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Book Review

The New Biology: Law, Ethics And Biotechnology†

By George P. Smith, II

Reviewed by Barry S. Reed††

I. Introduction

The New Biology: Law, Ethics And Biotechnology is a collection of recently written essays by Professor George P. Smith, II. Smith's book possesses all the features that would warm the spirits of Rupert Murdoch's front page editors — sex, religion, science fiction, violence, and vast amounts of money. At the same time, he addresses the convergence of the most important ethical, legal, and medical issues that will face mankind both today and well into the next century.

His style is often academic and formal, but it engages the reader in an exercise in logic and reason. His extreme arguments, such as his support for the mass screening and quarantining of AIDS patients,¹ should not confuse the reader. This is Smith's educational style — he more often than not issues a challenge to his students in order to launch an academic and

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1. See GEORGE P. SMITH, *THE NEW BIOLOGY: LAW, ETHICS AND BIOTECHNOLOGY*, ch. 7 (1989) [hereinafter *The New Biology*]. The provocative tone of this book is in keeping with his other major works. See also Buetow, Book Review, 2 J. CONTEMP. HEALTH L. & POL'Y 173 (1986) (reviewing G. SMITH, *MEDICAL-LEGAL ASPECTS OF CRYONICS: PROSPECTS FOR IMMORTALITY* (1983)); *ETHICAL, LEGAL AND SOCIAL CHALLENGES TO A BRAVE NEW WORLD* (1982); and *GENETICS, ETHICS AND THE LAW* (1981)).

thought-provoking exchange. One of his central themes is the need for a dialogue between the disciplines of law, medicine, ethics, and science. He challenges his reader to consider his essays' topics.

In this new treatise, Smith tackles head-on the heavy and complex social, ethical, moral, and political issues in eleven challenging essays. Smith finds numerous opportunities to suggest choices and directions for resolving dilemmas presented by his subject matter. The reader may often disagree with Smith's conclusions and theories, but after reading these essays the reader will have been introduced to a rich collection of references, as well as many provocative ideas.

Another theme central to Smith's essays is the conviction that now is the time for society to begin resolving these complex problems. Analogously, in medicine the time to perform a tracheotomy is when one first thinks of performing the operation, not when the patient is in severe respiratory distress. Although the reader may reach different conclusions on many of the topics raised, such as organ procurement and transplant, eugenics and allocation of medical and financial resources, few will deny the importance of a timely resolution to these problems. By his willingness to consider and evaluate the broad range of dimensions and unpopular themes discussed in *The New Biology*, Smith demonstrates a fullness of scholastic maturity. He writes in a well-balanced style which is easily read and comprehended by the average individual interested and concerned about the various complexities of the New Biology. The copious endnotes provide the more serious-minded reader with a strong research base for further evaluation of the various topics.

In the introduction to this book, Professor Smith posits that the "basic challenge of *The New Biology*" is to essentially maintain a standard of *quality* and *purposeful* living from conception through its natural conclusion. Quality management is in turn guided by the situation ethic, as opposed to an *a priori* standard. Quality management demands the application of a balancing test to aid in the resolution of dilemmas. Such a balancing test contrasts negative costs and positive benefits that must be evaluated in making allocation decisions for scarce or valuable resources. If medico-legal policies can be advanced or improved which assure higher standards of qualitative living, Professor

Smith believes that they must be pursued. According to Smith, the freedom to engage in charting the perimeters of the New Biology and achieving mastery of the genetic code must be nurtured and guaranteed.

Ultimately, Smith sees the goal of any deliberative process in this field of concern as the maximization, when it exists, of the total potential for human growth and development, interpersonal relations, and intellectual fulfillment. At the same time, Smith reminds his reader of another equally important goal to be accomplished within the framework of the New Biology. This second goal is to minimize the suffering connected with the attainment and perpetuation of this maximization goal. The test the author suggests requires a balancing between the utility of simply maintaining the good (measured by social, economic, cultural, or political yardsticks) and the gravity of the harm of undertaking a new and different course of action. An example of the dilemma to which Smith applies this balancing test is the prolongation of the life of AIDS patients and other terminally ill persons.

In many respects, Professor Smith's thesis and development of a basic cost-benefit analysis as a construct for biomedical and biotechnological decision-making is arguably correct. It is another occasion when Professor Smith teeters on the border between sending a challenge to his reader or, in the alternative, proposing an unacceptable and extreme solution which may certainly upset or insult the sensitivities of the more orthodox and traditional individual. His emphasis on economic efficiency² in allocation decisions of the New Biology may transcend humane and compassionate values.

Human rights, autonomy, self-determination, and a basic sense of freedom must be safeguarded.³ Smith argues that even these "inalienable rights" should be negotiable if the end result of science — the minimization of human suffering and the maximization of "societal good" — is to be realized. Social utilitarianism may then become the goal and thus result in compromising personal autonomy. To many, this price will be far too great

2. See R. POSNER, *ECONOMIC ANALYSIS OF LAW*, chs. 1, 2, & 5 (2d ed. 1977).

3. Kirby, *Human Rights — The Challenge of the New Technology*, 60 *AUSTL. L.J.* 170, 171 (Mar. 1986).

to pay for such "societal good." Smith will find many allies when he concludes that if the pursuit and development of the New Biology is undertaken in a reasonable, rational and *safe* manner, there is only a minuscule risk that man will be dehumanized and depersonalized as a consequence of the mastery of the genetic code.

II. Chapter Analysis

In Chapter One, *Biotechnology: The Challenges and The Opportunities*, Professor Smith sets forth the staggering scope of biotechnology as a venture capitalist business with a forty billion dollar growth potential by the year 2000.⁴ The combined influences of biology, biochemistry and genetic engineering provide an exciting base for biotechnology. At the same time, fears of uncontrolled and advanced experimentation with recombinant DNA (deoxyribonucleic acid), whereby cells of species may be retrofitted with chromosomes from others, place a damper on the principle of scientific freedom to experiment fully with the New Biology. Even with the current work being performed to decipher all the 100,000 genes in the human body, known collectively as the genome,⁵ progress in the field of biotechnology will be measured and constrained due to the lack of public education about the positive potential for development.

The depth of public ferment over the advances of the New Biology was seen in May, 1987, with the announcement by the United States Patent and Trademark Office that "non-naturally occurring nonhuman multi-cellular living organisms, including animals, [are] to be patentable subject matter."⁶ Theologians became upset that that policy was an uncontrolled giant step toward mounting the slippery slope that would eventually lead to the patenting of genetically altered human beings and man's ac-

4. Gladwell, *Washington Area Expected to Retain Leadership Role in Biotech Industry*, Wash. Post, Mar. 7, 1988, (Business Magazine), at 2, col. 1. See also Cinelli, *Biotechnical Research and Development: The Joint Venture as a Viable Corporate Entity in a High Risk Industry*, 13 J. CORP. L. 549 (1988).

5. Thompson, *Mapping the Human Genes*, Wash. Post, Feb. 16, 1988, (Health Magazine), at 8, col. 1.

6. *Should Animals Be Patented?*, TIME, May 4, 1987, at 110. See also Gladwell, *Genetically Altered Livestock: Who Owns Their Offspring?*, Wash. Post, Oct. 9, 1988, at 1, col. 2.

quisition of God-like powers.⁷

These concerns aside, since no catastrophic consequences have resulted from over ten years of research and development of new biological technologies in this field, these ethical, religious, and philosophical concerns will, in the long run, as Professor Smith states, have little practical effect on restraining further advancements of biotechnology. The real impetus for development of the field, of course, can be traced to the United States Supreme Court decision in *Diamond v. Chakrabarty*⁸ that allowed new forms of laboratory life to be eligible for patent. Smith explores this legal impetus, complete with the continuing and gnawing fear of the effects it will bring to society, in Chapter Two, *Law, Science and The New Biology*.

The central ethical fear concerning the patenting of new life forms is that short-term profit motives will predominate over sound philosophical principles of arrangement and determination. Since the etiology of new life-forms is political in nature, its costs and its benefits become a public interest and concern.⁹ Human rights, autonomy, self-determination, and a basic sense of freedom must all be safeguarded,¹⁰ yet they appear to have become negotiable in the quest for knowledge in biomedicine. This, in turn, could well result in minimizing human suffering and maximizing the social good to society at large. Social utilitarianism, then, may sometimes — of necessity — become the goal and thus compromise personal autonomy.¹¹ I am in agreement with Professor Smith in this chapter when he concludes that if the pursuit and development of the New Biology is undertaken in a reasonable, rational and *safe* manner, there is no reason to think man will be dehumanized and depersonalized as a consequence of the quest for mastery of the genetic code.

Chapter Three, *Medical, Legal and Ethical Conundrums at The Edge of Life*, studies the plight of the approximately thirty

7. Wallis, *supra* note 6, at 110.

8. 447 U.S. 303 (1980).

9. See, e.g., Office of Technology Assessment, 98th Cong., COMMERCIAL BIOTECHNOLOGY: AN INTERNATIONAL ANALYSIS (Jan. 1984); Annas, *Life Forms: The Law and the Profits*, 8 HASTINGS CENTER REP. 21 (Oct. 1978).

10. See *supra* note 3.

11. See Smith, *Biotechnology and the Law: Social Responsibility or Freedom of Scientific Inquiry?*, 39 MERCER L. REV. 437 (1988).

thousand genetically handicapped infants born each year in the United States.¹² As he probes the effect of advancing strides in neonatology and the emergence of neonatal intensive care units since the mid-1960s, Professor Smith structures a careful analysis of the legislative initiatives¹³ and court decisions¹⁴ that both set the limits and place the guarantees necessary to ensure that the civil rights of all citizens — regardless of age — are protected from discrimination.¹⁵

Professor Smith's position recognizes that the autonomy of the parent-physician relationship should be maintained in this critical area, with respect provided and latitude assured to the afflicted families and their physicians. This posture is consistent with that reached by The President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research in its 1983 Report, *Deciding to Forego Life-Sustaining Treatment*.¹⁶ The Commission concluded that the best approach to be taken in issues regarding treatment or nontreatment of genetically defective newborns was to recognize a nontreatment protocol as not unethical. Furthermore, the decision should be made by the concerned parents with the advice of an attending or consulting physician; but, in any case, without legislative intervention.¹⁷

The valid governmental interest in ensuring that all citizens, regardless of age or infirmity, should not be discriminated

12. Ellis, *Letting Defective Babies Die: Who Decides*, 7 AM. J. L. & MED. 393 n.1 (1981).

13. See, e.g., The Rehabilitation Act of 1973, § 504, 29 U.S.C. § 794 (1982); Preventive Health Amendments of 1984, 42 U.S.C. §§ 201-99 (1984); Discriminating Against the Handicapped by Withholding Treatment or Nourishment, Notice of Health Care Providers, 47 Fed. Reg. 26, 27 (1982); Nondiscrimination on the Basis of Handicap, 48 Fed. Reg. 9630 (1983); Child Abuse and Neglect Prevention and Treatment Program, 50 Fed. Reg. 14,878 (1985).

14. See, e.g., *Bowen v. American Hosp. Ass'n*, 106 S. Ct. 2101 (1986); *American Hosp. Ass'n v. Heckler*, 585 F. Supp. 541 (S.D.N.Y. 1984).

15. See, e.g., Childress, *Triage in Neonatal Intensive Care: The Limitations of a Metaphor*, 69 VA. L. REV. 547 (1983).

16. PRESIDENT'S COMM'N FOR THE STUDY OF ETHICAL PROBLEMS IN MEDICINE AND BIOMEDICAL AND BEHAVIORAL RESEARCH, *DECIDING TO FOREGO LIFE-SUSTAINING TREATMENT* 226, 227 (1983) [hereinafter PRESIDENT'S COMM'N STUDY].

17. *Id.* See generally G. Smith, *Long Days Journeys Into Night: The Tragedy of The Handicapped At-Risk Infants*, in MORAL ISSUES IN MENTAL RETARDATION 129 (1985).

against can be met through reliance on the individual state's child abuse laws rather than relying on broadly focused and unrestricted federal lawmaking and regulatory efforts that compromise family values of autonomy.¹⁸ The judiciary, when called upon to evaluate cases of alleged abuse of handicapped newborns, can be assisted by a close working partnership with the medical profession. It can profit from the guidance of ethics review committees which seek to clarify and determine those situations where the withholding of needed medical or surgical modalities of treatment would not only be in the afflicted infant's best interests but also in the best interests of those immediately concerned.¹⁹

The role of genetics in family planning is analyzed in Chapter Four, *The Contemporary Influence of Genetics and Eugenics in Family Planning*. We are told by Professor Smith that if we approach mastery of the genetic code and seek a greater understanding of sociobiology²⁰ (a study of the biological basis of all social behavior), with the careful resolve — as he has stressed before — to minimize all human suffering and to maximize the social good (or, the maintenance of health and prevention of disease), we cannot achieve anything less than success. On this premise, Smith cannot be faulted — for he wishes to encourage experimentation and the use of programs that stress the maintenance of a qualitative standard of existence. However, the dangers of genetic manipulation are very real; and once again, mounting the slippery slope of eugenic control becomes a potential hazard.

A primary goal of genetic engineering is to develop new and effective treatment for individuals with inherited diseases.²¹ Investigations are currently being conducted to perfect gene deletion surgery, splicing and transplantation, cloning, *in vitro* fertilization, embryo implantation, parthenogenesis, amniocentesis,

18. PRESIDENT'S COMM'N STUDY, *supra* note 16, at 226, 227. See generally Kuzma, *The Legislative Response to Infant Doe*, 59 IND. L.J. 377 (1984).

19. See generally Lorber, *Early Results of Selective Treatment of Spina Bifida Cystica*, 4 BRIT. MED. J. 201 (1973).

20. Sociobiology is the systematic study of the biological basis of all social behavior. E. WILSON, *SOCIOBIOLOGY: THE NEW SYNTHESIS* 595 (1975).

21. Kass, *The New Biology: What Price Relieving Man's Estate?*, SCI. 779, 780 (1971).

and further experimentation concerning the scope and application of DNA.²²

In the effort to combat genetic disease, genetic engineers often rely upon eugenics — the science which deals with the improvement of heredity. Thus, under a positive eugenics program, superior qualities (e.g., good genetic health, intelligence) are sought to be developed by the propagation of superior genes.²³ On the other hand, a negative eugenics program attempts only to eliminate genetic weaknesses.²⁴ Thus, a strict implementation would result in a positive eugenics program which offers encouragement to the genetically fit individuals to reproduce, while negative programs discourage the less fit and those with inheritable diseases from procreating.²⁵

Professor Smith evaluates the potential for achieving genetic strength through both a program of positive eugenics²⁶ and — contrariwise — a negative eugenics program tied to genetic screening and counseling. Here, the objective is to identify carriers of genetic diseases and thereby advise them whether reproduction is biologically desirable. Screening and counseling may occur at both preconceptual and postconceptual states.²⁷ Amniocentesis, as a postconceptual screening procedure, has emerged as a principal element in a negative eugenics program.

As might be expected, there is strong debate over whether the state, through legislation, can constitutionally require genetic screening for the population at large in much the same manner as present laws require vaccinations and chest X-rays for school children.²⁸ If the state, however, declared that there was a present danger to the genetic inheritance or profile of its

22. See generally Gorne, *The New Biology and the Future of Man*, 15 UCLA L. REV. 267 (1968).

23. See Vokowich, *The Dawning of the Brave New World — Legal, Ethical and Social Issues of Eugenics* in 2 ETHICAL, LEGAL AND SOCIAL CHALLENGES TO A BRAVE NEW WORLD 18 (G. Smith ed. 1982).

24. *Id.* See also Frankel, *The Specter of Eugenics*, 57 COMMENTARY 25, 30 (1974).

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

26. Smith identifies artificial insemination, sperm banks, *in vitro* fertilization, embryo implants, and asexual reproduction as part of a positive eugenics program.

27. See Waltz & Thigpen, *Genetic Screening and Counseling: The Legal and Ethical Issues*, 68 NW. U.L. REV. 696 (1973).

28. See Frankel, *supra* notes 24, 29; Waltz & Thigpen, *supra* note 27, at 709, 730.

citizens if certain genetic diseases were running rampant, it would seem relatively easy for the state to exercise its police power as necessary to order genetic screening. Already, the AIDS epidemic has encouraged states to enact sexually transmissible disease control legislation which requires testing for AIDS prior to the issuance of a marriage license.²⁹ It is then conceivable that the police power could allow for genetic screening as well.

Professor Smith acknowledges the assertions of some that eugenic control or controlled breeding is dangerous, foolhardy, destructive of the integrity of the family, and violative of the fundamental right to determine the size of the family unit. He concludes, however, that genetic planning and eugenic programming are more humane and rational alternatives to an overpopulated world where famine and war are the principal control mechanisms. Although I accept his premise and its hope for improved genetic health, I am fearful of the attendant consequences that will arise through the possible abridgement of various fundamental human rights if eugenic controls are mandatory and no longer voluntary.

Organ procurement policies are discussed in Chapter Five, *Organ Procurement and Transplantation: The Scope of The Problem*. Here, Smith's focus is to analyze the various constructs for decision-making in procuring and allocating scarce human organs.

In 1980, there were approximately 36 heart and liver transplants in the United States. By 1984, 346 heart and 308 liver transplants were performed — and, in 1985, the statistics doubled again. Kidney transplants rose from 4697 in 1980 to 6968 in 1984 and then to 7695 in 1985.³⁰ Today, transplantation has become an accepted form of treatment for a great variety of life-threatening conditions. The only apparent impediment to expansion of transplantation is the shortage of organs.³¹

Although a National Organ Transplant Act was passed in

29. See, e.g., ILL. ANN. STAT. ch. 40, para. 204(b) (Smith-Hurd 1988); TEX. REV. CIV. STAT. ANN. art. 4419b-1 (Vernon Supp. 1989).

30. Childress, *Some Moral Connections Between Organ Procurement and Organ Distribution*, 3 J. CONTEMP. HEALTH L. & POL'Y 85, 87 (1987).

31. Comment, *The Law of Human Organ Procurement: A Modest Proposal*, 1 J. CONTEMP. HEALTH L. & POL'Y 195 (1985).

1984,³² each state and the District of Columbia have structured a legal framework for organ procurement in accordance with the Uniform Anatomical Gift Act.³³ The reality of practice finds not only a woeful lack of education and great fear among the general public regarding the procurement and donation of organs, but also a far too frequent willingness to disregard decisions concerning donations by decedents' family members or loved ones at the actual moment when the questioned organs must be harvested.³⁴ Even with the development of more sophisticated transplantation procedures, and increased success with immunosuppressive medications, the supply of organs remains the major problem. Moreover, this supply problem is not tied exclusively to economic or technical considerations. Rather, to a large extent, it is tied to both moral and legal barriers that place a limit on the number of organs that may be available from live or cadaver sources.³⁵

The approach which Professor Smith advocates would require the adoption of a uniform policy or regulation allowing the routine removal of useful cadaver organs, while safeguarding the right of a prospective donor to object — during his life — to the removal of his organs after death. Under this approach, if the donor consents to the use of his organs at death, no family member would be empowered to veto this decision. Where a prospective donor neither specifically objects nor expressly assents to the removal of his organs at death, the next of kin would be allowed to object to the removal of his organs at death, any time *before* the organs are harvested. A policy structured as such would serve to obviate any constitutional issues regarding freedom of religion that demand the preservation of the whole body upon death.³⁶

Even if society continues to accept the various schemes for

32. National Organ Transplant Act, Pub. L. No. 98-507, 98 Stat. 2339-48 (1984).

33. See UNIF. ANATOMICAL GIFT ACT, §§ 1-11, 8A U.L.A. 15 (1983 & Supp. 1989) (a chart appended to the Uniform Anatomical Gift Act lists each state that has adopted the Act and where the Act can be found in the respective state statute).

34. See Childress, *supra* note 30, at 89.

35. M. SHAPIRO & R. SPECE, JR., CASES, MATERIALS AND PROBLEMS ON BIOETHICS AND LAW 767 (1981).

36. Dukeminier & Sanders, *Organ Transplantation: A Proposal for Routine Salvaging of Cadaver Organs*, 279 NEW ENG. J. MED. 413, 418 (1968).

the allocation and distribution of organs and tissue for allogenic transplant, the question of payment must still be addressed. As medical science develops more efficacious treatment protocols for malignant disease, the demand and need for autologous bone marrow transplants (ABMT) will steadily increase. Measured in 1988 dollars, a typical complete treatment including professional services, supplies, chemotherapies, and hospitalization is in the range of \$125,000 per patient. While technology may allow increased numbers of patients to share in the benefits of the newest scientific advances, financing will remain an allocative problem.

Presently, there are no uniform principles applied in regulating the allocation of scarce medical resources. What has emerged, for utilitarians, is an approach that awards priority use of an organ to those for whom treatment has the highest probability of medical success, is most useful under the immediate circumstances, and achieves the highest possible amount of benefit.³⁷ Contrariwise, egalitarian principles of distribution seek either a basic maintenance or a restoration of equality for persons in need of a particular scarce resource.³⁸ The major principle employed here is that of saving no one — thus, priority is given to no one, simply because, one should not be saved if not all can be saved.³⁹

I agree with Professor Smith's conclusion that no principle of preference is clearly correct, humane, or totally just. The facts of each case, to a very large extent, will structure the principle utilized. Thus, consequences are very important to the final choice of any strategy. The basic concept of salvability, ingrained in the doctrine of *triage*, should provide a traditional mechanism for evaluating cases.

Chapter Six, *El Dorado and The Promise of Cryonic Suspension*, investigates the mysteries and the potential for cryobiology, cryogenics, and cryonics. Biologists working with low temperature experiments from the 1950s coined the term

37. Smith, *Triage: Endgame Realities*, 1 J. CONTEMP. HEALTH L. & POL'Y 143, 146 (1985).

38. *Id.* at 147.

39. *Id.* Other egalitarian principles for decision-making include: the principle of medical neediness, the principle of general neediness, the principle of queuing and principles of random selection. *Id.*

"cryobiology" to describe investigations that were conducted well below normal body temperatures.⁴⁰ Cryonics refers broadly to the technology of low temperature experiments, while cryogenics refers to all those disciplines and/or programs centered on human cold storage.⁴¹ Smith pays particular attention to one aspect of cryonics — namely, human cryonic suspension.⁴²

Popular news stories have reported "deep freeze" burials and the processes involved in providing the continuous services necessary for suspension. On March 15, 1980, the NBC television network segment of its program, "Prime Time Saturday," reported on the state of cryonic suspension and found that approximately one hundred persons had contracted to be frozen upon death for an initial cost of \$12,000 and an annual charge of \$2,000 a year for maintenance thereafter. In 1976, some twenty-four bodies were in suspension.⁴³

Stated simply, the goal of cryonic suspension initiated *after* normal death occurs, is to effect an entire state of human animation. During the animation or suspension, it is hoped that the specific cause of the cryon's (suspendee's) death can be found and remedied (*e.g.*, the cancer cured) with reanimation administered, revival achieved, and repair undertaken so that the individual can become a healthy functioning member of society. While the literature of cryobiology contains recorded successes in the freeze-preservation of viable cell suspensions, blood serum, and micro-organisms, semen, and nonviable tissues used for transplantation, cryosurgery, and the preservation of large mammalian organs,⁴⁴ a total cryonic suspension of an entire human body *and its revival* has yet to be achieved.⁴⁵

Several pivotal issues in cryonics are addressed by Professor Smith: the extent to which a physician may be guilty of malpractice in presiding over a suspension that, for some reason,

40. A. SMITH, CURRENT TRENDS IN CRYOBIOLOGY (1970).

41. R. ETTINGER, MAN INTO SUPERMAN 251 (1972).

42. See generally Smith, *Cryonic Suspension and the Law*, 17 OMEGA J. DEATH & DYING 1 (1986).

43. NEWSWEEK, Aug. 16, 1976, at 8. See generally R. NELSON, WE FROZE THE FIRST MAN (1968).

44. For a discussion of research in cryobiology and cryosurgery, see Mazur, *Cryobiology: The Freezing of Biological Systems*, 168 SCI. 939 (1970).

45. For a discussion of various suspension and revival attempts on nonhuman organisms, see B. LUYET & M. GEHENIO, LIFE AND DEATH AT LOW TEMPERATURES (1940).

goes awry; the extent of criminal liability for murder if a cryonic intervention is undertaken *before* death and occurs using present legal-medical definitional standards of death; and the need to perhaps structure and validate a working definition of "cryonic suspension" thus avoiding the threat of an imposition of criminal liability for murder. If this particular suggestion were followed, the laws of inheritance — conditioned by The Rule Against Perpetuities⁴⁶ — would have to be reworked as well. This conclusion is warranted since the period of cryonic suspension might well exceed the period of time required under the rule for vesting of an interest. Another issue explored is the nature, validity, and enforceability of contracts for cryonic suspension *prior* to death and the assurance that they not be ignored upon actual death.⁴⁷ Truly, this chapter captures the vital spirit of the mysteries, the challenges, and the opportunities of the New Biology and shows dramatically how law, science, medicine, ethics, and biotechnology are the vital vectors of force in all decision-making as the New Biology becomes the current medical practice.

The AIDS epidemic is considered next by Professor Smith in Chapter Seven, *AIDS: The Private and The Public Dilemmas*. And, it is in this chapter that he presents a very conservative and controversial strategy for coping with AIDS.

Smith draws upon the Illinois Sexually Transmissible Control Act⁴⁸ that allows for the quarantine of AIDS carriers, as well as other legislation requiring premarital testing for AIDS,⁴⁹ to propose an absolute ban on marriage if any intended spouse is found to carry the virus. The only way such a marriage could be validated would be for the at-risk partner to be sterilized. He would also seek to quarantine the carrier. Noting that some carriers are more responsible than others and that he is *not* arguing

46. The rule provides that a property interest is not valid unless it vests not later than 21 years, plus the period of gestation, after some life or lives in being when the interest is created. BLACK'S LAW DICTIONARY 1195 (5th ed. 1979).

47. See Smith, *The Iceperson Cometh: Cryonics and The Law*, 1 J. CONTEMP. HEALTH ISSUES 23 (1983).

48. ILL. ANN. STAT. ch. 111½, paras. 7401-7410 (Smith-Hurd 1988) (para. 7407(b) allows for the quarantine of AIDS carriers, with court authority, when individuals so endanger the public and "clear and convincing evidence" of this threat to the public welfare is significant).

49. See *id.* ch. 40, para. 204(b) (Smith-Hurd 1988).

for mass detention centers or wings reserved for AIDS patients in public hospitals or prisons, he holds open the option that mass detention may become a necessity in the future.⁵⁰

Screening of various high-risk groups is also a part of the Professor's AIDS strategy. He justifies any potential violation of the civil rights of the afflicted or targeted groups by recognizing the nature of the threat to the greater world community of the AIDS pandemic. He hits hard on the point that for every inalienable or fundamental right, there is a coordinate *responsibility* to exercise it reasonably. And, when it is shown that an individual has acted unreasonably, the government is justified in conditioning its response to the principle of undertaking action in order to achieve the greatest good for the greatest number of its citizens. Thus, he concludes, the screening and quarantine of AIDS patients are the two most realistic avenues for present action.

Smith has taken the quantum leap from assuming that there is an adequately reliable test for AIDS (few false positive test results) and concludes that the use for such screening results should be to quarantine all those who test positive for HIV. One recent study has shown an acceptable false positive rate, however, of 0.0007 percent.⁵¹ Yet, it has been noted, that this statistic does not address the sensitivity of the test, but only the specificity.⁵²

High specificity usually comes at the expense of sensitivity — the ability of the test to correctly identify those with the disease. Sensitivity was not calculated in the former study,⁵³ because the true prevalence of infection in the study population was unknown. Accordingly, if a test's sensitivity is unknown, any discussion of its usefulness as a screening tool will be incomplete. This particular study by Burke and others also does not address the cost of the screening (probably about \$40,000 per true positive specimen) or the likelihood that the military's im-

50. See also Duncan, *Public Policy and the AIDS Epidemic*, 2 J. CONTEMP. HEALTH L. & POL'Y 169 (1986).

51. Burke, et. al., *Measurement of the False Positive Rate in a Screening Program for Human Immunodeficiency Virus Infections*, 319 NEW ENG. J. MED. 961, 962 (1988).

52. Weiss & Thier, *HIV Testing is The Answer—What's The Question?*, 319 NEW ENG. J. MED. 1010 (1988).

53. See Burke, *supra* note 49, at 963.

pressive accuracy and quality control could be duplicated by less experienced laboratories.

Most important of all is the consequence and expense of quarantine for over 1,000,000 United States citizens even if the obstacles of false positive and false negative tests are overcome.⁵⁴ The United States Supreme Court decision in *Korematsu v. United States*⁵⁵ in 1944, was written at a time when there was a popularly perceived imminent threat of foreign invasion by an enemy against whom a formal declaration of war had been approved by Congress. Without doubt, there is a widespread sense that the AIDS epidemic represents a great *potential* risk for the welfare of the United States. There is popular sentiment that supports some compromise of individual freedoms as a cost of gaining better knowledge and possible control of the AIDS epidemic.⁵⁶ Yet, contradictions to this apparent endorsement of a limitation on the rights of association of AIDS patients are to be found in a significant level of opposition to obvious discrimination directed at victims of AIDS.⁵⁷ Regardless of opinion polls, public opinion is not to be recognized as a substitute for the Bill of Rights in a constitutional democracy. Stated more directly, testing and quarantine may be popular, but that does not necessarily make them constitutionally permissible.

Continuing his conservative posturing in Chapter Eight, *Noble Death, Rational Suicide or Self Determination*, Professor Smith calls for the reclassification of the concept of suicide and, in its place, acceptance of the principle of self-determination. This posturing has critical significance when the issue of death control is brought into focus. The quest for a noble or dignified death (to that degree possible) is in everyone's best interest. Yet, within this question an inherent paradox is found. When blind efforts are made to preserve the mere quantity of life, the quality of life, the dying process, and the final act of death itself may be in fact degraded.

54. For a discussion of false positive and false negative tests, see Goedert, *Testing for Human Immunodeficiency Virus*, 105 ANNALS INTERNAL MED. 609 (1986).

55. 323 U.S. 214 (1944).

56. Blendon & Donelan, *Discrimination Against People with AIDS: The Public's Perspective*, 319 NEW ENG. J. MED. 1023 (1988).

57. *Id.* at 1025.

The Council on Ethical and Judicial Affairs of the American Medical Association structured a new policy in 1986 allowing a physician to ethically withdraw "all means of life-prolonging medical treatment" including food and water, from a patient in an irreversible coma.⁵⁸ This direction, coupled with Living Will and Natural Death legislation adopted or considered by many states, advances the principle of autonomy or self-determination in death management and allows incremental steps toward recognition of passive euthanasia.⁵⁹ Professor Smith advocates that in these cases self-destruction should be properly viewed merely as acts of final determination.

Chapter Nine is entitled *Procreational Autonomy: Values Gone Awry?* and presents a fulsome and argumentative analysis that shows there is no "fundamental right" to artificial insemination of unmarried women and that those statutes which limit this practice to married women are reasonable and reflective of sound public policy considerations that recognize the family as the bulwark of society. Professor Smith examines surrogation as an analytic complement to the so-called "sexual privacy" of some women as they seek to express their sexual freedom or procreational autonomy with the aid of unconventional or artificial means to become pregnant.⁶⁰ He explores the legislative and judicial history of artificial insemination and the growing use — and its attendant complexities and liabilities — of surrogation.⁶¹

Chapter Ten, *The Case of The Orphan Embryos*, examines as a paradigm of the complexities of the New Biology, the major international news story of June 18, 1984: the discovery of two frozen embryos which survived the estate of their actual mother and putative father.⁶²

58. Statement of the Council on Ethical and Judicial Affairs, American Medical Association, in Chicago, Ill. (Mar. 15, 1986). See Colburn, *AMA Ethics Panel Revises Rules on Withholding Food*, Wash. Post, Apr. 2, 1986 (Health Magazine), at 9.

59. See generally Newman, *Treatment Refusals for the Critically and Terminally Ill: Proposed Rules for the Family, the Physician, and the State*, 3 N.Y.L. SCH. HUM. RTS. ANN. 35 (1985); PRESIDENT'S COMM'N STUDY, *supra* note 16, at 139-45.

60. See R. SNOWDEN & G. MITCHELL, *THE ARTIFICIAL FAMILY* (R. Snowden & G. Mitchell eds. 1981); Kritchevsky, *The Unmarried Woman's Right to Artificial Insemination: A Call for an Expanded Definition of Family*, 4 HARV. WOMEN'S L.J. 1 (1981).

61. See *In re Baby M*, 217 N.J. Super. 313, 515 A.2d 1128 (Ch. Div. 1987), *aff'd in part and rev'd in part*, 109 N.J. 396, 537 A.2d 1227 (1988).

62. Hancock & Ford, *Frozen Embryo Orphan Heirs to \$8m Estate*, THE AUSTL.,

Briefly, the facts were that in 1981, a Los Angeles, California, couple — Mario and Else Rios — participated in the *in vitro* fertilization program of Melbourne's Queen Victoria Medical Center. At that time, Mr. Rios was fifty-four years old and infertile. With his informed consent, an anonymous donor from Melbourne was allowed to artificially inseminate three eggs from Mrs. Rios, with one being implanted and the other two frozen for possible future use. After miscarrying the implant, Mrs. Rios was not emotionally stable to pursue further implantations. Before she could return and use the other embryos, she and her husband died in a Chilean plane crash.

Under the laws of intestate succession in California, since no will had been executed by the Rios', Mrs. Rios' son by a previous marriage was entitled to his father's share of the estate and Mrs. Rios' sixty-five year old mother took her daughter's share.⁶³ The major issues raised by this situation are: 1) do the two frozen embryos have any legal rights to "live" and thus be implanted in a surrogate mother; 2) if born, can the child assert inheritance rights in the Rios' estate; and 3) to what extent is research into the new reproductive technologies to be allowed or restricted?⁶⁴

Professor Smith examines, at length, the Australian efforts at lawmaking and law reform, centered around the dilemma of the Rios scenario. He finds that the traditional legal view is that prior to birth *and* separation from its mother, a fetus (or an embryo) has but potential or contingent civil legal rights in addition to enjoying limited protection under the criminal laws of abortion and child destruction.⁶⁵ Buttressed by various reports from the prestigious Law Reform Commission, the conclusion is that the Melbourne "orphan" embryos have no claim against the Rios' estate — indeed, they have no "rights" of any nature.⁶⁶

June 18, 1984, at 7, col. 7.

63. Wallis, *Quickening Debate Over Life on Ice*, TIME, July 2, 1984, at 68.

64. See Smith, *Intimations of Life: Extracorporeality and the Law*, 21 GONZ. L. REV. 395, 418-21 (1985-86).

65. *Attorney General for the State of Queensland (Ex rel. Kerr) and Arthur v. T.*, 57 AUSTL. L.J. REV. 385 (1983); *McKay v. Essex Health Auth.*, 2 W.A.L.R. 890 (1982).

66. See L. WALLER, REPORT ON THE DISPOSITION OF EMBRYOS PRODUCED BY IN VITRO FERTILIZATION (Aug. 1984); Bates, *Legal Criteria for Distinguishing Between Life and Dead Human Fetuses and Newborn Children*, 8 U. NEW S. WALES L. REV. 143 (1983).

As research will surely continue into new reproductive technologies, with *in vitro* research leading the areas to be perfected, legal mechanisms must be established to both regulate and accommodate this development. Experimental research must precede therapeutic efforts here. But, as Professor Smith observes, one point cannot be disputed: work will continue in this area simply because childless married couples will not accept the judgment of biological fate that may decree one or both infertile.

The key should be the development of model state legislation that clearly defines the identity of both the legal mother and father of all children (including as such those born to other than their genetic parents); the development and promulgation of guidelines for sound clinical practice, and finally, the establishment of a functioning national body of legislative advisers drawn from all concerned disciplines. Their primary duty would be to advise the United States Congress on specific legislative initiatives and regulatory schemes that would meet and stabilize the program of new reproductive technologies.⁶⁷

Professor Smith continues to challenge his readers with the final chapter in his book, *Science, Religion and The New Biology*. This is a fitting complement to Chapter Two, *Law, Science and The New Biology*, and as such, focuses upon certain dilemmas inherent in any consideration of the role of religion and the scientific method.⁶⁸ Of primary concern is the central most expression of a creed as being an embodiment of both eternal and absolute truth.⁶⁹ Contrariwise, scientific theory is recognized merely as tentative — with modifications at one time or another always found necessary. Thus, unlike a religious creed, the scientific method is logically incapable of arriving at a penultimate statement.⁷⁰ While faith and feelings combine to give rise to beliefs in a religion, faith may be viewed as a rather primitive scientific “principle.” Yet, Smith stresses that, in reality, there should be no conflict between science and religion, since religion should be devoted to the expression and the fulfillment of a set

67. See Annas, *Redefining Parenthood and Protecting Embryos: Why We Need New Laws*, 14 HASTINGS CENTER REP. 50 (Oct. 1984).

68. See B. RUSSELL, *RELIGION AND SCIENCE* (1935). See also I. BARBOUR, *MYTHS, MODELS AND PARADIGMS: A COMPARATIVE STUDY IN SCIENCE & RELIGION* (1974).

69. B. RUSSELL, *supra* note 68, at 14.

70. *Id.* at 13-14.

of final values beyond which no other values can be said to exist.⁷¹ The scientific approach to religion is seen as a noble effort to study not only the true history of man, the relation to the source of his being and his duties, but the privileges and structure of values.

After these observations, Smith then turns his analysis to a consideration of three theological views of artificial conception concerning the use of donor sperm, or *heterologous* insemination (A.I.D.) to allow a married woman to conceive, or *homologous* insemination (A.I.H.), where semen is collected from a wife's husband through mechanical or auto-erotic techniques.⁷² This analysis allows the reader to witness the complexities encountered in those matters of faith when pitted against the new, scientific promise of combatting or alleviating, in some cases, problems of infertility.

The official Roman Catholic position on artificial insemination is simple and direct: it violates the exclusivity and intimacy of the conjugal bond of love by its very *artificiality* and is thus, not proper — even though it may be the only method by which procreation may be achieved.⁷³ The Church takes the same position toward fertilization achieved by *in vitro* or *in vivo* means and experiments with genetic engineering that involve embryos.⁷⁴ Its position was reaffirmed in a document issued March 10, 1987 by the Vatican entitled "Instruction on Respect for Human Life in Its Origin and on the Dignity of Procreation: Replies to Certain Questions of the Day."⁷⁵ Instead of perverting the sacredness of the marital bond, artificial methods of fertilization should be applauded as a strengthening of love and procreation.⁷⁶ As Professor Smith observes, most barren Catholic

71. Murray, *Two Versions of Man in Science* PONDERS RELIGION 147, 148 (Shapley ed. 1960).

72. See Smith, *Through a Test Tube Darkly: Artificial Insemination and the Law*, 67 MICH. L. REV. 127, 128 (1968). See also Smith, *The Razor's Edge of Human Bonding: Artificial Fathers and Surrogate Mothers*, 5 W. NEW ENG. L. REV. 639, 640 (1983).

73. KOSNIK, *et al.*, HUMAN SEXUALITY—NEW DIRECTION IN AMERICAN CATHOLIC THOUGHT 137-40 (1977).

74. Smith, *Theological Reflection and the New Biology*, 48 IND. L.J. 605, 619-22 (1973).

75. See Editorials, *New Vatican Instruction on Human Life and Procreation*, AM., Mar. 28, 1987, at 245.

76. See generally J. FLETCHER, *THE ETHICS OF GENETIC CONTROL* 115 (1974).

couples suffering from the heartbreak of a childless marriage will simply not be guided by a distant edict from Rome.

The conservative Protestant Ethic holds that a monogamous marriage is the biblical expression of God's unalterable will, and thus, the only alternative to marriage is abstention from sexual intercourse.⁷⁷ Accordingly, a proper inference drawn from this philosophy is that donor artificial insemination is morally objectionable as an invasion of the unity of marriage.⁷⁸ The more liberal and contemporary Protestant view holds, however, that since all of the biblical commandments are at best ambiguous expressions of the will of God, no universal modes of conduct are required and artificial conception is proper.⁷⁹ Interestingly, under Jewish Law, a woman participating in A.I.D. is not regarded as having committed an act of adultery; the offspring are recognized as legitimate in all cases, regardless of whether the child's mother is married or single.⁸⁰

III. Conclusion

If a modern focus is to be developed for evaluating and, where appropriate, harnessing the wonderment and the challenge of the unparalleled opportunities of the New Biology for making the world and the lives of all who live within it stronger and more qualitative, science and religion must find compatibility rather than disharmony. In the final analysis, a sense of love and humanism must balance knowledge, economic efficiency, and the scientific imperative, or else failure will be the tragic hallmark of the New Biology.

The eleven essays in *The New Biology* which Professor Smith has authored, display his very thoughtful and persuasive realization of this inherent balancing mechanism that must be utilized in decision-making here. For Professor Smith, the central goal of the New Biology is to minimize human suffering and maximize the social good. These essays, then, may be properly viewed as providing an imaginative, compassionate and practical

77. H. SMITH, *ETHICS AND THE NEW MEDICINE* 66, 67 (1970).

78. *Id.* at 67.

79. *Id.* at 68.

80. Rackman, *Morality in Medico-Legal Problems: A Jewish View*, 31 N.Y.U.L. REV. 1205, 1208 (1956).

framework for managing the complex challenges and unlimited opportunities of the New Biology.