generally* Altman, *Doctor Guilty in Death of Fetus in Abortion*, N.Y. Times, Feb. 16, 1975, § 1, at 1, col. 3; Kifner, *Doctor Disputes Abortion Method*, N.Y. Times, Feb. 1, 1975, § C, at 5, col. 6; Reinhold, *Abortion Trial's Crucial Issues: When Does Life Begin?*, N.Y. Times, Jan. 12, 1975, at 34, col. 1.

more than one or two children?[62] The right to procreate may not include a right to breed without some restrictions.[63] Societal interests may be sufficiently powerful to justify at least some regulation for limitations on reproduction.[64]

Some legal precedents do uphold the constitutionality of eugenic sterilization. In *Buck v. Bell*[65] the Supreme Court upheld a Virginia statute providing for sterilization of inmates committed to state supported institutions who were found to have a hereditary form of insanity or imbecility.[66] Nearly half the states now have some form of compulsory sterilization legislation,[67] and courts typically uphold such statutes.[68]

The extension of *Buck v. Bell* to sterilization of carriers of recessive defective genes cannot be accomplished without difficulty. Since its decision in that case, the Court increasingly has recognized the right to marry and have children as a fundamental right.[69] Existence of this right requires a state to show a compelling interest

---

[62] *See* Golding & Golding, *Ethical and Value Issues in Population Limitation and Distribution in the United States,* 24 VAND. L. REV. 495, 511 (1971).

[63] *Id.*

[64] *See id.* at 512. Golding and Golding conclude, however, that the unrestricted freedom to procreate should be abridged only for a "good of momentous order." *Id.*

[65] 274 U.S. 200 (1927).

[66] *Id.* at 207. Justice Holmes, speaking for the Court, stated:

> We have seen more than once that the public welfare may call upon the best citizens for their lives. It would be strange if it could not call on those who already sap the strength of the State for these lesser sacrifices, often not felt to be such by those concerned, in order to prevent our being swamped with incompetence. 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.

Id.

[67] Kindregan, *State Power Over Human Fertility and Individual Liberty,* 23 HASTINGS L.J. 1401, 1407 (1972); Paul, *State Eugenic Sterilization History: A Brief Overview,* in EUGENIC STERILIZATION 25, 27 (J. Robitscher, ed. 1973). Virginia's legislation in this area is typical:

> Whenever the director of a hospital shall be of the opinion that a patient in such state hospital is afflicted with any form of hereditary mental illness or with mental deficiency and it is in the best interest of such patient and society that such patient should be sexually sterilized, the director is hereby authorized and directed to proceed . . . .

VA. CODE ANN. § 37.1-171.1 (Supp. 1975). It has been estimated that over 70,000 people have been sterilized under statutes similar to Virginia's. *See* STATISTICS FROM HUMAN BETTERMENT ASS'N OF AMERICA, SUMMARY OF U.S. STERILIZATION LAWS 2 (1958). *See generally* Greenawalt, *Criminal Law and Population Control,* 24 VAND. L. REV. 465, 475 (1971); Vukowich, *supra* note 10, at 214-20.

[68] *See* Oregon v. Cook, 9 Ore. App. 224, 230, 495 P.2d 768, 771-72 (1972) (equal protection challenge based on indigency rejected); *In re* Caritt, 182 Neb. 712, 721, 157 N.W.2d 171, 178 (1968), *appeal dismissed,* 396 U.S. 996 (1970) (same).

[69] *See* notes 59-61 *supra* and accompanying text.

to justify the abridgement of this right.[70] Several factors seem to indicate that the state interest is not as compelling with regard to sterilization of carriers of defective genes as it is with regard to mental incompetents. A mental incompetent may well be unable to be an adequate parent, and the burden of care therefore would fall upon the state.[71] Moreover, the sterilization of mental incompetents in institutions can be said to benefit them directly in that it "enable[s] those who otherwise must be kept confined to be returned to the world . . . ."[72] The Court seemed to have assumed in *Buck v. Bell,* however, that there is a strong likelihood that the child would in fact inherit the defect;[73] the child of a two heterozygous individuals has only a one in four chance of exhibiting that defective trait.[74]

The distinguishing features of *Buck v. Bell* do not indicate that the state cannot offer any compelling justifications to warrant mandatory restriction on reproduction. Such justification can be found in society's interest in the reduction of human suffering, in safeguarding the health and welfare of its citizens, in the allocation of economic resources, and in population control.[75] In *Buck v. Bell* Justice Holmes stressed that "it would be better for all the world . . . if society can prevent those who are manifestly unfit from continuing their kind."[76] Perhaps world conditions have become so complex and resources so valuable that society now has a compelling interest in restricting reproduction by those, who although not "manifestly unfit" themselves, perpetuate human suffering by giving birth to genetically defective offspring.

THE NEW BIOLOGY AND A PROGRAM FOR POSITIVE EUGENICS

ARTIFICIAL INSEMINATION

Artificial insemination, referred to as AID or heterologous insemination, is the process of inseminating a woman with the sperm

---

[70] *See* Shapiro v. Thompson, 394 U.S. 618, 638 (1969).

[71] *See* Oregon v. Cook, 9 Ore. App. 224, 230, 495 P.2d 768, 771-72 (1972).

[72] Buck v. Bell, 274 U.S. 200, 208 (1927). The Court's rationale acquires additional significance because it became the basis for distinguishing *Buck v. Bell* in *Skinner v. Oklahoma,* where the Supreme Court invalidated a statute providing for the sterilization of habitual criminals; the Court in *Skinner* concluded the statute violated the fourteenth amendment's equal protection clause. *See* 316 U.S. 535, 542 (1941).

[73] The statute challenged in *Buck* required only that experience demonstrate heredity plays an important role in the transmission of the mental defect. *See* 274 U.S. at 206. The inmate involved, however, was the daughter of a feeble minded child. *Id.* at 205.

[74] *See* Waltz & Thigpen, *supra* note 5, at 721 & n.131.

[75] *See* Vukowich, *supra* note 10, at 208.

[76] 274 U.S. at 207.

of a donor. Although AID was developed to provide a child to a married couple that could not reproduce due to a physical impediment of the husband, the method today has a new vitality and purpose as a technique for implementing a program of positive eugenics.[77] Sperm banks have been established to maintain semen from "distinguished" persons even beyond their lifetime.[78] Positive eugenicists advocate superior sperm banks to develop the population to a position of genetic strength and to assure the survival of the human race in the event of an insufficient number of acceptable male members to allow normal reproduction.[79] The ultimate goal of positive eugenics is to assure eutelegenesis, mass insemination with superior sperm.[80] This suggestion for use of AID practices to implement a program of positive eugenics should encounter little resistance because these practices infringe upon individual rights only minimally, neither restricting nor prohibiting marriage or reproduction.[81]

In Vitro FERTILIZATION AND EMBRYO IMPLANTS

In 1974 Dr. Douglas Bevis of Leeds University announced that out of approximately thirty attempts to conceive human embryos *in vitro*, or in test tubes, and then implant them *in utero*, or into the wombs of women, he had achieved three successful implants that resulted in the birth of three babies.[82] The three mothers had been infertile because of diseased, blocked, or missing Fallopian tubes. Dr. Bevis had removed ova from each woman, fertilized the ova in test tubes with sperm taken from the women's respective husbands, and then implanted the fertilized eggs into the women's wombs.[83] Dr.

---

[77] *See generally* Smith, *supra* note 13, at 148.

[78] *See id.* at 145, 146. The student newspaper at Columbia University recently advertised for sperm donors, who would be paid for their semen "for artificial insemination for couples who cannot have children due to male infertility." The Columbia Daily Spectator, Oct. 28, 1974, at 5, col. 4.

[79] *See* Smith, *supra* note 13, at 146-47.

[80] *Id.* at 147.

[81] *See* Vukowich, *supra* note 10, at 230-31.

[82] *See* Rorvik, *The Embryo Sweepstakes*, N.Y. Times, Sept. 15, 1974, Magazine, at 17. *See generally* George, *Life in the Lab*, National Observer, July 7, 1973, at 1, col. 1. At the time Dr. Bevis made the announcement, the babies ranged in age from 12 to 18 months. Rorvik, *supra* at 17. *See also* Revillard, *Legal Aspects of Artificial Insemination and Embryo Transfer in French Domestic Law*, 23 INT'L COMP. L.Q. 383 (1974).

[83] *See* Rorvik, *supra* note 82, at 17. To obtain eggs from a female, researchers insert a laparscope near or through a woman's umbilicus into her peritoneal cavity to obtain a direct view of the ovaries. A suction device is employed to pull selected ova from follicles on the ovarian surface. Various hormones are used to regularize the menstrual cycle to ensure that the egg is at the proper stage of maturation when withdrawn, and then the egg

Bevis's announcement has been subject to considerable doubt because he was unwilling to document his research fully.[84]

Some scholars credit Dr. Landrum Shettles, formerly of Columbia University, as the first scientist to achieve test tube fertilization of human eggs in 1953.[85] Dr. Shettles also claims to have achieved an embryo implant in 1963, but it was not allowed to mature.[86] In 1973 he attempted another embryo implant following *in vitro* fertilization, but his superior terminated the experiment before implantation, asserting that further work should be performed with lower primates "to establish whether the number of malformations is acceptable;"[87] his superior also raised the ethical question of who would obtain permission for the fetus to be part of the experiment.[88]

As a consequence of the unauthorized termination of Dr. Shettles's 1973 experiment, the prospective parents filed a $1.5 million lawsuit against Dr. Shettles's superior, claiming the procedures were terminated without their consent. The prospective mother stated:

> I can't see why some people believe a baby conceived in this fashion isn't as sacred as a baby conceived in the normal fashion. There's even more care, more desire, more intent involved here—because so much time, energy, skill and emotion had to be invested in its conception.[89]

Whatever the success of these experiments in the past, *in vitro* fertilization and embryo transplants in humans probably will be fully documented scientific achievements in a few years.[90] For a variety of

---

is exposed to sperm in a test tube. Fertilization normally is achieved within 12 hours, with cleavage into two cells evident within 38 hours. By the end of the fifth day, an embryo reaches the blastocyst stage having 64 or more cells. To avoid rejection of the embryo by the uterus, both the uterus and the embryo must be in a biochemical synchronization that often is difficult to achieve. The embryo may be introduced into the womb surgically through the walls of the uterus or nonsurgically by use of a catheter that is passed through the vagina and cervical canal into the uppermost part of the uterus. *See id.* at 54-56.

[84] *Id.*

[85] *Id.* at 50, 54. *But see* Smith, *supra* note 13, at 127 (Dr. John Rock of Harvard fertilized human ova in the laboratory in 1944).

[86] *See* Rorvik, *supra* note 82, at 56-59.

[87] *Id.* at 59.

[88] *Id.*

[89] *Id.*

[90] Cattle embryo transfer techniques already have resulted in the birth of calves. *See* Brody, *Embryo Transfer Aids Cattle Breeding,* N.Y. Times, Sept. 15, 1974, § L, at 40, col. 4. Researchers are now attempting to refine and perfect these techniques to achieve more efficient breeding methods. If the techniques are perfected, one cow could "mother," genetically speaking, hundreds of calves. *See id.* The cost of the transfer operation at present prohibits mass application of these techniques. *See id.*

Cattle embryo transfer techniques begin with stimulating a genetically superior cow with certain hormones so that it will superovulate or produce a greater quantity of eggs in an estrous cycle than it normally would. *See id.* After the cow is inseminated with prize bull semen, its uterus is "washed" to collect the fertilized eggs. A healthy appearing reasons, women might rely on these techniques to have a child. If a woman is infertile due to a blocked or missing Fallopian tube, an ovum could be taken from one of her ovaries, fertilized in a test tube with her husband's sperm, and implanted in her uterus. If a woman cannot produce normal egg cells, a donor's egg, already fertilized by the husband's sperm through artificial insemination or fertilized *in vitro* with the husband's sperm, could be implanted into her uterus.[91] A woman who cannot carry a baby to term because of a physical disability could enter into a contract with a surrogate or host mother to do so,[92] and an egg fertilized either *in vitro* or *in vivo* could be implanted into the host mother. A career woman, such as a professional athlete, who has no physical disability also may seek the services of a surrogate mother if she does not wish to miss valuable time from her professional interests to carry a baby for the full term.[93]

Married couples also may benefit from successful implantation of *in vitro* fertilization techniques. A number of embryos could be developed from a couple's best available ova and sperm cells, and the couple then could select one embryo for implantation.[94] Successful *in vitro* fertilization also may lead to the development of *in vitro* gestation, enabling a fetus to develop to term completely outside the womb.[95] These two examples would foster a married couple's wish to have a child that is as much genetically their own as is possible physically as a substitute for adopting a child. Married couples also could rely on *in vitro* fertilization techniques to have a child that is not genetically their own. An unmarried person desiring a child also might wish to utilize these methods. Since an unmarried individual would need a donor's egg or sperm in the procedure, such a program could introduce positive eugenic concepts to create children with a stronger genetic heritage. As in the case of AID programs, the incorporation of positive eugenic concepts would infringe individual rights minimally because they neither restrict nor prohibit marriage or reproduction as eugenic programs generally do.

---

fertilized egg, identified by microscopic equipment, is removed from the washing liquid and transferred to the uterus of an ordinary cow. This cow, in turn, acts as a surrogate mother, nourishing the embryo until birth. The transfer of the fertilized eggs frees the original, genetically superior cow from nine months of pregnancy and permits it to be superovulated rather soon again. The technique thus greatly multiplies the opportunities for the birth of high quality offspring. *See id.*

[91] *See* Gaylin, *We Have the Awful Knowledge to Make Exact Copies of Human Beings*, N.Y. Times, Mar. 5, 1972, Magazine, at 11, 48; Rorvik, *supra* note 82, at 50.

[92] *See* Gaylin, *supra* note 91, at 48; *cf.* Rorvik, *supra* note 82, at 50 (eggs from one cow can be implanted in womb of another).

[93] Gaylin, *supra* note 91, at 48.

[94] *Id.*

[95] *Id.*

ASEXUAL REPRODUCTION: CLONING AND PARTHENOGENESIS

The word cloning, which derives from a Greek root meaning cutting, is generally defined as asexual propagation[96] and is a common practice to develop new varieties of plants.[97] In 1966 a team of Oxford University biologists, headed by Dr. John Gurdon, announced that they had grown seven frogs from the intestinal cells of tadpoles.[98] What had been routine in the garden now existed for one group of animals: a new organism produced from a single parent.[99]

Several steps would be required to clone a human. First, the nucleus of a donor's egg cell would be destroyed. A nucleus from any convenient cell of the person to be cloned would be inserted into the enucleated egg by microsurgical techniques not yet fully developed. The new cell, placed in a nutrient medium, would begin to divide and embryo implantation would follow in approximately four to six days.[100] The cloned individual would be the identical twin of the

---

[96] D. RORVIK, BRAVE NEW BABY 109 (1971).

[97] *See* G. TAYLOR, THE BIOLOGICAL TIME BOMB 23-25 (1968); Kuhn, *The Prospect of Carbon Copy Humans*, 60 CHRISTIANITY TODAY No. 14, at 11 (Apr. 9, 1971).

[98] *See* G. LEACH, THE BIOCRATS 94 (1970).

[99] *Id.* Professor James Watson, who pioneered in genetic research and who discovered DNA, has observed:

> A clone is the aggregate of the asexually produced pregnancy of a single cell; for example, all the descendants of a single bacteria present as a colony upon a petri dish. The genetic identicalness of all members of a clone arises from the fact that the normal process of cell division, termed mitosis, produces two daughter cells with identical chromosomal complements. The nuclei of the cells found in the frog's intestine are thus identical to those which could be found in its liver or brain. In contrast, the cell division process, termed meiosis, which generates the sex cells, reduces the chromosome number in half. Only one of each pair of homologous chromosomes enters a sperm or egg. Moreover, a completely random event determines whether the given chromosome is of male or of female origin. Consequently, no two eggs (or sperm) arising in a given individual are ever genetically equivalent. No two sexually produced frogs, having the same two parents, thus will be identical unless they arise by the rare splitting of an already divided fertilized egg into two daughter cells, each of which goes on to develop into a complete embryo. This is the process by which identical human twins are produced. In contrast, all the members of a clone produced by mitosis will be identical, except for the occasional mutant cell resulting from rarely occurring somatic gene mutations . . . it is now routinely possible to produce mature plants starting from highly specialized somatic cells of diploid chromosome number . . . it is highly likely that the embryological development of most higher animals, including man, involves the creation of countless numbers of totipotent somatic nuclei each capable of serving as the complete genetic material for a new organism. This means that, theoretically, all forms of higher animal life may in effect be capable of clonal reproduction.

J. Watson, Potential Consequences of Experimentation with Human Eggs, Jan. 28, 1971 (Paper 1, 3, 4, Harv. Univ. Biological Labs).

[100] *See* D. RORVIK, *supra* note 96, at 114, Lederberg, *Experimental Genetics and*

person who contributed the body cell.[101] Significantly, the establishment of banks of tissue cultures would permit the production of genetic copies of deceased persons through cloning.

Parthenogenesis, commonly referred to as virgin birth, is another form of asexual reproduction.[102] The French-American biologist, Jacques Loeb, achieved parthenogenesis in sea urchins in 1899.[103] More recently, scientists have reported laboratory parthenogenic experiments for frogs and mice.[104] If this process is perfected for humans, a woman one day may produce the necessary egg cell for conception, jolt the egg by pulling an electric switch or administering a necessary drug, thereby enabling it to split, and then have it

---

Human Evolution, 100 AM. NATURAL 519, 526-29 (1966); Watson, *Moving Toward the Clonal Man,* ATLANTIC 50, 50-51 (May 1971). *See generally* Louisell, Biology, *Law and Reason: Man as Self-Creator,* 16 AM. J. JURISPRUDENCE 1, 3 (1971); Note, *Asexual Reproduction and Genetic Engineering: A Constitutional Assessment of the Technology of Cloning,* 47 S. CAL. L. REV. 476 (1974). Cloning could be a useful technique in many situations. If a husband and wife carry a debilitating recessive genetic disease and are unwilling to risk, through normal procreative processes, the birth of a child who in turn might carry their disease, cloning is a viable alternative for them. If the husband is opposed to adoption and the wife has a strong, natural desire to bear her own child, a clone of either the husband or the wife could be developed. J. KATZ, EXPERIMENTATION WITH HUMAN BEINGS 977 (1972). A couple who loses their only child and is incapable of having another could rely on cloning techniques to produce a duplicate of their lost child: one of the child's cells could be cloned and implanted in its mother's or a substitute womb for the nine month term of gestation. Gaylin, *supra* note 91, at 48. *See also* G. LEACH, *supra* note 98, at 96.

One author has gone so far as to suggest that a government might be forced into a program of state controlled cloning in order to compete with a despotic enemy using cloning to produce more rugged soldiers, more brilliant scientists, and more skilled workmen. G. TAYLOR, *supra* note 97, at 26. *But see* G. LEACH, *supra* note 98, at 94-95 (criticizing Taylor's suggestion as unrealistic). *See generally* Fletcher, *Ethical Aspects of Genetic Controls,* 285 N. ENG. J. MED. 776 (1971).

[101] *See* D. RORVIK, *supra* note 96, at 109. Because women could contribute body cells as easily as men, every offspring could be a cloned female. The same woman could donate the egg cell, contribute the body-cell nucleus, and carry the baby to term, achieving a monopolization of the entire reproductive process. *See id.* at 114.

[102] *See* G. TAYLOR, *supra* note 97, at 29. When human eggs are formed they receive from the parent cells only a half complement of chromosomes, which are the structures carrying the genetic message; the same occurs when sperm are manufactured. Consequently, when egg and sperm fuse, the full complement of chromosomes then is present. Offspring thus receive genetic instructions from both parents. When eggs develop, in contrast, they have only half the normal number of chromosomes. In complex organisms, this condition often is sufficient to abort development of the embryo. Egg cells may be stimulated into doubling themselves, without sperm fertilization, however, by jolting them with chemicals or even by pricking them with a pin. The offspring formed is not genetically identical to its mother because the unfertilized sex cell is haploid. A cloned cell, which results from a body cell and not a germ cell, suffers no such handicap. The problem of how to nurture a cloned cell, or the artificially launched egg, soon may be resolved completely as a consequence of new techniques in artificial ovulation. *See id.* at 30-32.

[103] *See id.* at 30.

[104] *See* D. RORVIK, *supra* note 96, at 95 (mice); G. TAYLOR, *supra* note 97, at 29 (frogs).

implanted in her womb for gestation and ultimate birth, all without physical contact with man sexually or with his sperm artificially.[105]

Not enough is known, either technically or ethically, about human cloning or parthenogenesis to allow dogmatizing concerning whether it should or should not be undertaken.[106] Present standards of medical ethics require that a researcher be reasonably confident about the outcome of his research, that he undertake research for reasonably humanitarian purposes, and that he obtain the informed consent of the research subjects.[107] These factors do not force the conclusion that cloning is or is not proper. If the rate of pollution of the human gene pool continues to increase through uncontrolled sexual reproduction, however, efforts to produce healthier people may be required to compensate for the spread of various genetic diseases.[108] In that event, one could make a strong ethical argument to justify cloning of healthy individuals on the ground that it could achieve the greatest good for the greatest number.[109]

Legislation that embodies positive eugenics concepts by permitting only individuals with superior genetic endowments to clone raises a serious constitutional issue. Such a statute would require safeguards against the large scale cloning of particular types of individuals. To do otherwise would decrease the genetic variation that is so vitally necessary to natural selection[110] and would even threaten man with his own eventual extinction.[111] By discriminating between those with superior genetic traits and all others, however, legislation of this nature would be subject to equal protection challenges. Under standard equal protection analysis, if a court determined that the statute affected a fundamental right, the state would need to show that the legislation served a compelling state interest.[112] The right to procreate is a fundamental right,[113] but the denial of cloning methods to individuals who are capable of reproducing in the normal manner may not be a sufficient infringement of this fundamental right to trigger the compelling interest requirement.[114] If it were not

---

[105] *See* D. RORVIK, *supra* note 96, at 94.

[106] *See* Lederberg, *Genetic Engineering or the Amelioration of Genetic Defect*, 34 PHAROS 9, 12 (1971).

[107] *See id.* at 12.

[108] Fletcher, *supra* note 100, at 779. Gene therapy, or the cure of hereditary diseases by transplanting negative, defective genes with stronger ones, appears to be "far in the future." McElheny, *Gene Transplant is Still Remote*, N.Y. Times, May 16, 1975, at 74, col. 5 (quoting Dr. John Morrow of the Carnegie Institution).

[109] Fletcher, *supra* note 100, at 779.

[110] Note, *supra* note 100, at 560.

[111] *Id.* at 561.

[112] *Id.* at 550, 556.

[113] Skinner v. Oklahoma, 316 U.S. 535, 541 (1942).

[114] *See* Note, *supra* note 100, at 550-52.

such an infringement, the state would be required only to show a rational relation between the legislation and a legitimate state interest.[115] A court might determine that the state's interest in the propagation of superior traits is constitutionally impermissible because it violates the Constitution's nobility clause or the thirteenth amendment's prohibition of involuntary servitude.[116] If a court determined that the state has a legitimate interest in the propagation of superior traits, it probably would find that the legislation is rationally related to that purpose.

Persons who carry recessive debilitating traits might succeed in claiming that permitting only genetically superior people to clone infringes their right to procreate; that claim would trigger strict judicial scrutiny of the cloning law, requiring the state to show a compelling interest.[117] Under that scrutiny, at least two attacks on the statute could be made in addition to challenging the state's purpose as constitutionally impermissible. It is doubtful whether scientific evidence can provide a rational basis for a classification of individuals having superior genetic traits.[118] Moreover, the state may be able to achieve its objective through a less intrusive program: its interest in the propagation of superior traits through a positive eugenics program is probably less compelling than its interest in the diminution of inferior traits through a negative eugenics program.[119]

THE LEGAL RESPONSE

The social and legal complexities of biomedical research raise issues that must be resolved. Courts cannot refuse to confront these issues or the law may become immobilized or estranged from science.[120] To deal adequately with these issues, courts must educate themselves in

---

[115] *Id.* at 556; *see* Shapiro v. Thompson, 394 U.S. 618, 638 & n.20 (1969).

[116] *See* Skinner v. Oklahoma, 316 U.S. 535, 581-82 (1942); U.S. CONST. art. I, § 9, cl. 8; *id.* amend. XIII.

[117] *See* Skinner v. Oklahoma, 316 U.S. 535, 556 (1942).

[118] *See id.* at 579.

[119] *See* Vukowich, *supra* note 10, at 222. If the challenged legislation incorporated negative, rather than positive, eugenic concepts so that it only restricted carriers of recessive debilitating defects from cloning, the constitutional problems would be minimized. The legitimacy of the state interest could not be challenged on the ground that it creates an elite group and therefore violates the nobility clause. *See* Note, *supra* note 100, at 581-82. A court readily could find that the statute is rationally related to a legitimate state interest diminishing the propagation of inferior traits. Scientific evidence more readily can provide a rational basis for the classification of those carrying debilitating defects than for those possessing superior genetic traits. *See* Vukowich, *supra* at 198-201. Whether the state's interest in a negative eugenics program is sufficiently compelling to sustain the statute under the strict scrutiny test, however, is uncertain. *See id.* at 208.

the research being conducted and its potential applications; their failure to develop this knowledge fully will result in a chaotic patchwork of decisions, each based on a consideration of only a limited aspect of a particular biomedical technique. Legislative consideration of these issues should begin soon to give courts guidance.[121] Legislation dealing with specific techniques that remain largely unexplored, such as *in vitro* fertilization and cloning, is premature because the available options are unknown.[122] As scientific knowledge of these techniques expands, however, the states can be expected to draft appropriate legislation to protect the health, safety, and welfare of their citizens.[123] The role of the federal government at this stage will be limited to using its taxing and spending powers to condition the grant of federal monies on incorporation of minimum technological standards into state statutes.[124]

A review of the judicial and legislative treatment of family law issues arising from use of artificial insemination (AID) will help illustrate the type of challenges that will confront the more exotic methods of reproduction and will suggest the appropriate legal response; *in vitro* fertilization and embryo implantation raise few issues of family law that AID has not raised already.[125] Until recently, the law treated a child born by AID as the child only of its mother, not that of the mother's husband or putative father.[126] In *Gursky v. Gursky*,[127] for example, a New York trial court held that even though a husband consents to his wife's use of AID the child is

---

[120] *See* Louisell, *supra* note 100, at 3.

[121] *See* Tunney & Levine, *Genetic Engineering*, SATURDAY REV., Aug. 5, 1972, at 24-28. Senator Tunney lists several considerations necessary to effective legislative action: whether a technique or technology assists individual needs or should be designed for a greater societal good; whether there is a real difference between social genetic engineering and individual gene therapy; how the words normal, abnormal, health, disease, and improvement should be defined; whether research for genetic improvement should be of a continuous nature or should be confined to a single generation; and to what degree genetic engineering would affect the diversity among men. *Id.* at 24-26. *See also* Gaylin, *Symposium—The Law and the Biological Revolution*, 10 COLUM. J.L. & SOC. PROBS. 47, 48 (1973) (in attempt to anticipate possible legal problems, law students at Columbia University have developed a Surrogate Mothers Act, Uniform Human Gamete Storage Act, Uniform Controlled Fertilization Act, and General Utilization of Tissue Statute).

[122] Grad, *New Beginnings in Life—A Lawyer's Response* in THE NEW GENETICS AND THE FUTURE OF MAN 75-76 (M. Hamilton ed. 1972); Grad, *Legislative Responses to the New Biology: Limits and Possibilities*, 15 U.C.L.A.L. REV. 480, 485 (1968).

[123] *See* Grad, *Legislative Responses*, *supra* note 122, at 485.

[124] *See id.* at 485-86.

[125] *Id.* at 501; *see* Smith, *supra* note 13, at 134-42 (discussion of AID and adultery, illegitimacy, and inheritance).

[126] Smith, *supra* note 13, at 134-45.

[127] 39 Misc. 2d 1083, 242 N.Y.S.2d 406 (Sup. Ct. 1963).

illegitimate.[128] In *People v. Sorenson*[129] the California Supreme Court rejected the approach of *Gursky* and held that a husband who consents to his wife's use of AID cannot disclaim his lawful fatherhood of the child for the purposes of child support.[130] The court construed the penal nonsupport statute to incorporate liability for a consenting father of the AID child, finding a genetic relationship unnecessary to establish the required father-child relationship.[131]

Since the *Sorenson* decision, several states have passed legislation legitimizing the offspring of AID when the husband consents to the procedure.[132] These developments indicate that courts no longer equate AID with adultery, and they may signal the public's willingness to sanction more startling genetic developments.[133]

Those who oppose legitimization of the newer reproductive methods might make two interesting sociological objections: that separation of sexual love from procreation leads to depersonalization of the marriage bond, and that the biological family unit is the one most likely to provide the proper motivation for child rearing.[134] The first argument does not distinguish the newer methods of reproduction from AID since they all separate sexual love from procreation. This threat has not stopped legislatures and courts from sanctioning AID procedures. The second argument, which raises the importance of maintaining genetic continuity in the lineage of the family,[135] does separate AID from the newer methods of reproduction since these methods do present a possibility of genetic discontinuity.

The child resulting from AID can be the genetic child of the mother but not that of the father. The newer methods of reproduction, *in vitro* fertilization, embryo implantation, cloning, and

---

[128] *Id.* at 1088-89, 242 N.Y.S.2d at 411-12 (although consent does not vitiate wife's adulterous act, husband liable for support on implied contract or equitable estoppel grounds).

[129] 68 Cal. 2d 280, 437 P.2d 495, 66 Cal. Rptr. 7 (1968).

[130] *Id.* at 283-84, 437 P.2d at 498, 66 Cal. Rptr. at 10. The court expressly left the issue of legitimacy unanswered, however, suggesting it should be dealt with by the legislature. *Id.* at 284, 437 P.2d at 501, 66 Cal. Rptr. at 13. *See also* Smith, *Artificial Insemination—No Longer a Quagmire,* 3 FAM. L.Q. 1, 1-2 (1969); Smith, *For Unto Us a Child is Born—Legally,* 56 A.B.A.J. 143, 144 (1970).

[131] 68 Cal. 2d at 284, 437 P.2d at 498-99, 66 Cal. Rptr. at 10-11.

[132] *See, e.g.,* CAL. CIV. CODE § 216 (West Supp. 1975); GA. CODE ANN. § 74-101.1 (1973); KAN. STAT. ANN. § 23-129 (1974); N.C. GEN. STAT. § 49A-1 (Supp. 1975); N.Y. DOM. REL. LAW § 73 (McKinney Supp. 1975); OKLA. STAT. ANN. tit. 10, § 552 (Supp. 1975). *See also* ARK. STAT. ANN. § 61-141(c) (1971) (AID child is intestate taker of husband).

[133] *See* Grad, *Legislative Responses, supra* note 122, at 490.

[134] *See* Note, *supra* note 100, at 502-03.

[135] *See id.*

parthenogenesis, all could be used to create children who also are the genetic children of one of the parents but not the other. Perfection of *in vitro* fertilization and embryo implants also will allow the birth of a child who is neither the genetic child of the woman who bore him nor that of her husband; the ovum and sperm of donors can create an embryo that is later implanted in another woman.[136] Cloning of persons outside of the marriage partners and developing a donor's ovum parthenogenetically would result in similar genetic discontinuity.

To the extent that newer reproductive techniques do not differ significantly from AID, family law should treat the two similarly; these techniques eventually will allow a more significant departure from the traditional family concept, however, and the law should be ready to respond to new legal problems.[137] Statutory legitimization of children born as a consequence of artificial insemination, *in vitro* fertilization, ovum or embryo implantation, cloning, or parthenogenesis would resolve the basic family law problems that the New Biology will create.[138] Such legislation would bring a radical new dimension into the concept of the traditional family. One reason for society to approve such a change in the concept of marriage will be to allow a couple who for physical or professional reasons cannot have children without artificial or scientific manipulation to bless their marriage with children. To protect the interests of the child, legislation that permits marriage partners to use these techniques following a full and knowing consent provide further that the resulting child is the legitimate child of the consenting marriage partners.[139] "Little else would be needed to establish firmly the mutual responsibilities of the husband, wife, and child, to each other, both with respect to duties of support and the right to inherit."[140]

The reasons for allowing a married couple to give birth to a child by artificial insemination, *in vitro* fertilization, or ovum transplants do not apply when an unmarried women seeks to have a child; the unmarried woman cannot assure her child a typical family environment.[141] If this argument is convincing, legislation prohibiting physicians from performing these procedures for the unmarried

---

[136] Grad, *Legislative Responses*, *supra* note 122, at 502.

[137] *Id.* at 502-03.

[138] *See id.* at 506-07. Statutes that legitimize issue born of consensual AID procedures also force a reconsideration of established tenets of the laws of inheritance that normally define the issue for inheritance purposes as meaning "issue of the loins." *Id.* at 507. Such a reconsideration would be useful and could be accomplished without major difficulty.

[139] *Id.*

[140] *Id.* at 509.

[141] *Id.* at 506.

effectively could limit their use to married couples.[142] The liberalization of certain state adoption laws that now permit single individuals to adopt children[143] and the growing recognition of the liberation of women, however, raise doubts about the rationale of such a prohibition. A society that accepts the spirit of female liberation that motivates some women to conceive with no wish for formalized family relationships or ties should allow a single woman who does not conceive because of physical inabilities or professional interests to conceive with bioengineering techniques. The "Do Your Own Thing" philosophy of the 1970s would embrace such preferences of a single woman.[144]

Once the public accepts AID and other techniques of the New Biology, the incorporation of positive eugenic principles into these procedures should not be objectionable.[145] Although mandatory mating for eugenic purposes is patently offensive, using genetically superior semen or ova in the application of these techniques should be viewed favorably. "The use of frozen semen or frozen ova from long-dead men and women whose genetic heritage should not be lost would involve an interesting variation . . . ."[146] Before implementing positive eugenic methods, however, society must grapple with the moral dilemmas resulting from their implementation and then, hopefully, develop a carefully formulated decisionmaking process to determine which programs will benefit society as a whole. The need for a social system for controlling biomedical research and its application comes into conflict with the traditional notion that scientists alone should make those decisions and raises a fundamental ethical issue: who decides?

THE SCIENTIFIC METHOD AND THE NEW BIOLOGY: AN OVERVIEW

By promoting changes in knowledge that force a reexamination of the ideals, principles, and methods men employ in deciding between alternative moral claims, scientific developments can disrupt and bring

---

[142] Artificial insemination of unmarried women may be more difficult to regulate than the other modes of reproduction because medical expertise is not required to perform the procedure. *See id.* at 506.

[143] *See* N.Y. DOM. REL. LAW § 110 (1964); 2 AM. JUR. 2d, *Adoption* § 10 (1963).

[144] A Harris poll conducted in 1969 that surveyed attitudes toward the New Biology throughout the country found that 19 percent approved the use of AID and 56 percent disapproved; 35 percent approved the use of AID, however, assuming it was the only means by which a married couple could have a child. *See* Smith, *For Unto Us a Child is Born*, *supra* note 130, at 143.

[145] Grad, *Legislative Responses*, *supra* note 122, at 508.

[146] *Id.*

into dispute a system of moral values and commitments.[147] The striking incompatibilties between more traditional moral standards and alternative standards supported by significant advances in knowledge can lead to general social anxiety.[148] To ease that anxiety, the reflective man confronts three tasks: to clarify the "bearing of trends in scientific inquiry upon pervasive conceptions of man's place in nature;" to make "explicit the intellectual methods by which responsibly held beliefs are achieved;" and to "interpret inherited beliefs and institutions in the light of current additions to knowledge . . . in order to exhibit the enduring wisdom which may be embodied in them."[149] The freedom of moral decisionmaking carries with it a burden of considerable dimension, since only men can choose the ends to which they will direct scientific research.[150]

The possibilities of biomedicine are just beginning to challenge society's moral standards. New scientific developments will allow man to achieve many goals, but someone must make the value judgments of which goals are proper, based on an ethical standard.[151] Who will exercise those judgments is a threshold question. Individual moral dilemmas may not stand in the way of scientists,[152] but a collective moral dilemma confronting society as a whole may halt research or redirect it towards another goal.

The current debate over the limits of experimentation with genetic engineering focuses on this issue of how much power society should exercise over scientific research decisions. Currently, society does not join in that decisionmaking; scientists make research decisions without public involvement. Moreover, the only guide for scientists is an international code of ethics for clinical research[153] accepted by numerous American professional medical societies, including the American Medical Association.[154] Neither that code, nor the first international attempt to develop standards for scientific research, The

---

[147] E. NAGEL, SOVEREIGN REASON 297 (1954). Professor Ayer has cautioned that "moral judgments are emotive rather than descriptive; they are persuasive expressions of attitudes and not statements of fact—consequently they cannot be either true or false." Ayer, *On the Analysis of Moral Judgments*, in A MODERN INTRODUCTION TO ETHICS 545 (M. Munitz ed. 1958).

[148] E. NAGEL, *supra* note 147, at 297. *See generally Ethical Aspects of Experimentation with Human Subjects*, 98 DAEDALUS 219-594 (1969) (symposium).

[149] E. NAGEL, *supra* note 147, at 297-98.

[150] *See* R. HARE, FREEDOM AND REASON 3 (1963).

[151] *See* Kass, *The New Biology: What Price Relieving Man's Estate*, 174 SCIENCE 779, 781 (1971).

[152] Rose & Rose, *The Myth of the Neutrality of Science*, in THE SOCIAL IMPACT OF MODERN BIOLOGY 215, 219 (W. Fuller ed. 1971).

[153] Declaration of Helsinki, 1964, *reprinted in* Ratnoff & Smith, *Human Laboratory Animals: Martyrs for Medicine*, 36 FORDHAM L. REV. 673, 680-81 (1968).

[154] *See* Ratnoff & Smith, *supra* note 153, at 681.

Nuremberg Code,[155] imposes any radical principle on the medical researcher; each only restates a general standard of conduct, primarily imposing responsibility on the researcher for his subjects' safety.[156]

Several alternatives to the present method of self-regulation exist. Recognizing the inadequacy of self-imposed and sometimes artificial moral burdens on scientists, some scholars have suggested that scientists should share decisions concerning genetic research with the public.[157] The American public's ability to understand and analyze the complex decisions that would be thrust upon them under this proposal is doubtful, however, suggesting the need for a different alternative. Perhaps the most satisfactory way to resolve the rather troubled relationship between ethics and life sciences is to promote total cultural revision, or revolution, rather than to focus on individual normative behavior.[158] The development of a contemporary and "fresh" ethic for the life sciences would require an attempt to build a new culture where all people work for common ends, share binding visions, and agree on a set of shared values.[159] That ideal provides no direction for the immediate ethical problems posed by the New Biology. A more practical means of assuring society's participation in basic research decisions would operate by exerting influence on the sources of funding. The dependence of genetic research on federal funds in particular suggests the leverage society could exert to force scientists to break with tradition and seek society's support for their research.

NEW AVENUES OF REGULATION: THE FEDERAL GOVERNMENT ACTS

The federal government already has taken steps to regulate medical research programs supported by federal funds. In 1966 the Surgeon General announced that the United States Public Health Service, a division of the Department of Health, Education and Welfare (HEW),

---

[155] *See generally* 2 TRIALS OF WAR CRIMINALS BEFORE NUREMBERG MILITARY TRIBUNALS, THE MEDICAL CASE 181-84 (1950), *reprinted in* Beecher, *Experimentation in Man*, 169 J.A.M.A. 461, 472-74 (1959) (text of Nuremberg Code).

[156] *See* Comment, *Non-Therapeutic Medical Research Involving Human Subjects*, 24 SYRACUSE L. REV. 1067, 1078 (1973). The researcher must be able to justify the use of human subjects after evaluating the risks and potential benefits; additionally, the participants must give a fully informed, voluntary consent. Moreover, the researcher has a continuing affirmative duty to protect his subjects' safety even to the point of terminating the experiment if he has reason to believe the subjects otherwise would be harmed. *Id.*

[157] Rose & Rose, *supra* note 152, at 219.

[158] Callahan, *Search for an Ethic—Living with the New Biology*, 5 THE CENTER MAGAZINE 4 (July-Aug. 1972) (publication of Institute of Society, Ethics & Life Sciences, Hastings-on-the-Hudson).

[159] *Id.* at 6.

would not grant, renew, or continue to support research programs involving humans unless the institution at which the research is being conducted undertakes a review of the risks and potential medical benefits of the research, the rights and the personal welfare of the research subjects, and the need for their informed consent to participate.[160] In 1973 HEW initiated a public dialogue about biomedical experimentation by proposing regulations for the protection of human subjects in federally funded scientific experiments.[161] Final regulations, which became effective July 1, 1974, apply to all HEW grants and contracts supporting research, development, and related activities involving human subjects.[162] Among other provisions, the regulations state that if experimentation may expose research subjects to possible physical, psychological, or social injury, an independent review committee must find that these risks are outweighed by the benefit to the subject and the value of the knowledge to be gained.[163] All subjects must give an informed consent before taking part in the experiment,[164] and any person obtaining an HEW grant or contract monies for research involving human subjects must submit both a written assurance of compliance with HEW policy and a set of implementing guidelines.[165]

Eleven days after the HEW regulations went into effect, Congress established a National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research.[166] Congress directed the Commission, composed of 11 representatives from various fields of professional interest,[167] to identify basic ethical principles for biomedical and behavioral research involving human subjects;[168] the Commission specifically was directed to study risk-benefit criteria in determining the appropriateness of research involving human subjects

---

[160] *See* Curran, *Governmental Regulation of the Use of Human Subjects in Medical Research: The Approach of Two Federal Agencies* in EXPERIMENTATION WITH HUMAN SUBJECTS 402, 436 (P. Freund ed. 1970). *See generally* MEDICAL PROGRESS AND THE LAW (C. Havighurst ed. 1969); Jaffee, *Law as a System of Control,* 98 DAEDALUS 406, 428 (1969).

[161] U.S. Dep't of Health, Educ. and Welfare, Protection of Human Subjects, Proposed Policy, 38 Fed. Reg. 27882 (1973). After public comment, final regulations were adopted on May 30, 1974 to be effective July 1, 1974. 45 C.F.R. §§ 46.1-.22 (1975). *See generally* 39 Fed. Reg. 18914-17 (1974) (summary of public comments). *See also* Martin, *Ethical Standards for Fetal Experimentation,* 43 FORDHAM L. REV. 547 (1975).

[162] *See* 45 C.F.R. § 46.1 (1975).

[163] *Id.* § 46.2(b)(1).

[164] *Id.* § 46.2(b)(3); *see id.* §§ 46.3(c), 46.9, 46.10.

[165] *Id.* § 46.4.

[166] National Research Act, Pub. L. No. 93-348, § 201, 88 Stat. 342, 42 U.S.C.A. § 2891-2 (1974).

[167] The fields represented are: medicine, law, ethics, theology, biology, physical science, behavioral and social science, philosophy, humanities, health administration, and government and public affairs. *Id.* § 201(b), 42 U.S.C.A. § 2891-2(b).

[168] *Id.* § 202(a)(1)(A)(i), 42 U.S.C.A. § 2891-2(a)(1)(A)(i).

and the nature of informed consent in biomedical research.[169] The Commission will make its recommendations to the Secretary of HEW for guidance in developing guidelines for HEW-funded research and to Congress if the need for statutory guidelines for private research arises.[170]

On August 23, 1974, about one month after Congress created the Commission, HEW supplemented its July 1974 regulations with amendments governing biomedical research activities that involve minors, fetuses, abortuses,[171] prisoners, and institutionalized mental defectives.[172] The new regulations also give the Secretary of HEW authority to establish two Ethical Advisory Boards to review biomedical research proposals.[173] Moreover, even after HEW approves a research project for funding, an Institutional Review Board must continue to monitor the project and intervene if necessary.[174] Although these new regulations assure the federal government a role in making decisions concerning scientific experimentation in human research, the Secretary of HEW has adopted the position that it would be contrary to the public interest to impose permanently research restrictions that are based on the successes and limitations of current technology.[175] Without such broad guidelines, the Secretary advised the Ethical Advisory Board to evaluate each proposal involving *in vitro* fertilization in light of "the state of the art, legal issues, community standards, and the availability of guidelines to govern each research situation."[176] The HEW regulations set a standard of care that provides protection for the rights of human subjects at the earliest level of conception, while also providing for the freedom of scientific inquiry that is vital for research in this area. The establishment of an Ethical Advisory Board assures that ethics will be a factor in scientific decisionmaking.

Another HEW sponsored project, the National Commission for the Protection of Human Subjects and Behavioral Research, recently published its report and recommendations.[177] Based on a finding that

---

[169] *Id.* § 202(a)(1)(B), 42 U.S.C.A. 2891-2(a)(1)(B).

[170] *Id.* §§ 202(a)(1)(A)(iii), 202(a)(3), 42 U.S.C.A. §§ 2891-2(a)(1)(A)(iii), 2891-2(a)(3).

[171] Abortuses are fetuses that are expelled whole prior to viability, either spontaneously or as a result of medical or surgical intervention.

[172] 39 Fed. Reg. 30648 (Aug. 23, 1974) (regulations proposed); *see* 40 Fed. Reg. 33526 (Aug. 8, 1975) (adoption of final regulations).

[173] 45 C.F.R. § 46.204 (1975).

[174] *Id.* § 46.205 (intervention "as necessary"); *see id.* § 46.106.

[175] 39 Fed. Reg. 37993 (Oct. 23, 1974).

[176] *Id.*

[177] NATIONAL COMMISSION FOR THE PROTECTION OF HUMAN SUBJECTS OF BIOMEDICAL AND BEHAVIORAL RESEARCH, REPORT AND RECOMMENDATIONS—RESEARCH ON THE FETUS, (DHEW Publication No. (05) 76-127, 1975) [hereinafter cited as COMMISSION REPORT AND

human fetal research in the past has assisted in saving thousands of lives that otherwise would have been lost,[178] the Commission encouraged therapeutic research directed toward the fetus or its mother without the imposition of complex safeguards.[179] In addition, the Commission called for the repeal of the present HEW moratorium on federally funded medical research involving fetuses *in utero*.[180]

The Commission's specific recommendations establish useful guidelines. Nontherapeutic fetal research undertaken in anticipation of abortion would be allowed if the research were consistent with recommended guidelines for all other nontherapeutic research,[181] but a national ethical review board should review special problem cases.[182] Nontherapeutic *ex utero* fetal research might be permitted, following abortion, if three conditions are met: the fetus is less than twenty weeks old, the mother gives an informed consent, and the

---

RECOMMENDATIONS]; *see* 40 Fed. Reg. 33547 (Aug. 8, 1975) (text of Commission recommendations).

[178] COMMISSION REPORT AND RECOMMENDATIONS App. 15-1 to 15-2 (study of the Columbus-Battelle Laboratories). The conclusions focus on four major medical achievements aided by fetal research: treatment of the Rh hemolytic diseases; the development of a vaccine for rubella; the treatment of newborn humans with respiratory distress syndrome; and development in amniocentesis. *See id.* at 15-9 to 15-96. *See also* Schmeck, *Report on Human Fetal Studies Finds Work Saved Thousands,* N.Y. Times, Mar. 15, 1975, at 20, col. 1.

[179] *See* COMMISSION REPORT AND RECOMMENDATIONS 73 (Recommendations 1 and 2); 40 Fed. Reg. 33547 (Aug. 8, 1975).

[180] *See* COMMISSION REPORT AND RECOMMENDATIONS 76 (Recommendation 16); 40 Fed. Reg. 33548 (Aug. 8, 1975). *See also* 39 Fed. Reg. 30962 (Aug. 27, 1974) (HEW moratorium). The ban, although limited to HEW funded research, effectively stifled all fetal experimentation in the United States because of scientific researchers' heavy dependence on federal support. *See* Schmeck, *supra* note 178, at 20, col. 1.

In its final regulations, adopted after the Commission issued its report, HEW lifted its ban, providing, among other things, that *in utero* fetal research may be conducted only if required to meet the health needs of the fetus or if the risk to the fetus is minimal and important biomedical knowledge cannot be obtained by other means. 45 C.F.R. § 46.208(a) (1975); *see* 40 Fed. Reg. 33526 (Aug. 8, 1975) (secretary's statement approving final regulations).

Interestingly, the NIH held two days of hearings recently to consider research rules involving recombinant DNA, as the transfer of genes from one organism to another is called. Research in this area has been at a standstill since July 1974, when a small group of prominent molecular biologists suggested that no experiments be done with this type of genetic engineering until all the risks could be assessed. *See* NIH, PROPOSED GUIDELINES FOR RESEARCH INVOLVING RECOMBINANT DNA MOLECULES (1976); Powledge, *The Genetic Engineers Still Await Guidelines,* N.Y. Times, Feb. 15, 1976, § E, at 8.

[181] *See* COMMISSION REPORT AND RECOMMENDATIONS 74 (Recommendation 5); 40 Fed. Reg. 33548 (Aug. 8, 1975). *See also* Schmeck, *Members of Panel on Fetal Research Object to Several of its Recommendations,* N.Y. Times, May 21, 1975, at 31, col. 4. Nontherapeutic research is research that does not directly aid the individual involved; the purpose of such research is to strengthen the health of persons in that same affinity group or category.

[182] *See* COMMISSION REPORT AND RECOMMENDATIONS 74 (Recommendations 5 and 6); 40 Fed. Reg. 33548 (Aug. 8, 1975).

father does not object.[183] HEW also should require an assurance not only of the value of the anticipated research but also of the inability to achieve the research goals by alternative means.[184] These rather stringent restrictions will serve to reduce to a minimum any risks or indignities to the research subjects.[185] Most of the fetal research currently being conducted by American scientists, however, would not be affected by these standards because researchers presently comply with the guidelines.[186]

The Commission's recommendations satisfactorily balance the need for continued scientific research in the area and the need for an ethical standard of guidance.[187] Although limited to HEW funded research, the recommendations and the accompanying HEW guidelines provide a basis for structuring a uniform standard of scientific research. An international and interdisciplinary inquiry into the ethical considerations surrounding biomedical research could build on these recommendations to develop a broader research standard.

ETHICAL TRIBUNALS IN NONGOVERNMENTAL AREAS

The concept of an ethical tribunal, embodied in the HEW regulations governing biomedical research with human subjects, could easily be incorporated into the procedures governing privately funded research in this area.[188] The Clinical Pathological Conferences, which already are an integral part of major hospital post-mortem procedures, could serve as an ethical tribunal for private research.[189] At these conferences, the clinician who administered to the needs of the diseased patient describes his diagnosis, its rationale, and the therapy he prescribed, and the pathologist presents the post-mortem findings. This process reveals to the clinician any errors in his judgment or the astuteness of his diagnosis.[190] Introduction of an ethical review of the research by adding a third panel member would entail little difficulty.[191]

The most perplexing dilemmas, with imposing ethical consider-

---

[183] *See* COMMISSION REPORT AND RECOMMENDATIONS 74 (Recommendation 6); 40 Fed. Reg. 33548 (Aug. 8, 1975).

[184] *See* COMMISSION REPORT AND RECOMMENDATIONS 74 (Recommendation 6); 40 Fed. Reg. 33548 (Aug. 8, 1975).

[185] *See* COMMISSION REPORT AND RECOMMENDATIONS 68-69.

[186] *See* Schmeck, *Some Research on Human Fetus Backed in Report,* N.Y. Times, Apr. 12, 1975, at 55, col. 1.

[187] *See generally* P. RAMSEY, THE ETHICS OF FETAL RESEARCH (1975).

[188] See Dagi, *The Ethical Tribunal in Medicine,* 54 B.U.L. REV. 268, 274-77 (1974).

[189] *Id.* at 275.

[190] *Id.*

[191] *Id.*

ations, arise in human experimental research, not in therapeutic treatment. The selection and composition of the members of an ethical tribunal that would consider prospective action and the determination of the nature and extent of its responsibility pose serious questions.[192] Should a tribunal be composed completely of doctors, or should an ethicist, philosopher, general member of the community, or atheist be included? The composition of each tribunal could be tied to the nature of the research to assure that the personnel composition of the tribunal would change and that each panel could have a different philosophical disposition for each new research problem. Under this proposed structure, a tribunal could approach a cancer research problem differently from a fetal research problem. Whether any tribunal reviewing private research would be legally liable for its judgments is doubtful, but each member would clearly be morally responsible for the consequences of his actions.[193]

FINDING AN EQUILIBRIUM

Government regulation, international codes of ethical behavior, and rules of internal hospital administration are limited in their attempt to set standards for scientific research in genetic engineering. In the final analysis, the private researcher charts the course of scientific investigation. He will determine the balance between freedom of scientific inquiry and concepts of what is socially good; he will determine whether his research should be totally utilitarian, providing the greatest good to the greatest number even if it may compromise the rights of some individuals, and how his research should accommodate the competing interests of each subgroup in society. The system of self-regulation would be workable, of course, if scientists accepted the fundamental principle that their research must promote the social good by seeking to minimize human suffering for the greatest number; that principle would provide adequate ethical guidance for research decisions.[194] This general standard appears to favor independent scientific study since the research scientist determines both the definition of the social good that the experimentation will promote and the beneficiaries of that research. The standard is based on a broader conception, however, in that it seeks to minimize mental, physical, social, and spiritual suffering throughout the human community. The standard therefore would

---

[192] *Id.* at 276.

[193] *Id.*

[194] *See* Pauling, *supra* note 8, at 270; *cf.* Greenawalt, *supra* note 24, at 50-51 (definition of concept "social good" in abortion context).

allow a scientist to undertake *in utero* or *in vitro* fetal research to produce children free from debilitating recessive hemophilic or sickle cell genes because successful research ultimately would benefit parents and prospective parents and their offspring by eliminating suffering and also would benefit society by making available for others research resources otherwise allocated to maintain the genetically defective.

Because this ethical standard is future-oriented, one could argue that it does not adequately concern itself with present human suffering. As a branch of applied science, genetics is directed toward the study of the evolutionary aspects of heredity and reproduction, while other branches of medical science exist in part to treat the present infirmities of the genetically inferior. Genetic manipulation holds a hope for the future, not a cure for the present, and this prospective character complicates the ethical considerations.

THE BIOETHICAL CONUNDRUM: A CONSIDERATION IN MICROCOSM

THE INTERACTION OF SCIENCE AND ETHICS

Bioethics attempts to develop a philosophy regarding the application of man's biological knowledge in furtherance of the social good.[195] Several philosophers have attempted to structure a general system of bioethics. For Teilhard de Chardin, the "Omega Point," that cultural stage that will occur in the evolutionary process where "the minds of men attain a common language of scientific humanism,"[196] was a workable philosophy.[197] Darwin constructed a general ethic dependent on a "scientific-philosophic" concept of progress.[198] One contemporary scholar has stated that Darwin's concept rests on several premises regarding knowledge; Darwin apparently assumed that the limits of knowledge are infinite, that no single individual can begin to encompass the knowledge that presently exists, that the only effective solution to what may be termed dangerous knowledge is more knowledge, and that knowledge should be disseminated as widely as possible. Indeed, to Darwin, wisdom, the knowledge of how to use knowledge, was by far the most important knowledge of all.[199]

Whether one defines wisdom in Kantian terms, as policy of action

---

[195] V. POTTER, BIOETHICS: BRIDGE TO THE FUTURE 26 (1971). *See generally* T. DOBZHANSKY, GENETIC DIVERSITY AND HUMAN EQUALITY (1973); R. PAOLETI, SELECTED READINGS: GENETIC ENGINEERING AND BIOETHICS (1972).

[196] V. POTTER, *supra* note 195, at 34.

[197] *Id.* at 31.

[198] *Id.* at 45-46.

[199] *Id.* at 49.

that espouses "doing or letting be," or as Darwin did, as the knowledge of how to use knowledge, the principal focus of wisdom is society's competence to act.[200] Moreover, this problem of how society should use knowledge for the social good must be considered in terms of the total volume of information that society can manipulate:[201]

> [M]oral status (our ethical integrity) depends upon two things at least: first, freedom of choice, and, second, knowledge of the facts and of the courses between which we may choose. In the absence of either or both of these things we are, in the forum of conscience, more like puppets than persons. Lacking freedom and knowledge, we are not responsible; we are not moral agents or personal beings. . . . mankind is constantly growing and gaining ground both in knowledge of life and health and in human control over them. This is, indeed, the same as saying that the *means* to heightened moral stature are available. The appeal of moral idealism is that we take advantage of every opportunity to grow in wisdom and stature, that we *assume* our responsibility; in short, that we act like human beings.[202]

Human beings ideally will act with rational purpose and design in addressing the ethical problems of biomedical research. Some urge a cessation of all research, observing that we lack total knowledge.[203] Significant dangers do exist in undertaking research and in applying the fruits of that research,[204] and man often chooses the path of ignorance to escape the burdens of responsibility that arise from new knowledge. To end research now, however, will foreclose any opportunity to grow in wisdom and use that wisdom to act with dignity and responsibility. Since man cannot escape responsibility, we should continue research in the New Biology and increase the public debate over the social and legal consequences arising therefrom.[205]

Ethical and scientific factors continuously interact as the scientific process creates new possibilities that influence ethical judgments.[206] The set of values and ordering of commitments to which the scientist

---

[200] *Id.* at 184-86.

[201] *Id.* at 186.

[202] J. FLETCHER, MORALS AND MEDICINE 35 (1960) (emphasis in original) (footnote omitted).

[203] Watson, supra note 100, at 52-53; *see* Green, *Genetic Technology: Law and Policy for the Brave New World,* 48 IND. L.J. 559, 576-80 (1973); Kass, *supra* note 151, at 786-87.

[204] *See* Friedman, *Interference with Human Life: Some Jurisprudential Reflections,* 70 COLUM. L. REV. 1058, 1076 (1970).

[205] *Id.* at 1077. *See generally Symposium—Morals, Medicine and the Law,* 31 N.Y.U.L. REV. 1157, 1161-1245 (1956).

[206] *See* Shinn, supra note 25, at 308-09. *See generally* P. RAMSEY, FABRICATED MAN: THE ETHICS OF GENETIC CONTROL 2-22 (1970); Shinn, *Perilous Progress in Genetics,* 41 SOC. RESEARCH 83, 94-103 (1974).

ascribes influences not only the research objectives he seeks but also the results he can recognize.[207] Science is descriptive and attempts to resolve the question: What is? Ethics is prescriptive and attempts to resolve the question: What ought to be?[208] Paradoxically, the law is charged with structuring a standard for present behavior and simultaneously remains a step behind science in a reaction capacity.[209] Exclusive reliance should not be placed on legal remedies, however, to resolve the complex ethical problems that biomedical research presents.[210] Indeed, the law should probably not support any one particular scientific ethic, however styled.[211]

Much of the ethical theory surrounding biomedicine attempts to harmonize individual desires with the greater social welfare.[212] Moral dilemmas in biomedicine may be thought of as arising from real or apparent conflicts between perceived obligations to distant generations and to the present generation.[213] In determining whether continued investigations into genetic engineering will jeopardize future life, one should inquire whether an act with uncertain consequences would be harmful to one's own children.[214] Man should not inflict on future generations that which can be disastrous to a present generation.[215]

One scholar has suggested a bioethical creed for individuals. The creed states that "the future survival and development of mankind, both culturally and biologically, is strongly conditioned by man's present activities and plans."[216] The creed encompasses a corresponding commitment to live life and influence the lives of others to promote the evolution of a better world for future generations by avoiding actions that would detrimentally impact the future.[217]

---

[207] Friedman, *supra* note 204, at 1077.

[208] Fletcher, *supra* note 100, at 776.

[209] Burger, *Reflections on Law and Experimental Medicine*, 15 U.C.L.A.L. REV. 436, 439 (1968).

[210] Grad, *New Beginnings in Life—A Lawyer's Response*, in THE NEW GENETICS AND THE FUTURE OF MAN 77 (M. Hamilton ed. 1972).

[211] *Id.*

[212] *See generally* A. CAMPBELL, MORAL DILEMMAS IN MEDICINE 1-14 (1972); Leake, *Changing Concepts in Medical Morals*, 37 CONN. MED. 139, 140 (1973).

[213] Golding & Callahan, *What Obligations Do We Have to Future Generations?*, 164 AM. ECCLESIASTICAL REV. 265, 275 (1971).

[214] *Id.* at 279.

[215] *Id.* at 279-90.

[216] V. POTTER, *supra* note 195, at 196.

[217] *Id.* One author maintains, however, that one cannot argue, solely on the basis of reason, that the survival of mankind should be promoted; if religious convictions are set aside, it cannot be shown that the indefinite continuation of the human species is desirable. R. Heilbroner, *What Has Posterity Ever Done For Me?*, N.Y. Times, Jan. 19, 1975, Magazine, at 14.

THE METAETHICAL QUAGMIRE

Metaethics examines specifically how normative standards should be structured and what the standards should be for applying genetic rules of research and development to future generations.[218] A uniform core of standards is needed. Individual judgments of scientists, which have proven faulty and inadequate,[219] should be replaced by an ethic that assures collective social responsibility.[220] An a priori ethic, which rests on the faith that certain acts are inherently immoral,[221] does not meet this requirement. A pragmatic ethic, which requires that one make choices that offer a maximum of desirable consequences,[222] does seem to fulfill the goal of collective responsibility. If the results of biomedical research will contribute to human well-being, a practical ethic would sanction the research.[223]

Two types of pragmatic ethics exist within the general category: rule utilitarianism and case utilitarianism. Rule utilitarians stress the need for a weighing of the good that an entire class or category of experiments, such as reproduction in the laboratory, would produce.[224] If they conclude that the research would not provide sufficient benefits, they would disapprove the entire class or category of experiments.[225] Case utilitarians, on the other hand, would weigh the good that each separate case or situation would provide. Under this ethical approach, laboratory reproduction might be proper in certain cases but improper in others.[226] Either type of a practical ethic is consistent with the need to seek a consensus ethic to guide

---

[218] Callahan, *Normative Ethics and Public Morality in the Life Sciences,* 32 THE HUMANIST 6 (Sept.-Oct. 1972); *See* K. VAUX, BIOMEDICAL ETHICS 51-68 (1974). Metaethical judgments are statements about possible practical judgments, one step removed from actual situations. Such judgments define and appraise the standards, rules, and principles that are sought to justify practical decisions. R. ABELSON, ETHICS AND METAETHICS 4 (1963).

[219] Callahan, *supra* note 218, at 6.

[220] *See* Brody, *Biomedical Innovation, Values and Anthropological Research,* 158 J. NERVOUS & MEN. DISORDERS 85, 85-87 (1974).

[221] Fletcher, *supra* note 100, at 777-78; Fletcher, *New Beginnings in Life* in THE NEW GENETICS AND THE FUTURE OF MAN 81 (M. Hamilton ed. 1972).

[222] Fletcher, *supra* note 100, at 778.

[223] Fletcher, *New Beginnings in Life, supra* note 221, at 86-87.

[224] *Id.* at 82. Utilitarians assert that the right act in any given circumstances is the one act, out of all the possible acts, that, based on available data, will more than likely produce the greatest good. This process reduces ethics to defining good and bad not as means, but as ends. One therefore judges whether any individual action is right by whether the action leads to a happier life for the particular individual. M. MUNITZ, A MODERN INTRODUCTION TO ETHICS 128 (1958). *See also* A. EDEL, ETHICAL JUDGMENT 132 (1955); S. ZINK, THE CONCEPTS OF ETHICS 93-94 (1962).

[225] Fletcher, *New Beginnings in Life, supra* note 221, at 86-87.

[226] *Id.* at 82-83.

biomedical research that is not aligned with humanism, meta rationalism, or assumptions of faith, but is tied solely to a communion of shared values derived from observable experiences.[227] No condemnation of laboratory reproduction would be made pursuant to a consensus ethic unless either the means or the ends of the research were incompatible with human needs[228] or unless a common consent, achieved through verifiable reasoning, required ending the experiment.[229] One scholar has suggested that, in the final analysis, reason together with imagination can produce a "reasonable guess" and that is about all that can ever be done.[230]

The creation of life and the remaking of man frame the ultimate ethical issues resulting from increased genetic knowledge.[231] Genetic modifications are intermediate expressions of this ultimate capacity, and cloning exemplifies the final consequence. To illustrate the issues that an ethical system must resolve in dealing with biomedical technologies, consider the consequences of surrogate motherhood.[232] If donors of sperm have no claim over children born of their sperm through artificial insemination, a donor of an ovum should have no superior rights over the real mother.[233] When a physician seeks to implant an ovum into another woman, he should obtain permission from the donor for the transfer or implant, but what if the donor woman has strong religious or other objections to *in vitro* fertilization that would have led her to refuse permission if she were told that her ova were to be used for that purpose? Even if the doctor has obtained permission to use a donor's ova for *in vitro* fertilization, what happens if, after fertilization, an embryo begins to develop abnormally; who should make the decision to discard or to keep a defective embryo: the donor woman, the desiring couple, the geneticist, the obstetrician, or all of these individuals together?[234] These dilemmas may be upon us rather quickly.

The prospect of producing "optimum babies" introduces another issue that bioethics must resolve. Many people might raise objections to the regulation of life beginning in the laboratory rather than in the

---

[227] *Id.* at 88-89.

[228] *Id.* at 89.

[229] *Id. See also* Gustafson, *Basic Ethical Issues in the Bio Medical Fields,* 53 SOUNDINGS 151, 177 (1970) (maximum possible freedom for research and self-development should be sought, but values must be enunciated as guidelines for future research).

[230] Callahan, *A Philosopher's Response,* in THE NEW GENETICS AND THE FUTURE OF MAN 92 (M. Hamilton ed. 1972).

[231] K. VAUX, BIOMEDICAL ETHICS 51-52 (1974).

[232] *See* Kass, *New Beginnings in Life,* in THE NEW GENETICS AND THE FUTURE OF MAN 35-38 (M. Hamilton ed. 1972).

[233] *Id.* at 37-38.

[234] *Id.* at 34-35.

home. This issue forces consideration of the interests of a new participant, the scientist. To some this depersonalization of the procreative process is most undesirable;[235] human procreation for them "is more complete human activity precisely because it engages us bodily and spiritually as well as rationally."[236] Acts of laboratory procreation may threaten the sanctity of marriage and the human family.[237] A scientific mastery should not drive out a spiritual mystery.

These criticisms of new biomedical research have led some to suggest a professional moratorium on human experimentation with *in vitro* fertilization and embryo transfer until safety procedures are perfected that will safeguard against "the further dehumanization of man."[238] Development of such safeguards could take many forms: studies of the normality of the offspring produced by the technologies of the New Biology among lower order mammals; establishment of intraprofessional organizations to discuss and evaluate work in this area; promotion of interdisciplinary discussion to fully apprise all concerned of the consequences of continued *in vitro* fertilization and embryo transfer research in order to minimize any possible negative social consequences; development of an international forum for full exploration of ways in which misdirections in biomedicine may be averted; and ultimately the creation of ethical guidelines for the application of the New Biology, drawing on the skills of lawyers, legislators, theologians, philosophers,

---

[235] *Id.* at 53-54.

[236] *Id.* at 53.

[237] *Id.* at 54.

[238] Kass, *Babies by Means of In Vitro Fertilization: Unethical Experiments of the Unborn?*, 285 N. ENG. J. MED. 1174, 1178 (1971). Recently, an international conference of biologists structured a set of rules to govern research and experimentation in genetic engineering. Although conceding that there was considerable ignorance concerning the multiple facets of the revolution in molecular biology, scientists from 16 nations recommended that research continue. The conference called for safer biological tools for gene manipulation, however, determining that these tools needed to be tested and thoroughly developed under laboratory conditions before they are used in human experimentation. Two Nobel Prize biologists, Dr. Joshua Lederberg and Dr. James D. Watson dissented from the conference's conclusions on the ground that any "safeguard" is virtually unenforceable because of the difficulty in determining the nature of the exact risk undertaken in specific experiments. McElheny, *World Biologists Tighten Rules on "Genetic Engineering" Work*, N.Y. Times, Feb. 28, 1975, at 1, col. 4.

Dr. Franz J. Ingelfinger, Editor of the New England Journal of Medicine, has observed that existing and proposed new regulations of fetal research may hinder medical progress. "The pendulum swings too far when ethical principles are used to denigrate scientific inquiry and creativity." Altman, *A Medical Editor Discusses Ethics*, N.Y. Times, Apr. 9, 1975, at 15, col. 1. He encouraged medical researchers and ethicists to work together more closely with one another in hospitals, laboratories, and classrooms to minimize unethical experimentation on humans and hopefully narrow the large gap in understanding between the purists in medicine and philosophy. *Id.*

humanists, social scientists, and laymen.[239]

Research into the impact of biomedical technologies and consideration of the ethical dilemmas involved does not require a moratorium on human experimentation; the two can continue concurrently. The new HEW regulations regarding human research, which apply to most of the research proposals in the field, provide sufficient guidelines for new research. The National Commission for the Protection of Human Subjects in Biomedical and Behavioral Research hopefully will continue to present valuable insights into this area and provide guidelines for subsequent research. Formalized standards, such as The Nuremberg Code, also encourage scientists to consider ethical factors and supply helpful benchmarks for research. Society should encourage, not stifle, research; a society unable to accept and encourage either current or future behavioral variations does not promote a hospitable environment for the free development and expression of ideas of any kind.[240] Man cannot learn by merely thinking in this area.

CONCLUSION

Man currently possesses knowledge that permits him to disregard governance by certain biological facts of life. He can alter those facts and can even cite an ethical mandate for such acts:

> We cannot accept the "invisible hand" of blind, natural chance or random nature in genetics.... To be men we must be in control. That is the first and last ethical word. For, when there is no choice, there is no possibility of ethical action. Whatever we are compelled to do is amoral.[241]

The scientific method through which knowledge is revealed is less a set of codified principles than a habit of workmanship that skilled investigators possess.[242] The cultivation and development of an intellectual temper that reveals both the nature of scientific reason and the grounds for continued confidence in it are fundamental conditions for every liberal civilization to achieve.[243]

Controlled breeding through genetic manipulation is not far behind the legalization of artificial insemination.[244] Once public acceptance of AID is achieved, rapid progress will be made in achieving similar

---

[239] Kass, *supra* note 238, at 1178.

[240] *See generally* N. KITTRIE, THE RIGHT TO BE DIFFERENT: DEFIANCE AND ENFORCED THERAPY (1971).

[241] Rorvik, *supra* note 82, at 62 (quoting Dr. Joseph Fletcher).

[242] E. NAGEL, *supra* note 147, at 300.

[243] *Id.* at 308.

[244] Smith, *supra* note 125, at 149.

recognition of other new techniques. The law then will be in a better position to begin to chart a course of action and keep pace with science instead of remaining behind in grappling with the scientific, legal, ethical, and social issues of the Brave New World. Although some assert that eugenic control or controlled breeding is dangerous, foolhardy, destructive of the integrity of the family, and violative of the human right to determine the size of the family unit, the unalterable fact is that population forecasts indicate that the world soon will be overpopulated if appropriate actions are not taken.[245] Genetic planning and eugenic programming are more rational and humane alternatives to population regulation than death by famine and war. Quality of life, in the final analysis, is more important that the sanctity of creation.

If we approach mastery of the genetic code with careful resolve to minimize human suffering and maximize the social good, we will approach the future with assurance that, like Daedalus, we will in fact arrive safely and meet our goal. If we set out with reckless abandon and are driven only by blind instinct, we surely will be corrupted and, like Icarus, fall.

---

[245] *Id.* at 150.