1999

SYMPOSIUM: STOPPING SCIENCE -- Stopping Embryo Research

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Recommended Citation
Ronald M. Green, SYMPOSIUM: STOPPING SCIENCE -- Stopping Embryo Research, 9 Health Matrix 235 (1999)
Available at: https://scholarlycommons.law.case.edu/healthmatrix/vol9/iss2/3

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ETHICALLY MOTIVATED EFFORTS to slow or stop programs of scientific research are relatively new. Harbingers of this development are found in the physical sciences. During the early 1950s, some leading scientists raised their voices in an effort to halt development of the thermonuclear "Superbomb."¹ These and later campaigns against anti-ballistic missile (ABM) development programs were typically directed against applied science and weapons initiatives rather than basic scientific research itself. For attempts to halt basic research, we must turn to the life sciences. Beginning with controversies surrounding recombinant DNA research in the late 1970s,² fetal tissue and embryo research in the 1980s,³ and research on human cloning,⁴ and the genetic bases of

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⁴ For a review of the fetal tissue disputes, see, e.g., Steven Maynard-Moody, Managing Controversies Over Science: The Case of Fetal Research, 5 J. PUBLIC ADMIN., RES. & THEORY 5 (1995) (examining the twenty-year fetal research controversy); Anita Stuhmcke, The Legal Regulation of Fetal Tissue Transplantation, 4 J. L. & MED. 131 (1996) (questioning whether a legislative approach to regulating fetal tissue transplantation is preferable to the Australian National Health and Medical Research Council guidelines); Nikki Melina Constantine Bell, Regulating Transfer and Use of Fetal Tissue in Transplantation Procedures: The Ethical Dimensions, 20 AM. J. L. & MED. 277 (1994) (exploring the political, social, and ethical implication of fetal tissue transplantation). For an overview of the ethical and historical issues surrounding human embryo research, see 1 REPORT OF THE HUMAN EMBRYO RESEARCH PANEL (1994) (examining the moral status of the pre-implantation human embryo); 2 NATIONAL INSTITUTES OF HEALTH: REPORT OF THE HUMAN EMBRYO RESEARCH PANEL (1994) (providing papers commissioned for the NIH Panel).
sexual orientation in the 1990s, voices have been raised arguing that whole lines of research ought not to be funded or even allowed.

It will be the job of future historians to answer fully the question of why life sciences research in the areas of genetics and reproduction has become a focal point of attack. My objective here is more limited. I want to show how this broad wave of opposition has impeded human embryo research. In my conclusion I will try to offer some very preliminary answers to the question of why the life sciences in particular have become objects of suspicion. I will also consider what is legitimate and what is morally disturbing about these attacks on a domain of scientific research.

This discussion is organized around four questions. First, what do we mean by human embryo research? Second, what efforts have been made to stop it? Third, what have been the consequences of these efforts? Finally, in terms of ethics, how are we to understand and assess this history of research obstruction?

I. WHAT DO WE MEAN BY HUMAN EMBRYO RESEARCH?

We can define embryo research as the systematic study of a fertilized human ovum that has never been transferred to and has not yet been implanted in a womb. Normally, this means an embryo created by in vitro fertilization, although it can also refer to fertilized ova that have been flushed from the uterus shortly after conception and kept alive in vitro for purposes of study. The defining features of this research entity are its existence ex utero and its early stage of development. Embryos used in research are usu-

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4 A recommendation of a five-year moratorium on human cloning was part of the report and recommendations of the National Bioethics Advisory Commission. See 1 CLONING HUMAN BEINGS: REPORT AND RECOMMENDATION OF THE NATIONAL BIOETICS ADVISORY COMMISSION (1997).

ally in the first two weeks of development, before or just up to the early processes of cellular differentiation, tissue formation, and the appearance of rudimentary bodily form. In all these respects, embryo research differs from fetal research or fetal tissue research, which typically involves a later stage fetus in utero or following abortion.  

Understood this way, embryo research is very much a consequence of the development of the technology of in vitro fertilization (IVF) by Patrick Steptoe, Robert Edwards, and others during the 1970s. This made possible the first systematic study of the live human embryo from fertilization onward. At the same time, the relatively low success rates of IVF increased demand for more systematic research on fertilization and embryo development. Together, these factors have made the issue of embryo research increasingly important in law, ethics, and public policy.

II. WHAT EFFORTS HAVE BEEN MADE TO STOP RESEARCH?

Early IVF researchers like Steptoe and Edwards met little opposition, even though their studies involved activities that later became very controversial. These activities included the deliberate fertilization of oocytes for research purposes with no intent to transfer the resulting embryos (the creation of so-called "research embryos"). During this period, a small number of bioethicists published criticisms of this research. The focus of these criticisms was less on the manipulation of the embryo itself than on the possible harms to children born as a result of these experimental procedures. Conservative bioethicists like Paul Ramsey and Leon Kass condemned efforts to develop IVF because they believed it imposed unknown risks on unconsenting children. In a widely discussed pair of articles published in the Journal of the American Medical Association in 1974, Ramsey half-seriously expressed the wish that the first child produced by IVF might be born deformed, as a warning to those who would tamper with the reproductive process.

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6 See generally 45 C.F.R. § 46.203(c) (1998) (defining fetus as "the product of conception from the time of implantation . . . until a determination is made, following expulsion or extraction of the fetus, that it is viable").

7 See Paul Ramsey, Shall We Reproduce? (pts. 1-2), 220 JAMA 1346, 1480, 1485 (1972) (concluding that "in vitro fertilization is unethical medical experimentation on possible future human beings").
The first serious legal impediments to the progress of embryo research arose in this country at the end of the 1970s. Responding to the advent of IVF, Congress formed a special body, the Ethical Advisory Board (EAB), to review and provide guidance for federally funded research on the human embryo. In late 1979, the EAB issued its report containing a broad permission for such research under federal auspices subject to guidelines and limitations indicated in the report and to be implemented by the Board itself.\(^8\) However in 1979, before the EAB’s recommendations could be put into effect, political intervention stalled their implementation. Later, the Reagan and Bush administrations, reflecting their base of support in the anti-abortion movement, withheld funding for the EAB and made no nominations to its membership. Together, the legal requirement of EAB approval and the absence of a working EAB created a de facto moratorium on Federal funding for embryo research in this country.

This moratorium remained in effect until June 1993 when, with a new Democratic administration in office, Congress passed a law nullifying the earlier requirement of EAB approval.\(^9\) To provide ethical guidance for this area before funding pending proposals, the National Institute of Health (NIH) voluntarily established a special body, the Human Embryo Research Panel. The panel, on which I served, began work in January 1994. It held five monthly meetings in Washington. It was open to the public and it issued its report in September of that year.\(^10\) On December 2, 1994, the Advisory Council to the Director of NIH unanimously accepted the report’s recommendations, which strongly favored Federal support for embryo research. Later that same day, President Clinton issued a directive overruling one of the panel’s recommendation: its permission for the use of research embryos. Eventually, even this limited disagreement with the panel’s recommendations was overtaken by initiatives in the new Republican-dominated Congress. In 1995, Congress used appropriations legislation to bar federal


\(^10\) See 1 NATIONAL INSTITUTES OF HEALTH, supra note 3, at v-vii (presenting an analysis of “various areas of research involving the ex utero pre-implantation human embryo”).
funding of any research that threatened the embryo’s survival.\footnote{See Pub. L. No. 104-34, 109 Stat. 293 (1995) (amending 28 U.S.C.A. § 1391 (1994)).} This included a ban on the use of embryos left over from infertility research, most of which are destined to be discarded. Also barred was research on parthenogenesis,\footnote{Reproduction of organisms without conjunction of gametes of opposite sexes. AM. HERITAGE DICTIONARY 905 (2nd College Ed. 1982).} even though parthenotes, which result from electrical or chemical stimulation of an oocyte, are not embryos and cannot develop beyond several stages of cell division.

Outside the United States, the picture has been mixed. Many European nations (and several states of Australia) ban research that does not contribute to the embryo’s survival.\footnote{See generally Infertility (Medical Procedures) Act of 1984 amended by Infertility (Medical Procedures) (Amendment) Act 1987 (Vic., Australia) (regulating a wide range of IVF activities including limiting practice of IVF to approved facilities, limiting availability to married women, regulating confidentiality, providing for a Standing Review and Advisory Committee, and banning commercial surrogacy; Reproductive Technology Act 1988 (South Australia) (establishing Council on Reproductive Technology, providing a code of ethical practice, establishing licensing procedures, prohibiting embryo flushing, cryopreservation beyond 10 years, and any research “detrimental to an embryo”); Law on the Protection of Embryos (Germany) (making it a criminal offense to alter the genetic make-up of human germ cells, to fertilize human ova for research, to do any destructive embryo research, or to engage in cloning.; see also Law No. 35/1988 on Assisted Reproduction Procedures (Spain) (covering artificial insemination, IVF, and gamete intra-fallopian tube transfer, and formulating provisions on research and experimentation in the most detailed law on the books to date).} In the wake of the Warnock Committee Report, Great Britain developed extensive legislation permitting embryo research.\footnote{Report of the Committee of Inquiry into Human Fertilization and Embryology (Mary Warnock, chair), (HMSO, London, CMND 9314, 1984) [hereinafter Warnock Report]. For a further description of the findings of the Warnock Report, see generally EMBRYO EXPERIMENTATION: ETHICAL, LEGAL, AND SOCIAL ISSUES 188-89, 195 (Peter Singer et al., eds. 1990).} The Human Fertilization and Embryology Act of 1990 established a national board, which, among other things, licenses specific research protocols, including those that employ research embryos and parthenotes.\footnote{Human Fertilization and Embryology Act, 1990, ch. 37 (Eng.).} In one important respect, however, the United States differs from Europe, including Great Britain, where regulations govern all research on the human embryo. In the United States, federal legislation and guidelines ban only federally funded research. To date there has been no federal legislation prohibiting or limiting research with private funds. Some state laws expressly forbid embryo research,
whether public or private. Louisiana's law, for example, defines the embryo as a "juridical person," and requires that it be used in research "solely for the support and contribution of the complete development of human in utero implantation." However, these laws have not typically been enforced, and it is unclear whether they could withstand constitutional scrutiny. A considerable amount of embryo research transpires in this country in connection with the flourishing infertility industry. Nevertheless, the ban on federal funding means that embryo research has been almost entirely excluded from support by the huge, federally funded biomedical research establishment, including the National Institute of Child Health and Development, whose mandate would seem directly related to the impact of infertility research on mothers and children.

III. WHAT HAVE BEEN THE CONSEQUENCES OF THESE EFFORTS AT OBSTRUCTION?

A case can be made that this history of exclusion from federal support in the United States and outright prohibitions elsewhere has had minor impact. Infertility medicine – the area that most directly draws on the results of embryo research – has made substantial progress in the two decades since its inception. Not only have maternal age-adjusted transfer success rates greatly improved, but a host of new technologies – like assisted hatching and intracytoplasmic sperm injection (ICSI) – have been developed to help couples suffering from infertility. Nevertheless, this apparent record of success obscures very serious problems, including lack of progress in key areas, serious iatrogenic health problems associated with infertility medicine, and the turning over

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17 See also id § 9:122 (stating the authorized uses of an in vitro human embryo).
18 See Lori B. Andrews, State Regulation of Embryo Research, in 1 REPORT OF THE HUMAN EMBRYO RESEARCH PANEL, supra note 3, at 297, 303-05 (questioning the constitutionality of laws restricting human embryo research).
19 "Hatching" occurs when an embryo is at the 64-cell stage. The zona pellucida surrounding the pre-embryo is degraded by enzymes at this stage, fluid is pumped into the prembryo, and it begins to increase in size and become hollow. See EMBRYO EXPERIMENTATION, supra note 14, at 6.
of research initiatives in this area to a relatively unregulated private industry.

Lack of progress in research is most evident in connection with our basic understanding of the processes of fertilization, implantation, and early embryological development. It is now established that there is a very high rate of natural embryo loss due to failure to implant. Up to two-thirds of all fertilized eggs do not implant. The causes of this, including cytological, chromosomal, or genetic anomalies in eggs and embryos, are poorly understood. There is evidence that early embryos have complex mechanisms for monitoring, and in some cases repairing, chromosomal abnormalities like polyploidy, although these mechanisms do not always operate effectively. Understanding how these processes work or go wrong not only can assist infertility medicine—by improving our ability to predict the developmental competence of available embryos—it can also aid in the prevention of miscarriages and birth defects. The impact of early embryological problems on the course of established pregnancies is poorly understood as well. Recent discovery of the role of folic acid deficiency in the causation of neural tube defects illustrates the importance of research focused on the earliest phases of the reproductive process. Finally, I should note that embryo research is crucial to the development of improved contraceptives. It is unfortunate that nearly forty years after the development of the first birth control pills, contraceptive options for women around the world have not significantly improved, and in some cases—with the withdrawal of the IUD and contraceptive implants from many markets—have even regressed. Research on embryos that will not be transferred is often the end point of research on fertilization since what must be tested is the ability of measures to block conception without inadvertent damage to any of the embryos. Perhaps responding to the importance of contraceptive research, lawmakers in Australia's Victoria State who banned embryo research chose to utilize a definition of the human embryo that marks its existence not from sperm penetration of the zona pellucida, but from the later point of syngamy. This had the effect of permitting some limited forms of contraception-related research.

One can debate the importance of this lack of progress in key medical areas, but there can be no debate about the seriousness of the health risks associated with infertility medicine today. Both the

21 See EMBRYO EXPERIMENTATION, supra note 14, at 9 (estimating that three out of each hundred eggs result in live birth).
women involved in these procedures and the children produced by them are regularly exposed to health risks as a result of the lack of research. For women, the most direct threat is the use of powerful stimulatory drugs needed to produce multiple ova for fertilization. With the replacement of natural cycle stimulation in the 1980s, this regimen has become the procedure of choice. Despite more than a decade of use of these medications, however, studies have not yet established their safety, and there have been repeated reports of elevated rates of breast and ovarian cancer in women exposed to multiple cycles of these medications.22 The risks for children produced from eggs exposed to these drugs are unknown.

Embryo research can contribute to reducing these risks in many ways. *In vitro* studies on eggs and research embryos can shed light on the effects these stimulatory drugs have on embryo development. Development of the technologies of oocyte freezing and *in vitro* egg maturation would make it possible to avoid entirely *in vivo* stimulation of a woman. By permitting clinicians to remove a large store of immature eggs from a woman's ovaries and develop them *in vitro* to the point of fertilization competence, this technology could spare women the effects of stimulatory medications while simultaneously improving the efficiency of reproductive procedures. These research goals require both embryo research and a willingness to perform the initial research on embryos not intended for transfer.

Research might also reduce the risks to children produced through infertility procedures. Because of a lack of resources for coordinated multi-center studies of assisted reproductive techniques, some newer procedures like ICSI, assisted hatching, or oocyte reconstruction via nuclear transfer have been introduced with little or no prior research into their safety for the resulting offspring. Not surprisingly, one recent study indicates that there is a slight but significant increase in the rate of spontaneous sex-chromosome anomalies among children born as a result of ICSI as

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22 See Mary Anne Rossing et al., *Ovarian Tumors in a Cohort of Infertile Women*, 331 N. ENG. J. MED. 771, 776 (1994) (concluding that the use of clomiphene, an infertility drug, may increase the risk of an ovarian tumor); Alice S. Whitemore et al., *Characteristics Relating to Ovarian Cancer Risk: Collaborative Analysis of 12 U.S. Case-control Studies*, (pts. 1, 2, 4), AM. J. EPIDEMIOLOGY 1175, 1184, 1212 (examining the relationship between certain reproductive and hormonal characteristics and ovarian cancer); Robert Spirtas et al., *Fertility Drugs and Ovarian Cancer: Red Alert or Red Herring*, 59 FERTILITY & STERILITY 291 (1993) (analyzing a study which linked the use of fertility drugs with ovarian cancer).
compared with the general neonatal population.23 In all these areas, studies utilizing human embryos can help answer safety questions and improve the success rates of existing procedures.

The need to transfer multiple embryos to increase the chances of a pregnancy also carries major risks for the resulting children. In Europe and the United States, IVF has resulted in a great increase in the number of higher order multiple births with their associated toll of birth defects and prematurity.24 Some have characterized this as a virtual epidemic that has boosted the census in neonatal intensive care units (NICU) around the world and resulted in a flood of NICU graduates with serious health problems and enduring disabilities. Parents unwilling to face these risks have sometimes opted to terminate one or more fetuses, a procedure with its own toll of medical risks and moral and psychological suffering. It can be argued that the problem here lies with infertility medicine, not a lack of embryo research. Some have criticized this whole area as stimulating unnecessary expectations on the part of infertile people and as seeking to satisfy a desire for one's own offspring that is not a valid aim of medicine.25 I believe these criticisms are wrong. Infertility medicine is just as legitimate as most other medical services currently provided and widely accepted. Wherever one stands in this debate, however, there is little doubt that IVF will continue to be widely used and that the risks to children will be ongoing. Embryo research can help reduce these risks. By improving our ability to identify "implantation competent" embryos, we can help reduce the need for multiple embryo transfers.26 The health benefits of this research are undeniable, immediate, and very significant.

Finally, I note that the ban on federal funding for embryo research has served to stimulate the entry of biotechnology corporations into this area. In the absence of federal support, leading sci-


25 See GENA Corea et al., MAN-MADE WOMEN: HOW NEW REPRODUCTIVE TECHNOLOGIES AFFECT WOMEN 12 (1987) (discussing the repercussions of reproductive technology); see also BARBARA KATZ ROTHMAN, RECREATING MOTHERHOOD: IDEOLOGY AND TECHNOLOGY IN A PATRIARCHAL SOCIETY 74-81 (1989) (discussing the concept of having a child of one's own).

cientists have turned to venture capital as a source of funding for their work. In November 1998, scientists funded by Geron Corporation in Menlo Park, California, announced that they had developed ways of producing embryonic stem cells by fertilizing ova left over from infertility procedures. Stem cells like these are capable of producing a host of bodily tissues for transplantation. Less than a week later, researchers at Advanced Cell Technology, a company based in Worcester, Massachusetts, announced that they had produced human stem cells by inserting the nuclei of human somatic cells into enucleated cow eggs. This cloning-related technique promises to expedite greatly the production of histologically compatible stem cells for human tissue repair research, even as it raises wholly new ethical questions about the appropriateness of creating such transgenic embryos. Each company sought to assure the public that there was ethical oversight of its work. In addition to requiring IRB approval of the research, for example, Geron formed a special ethics review board of its own to establish research guidelines. These guidelines were based upon the work of the Human Embryo Research Panel, but unlike those proposed for federally funded research, such corporate initiatives are entirely voluntary. Since commercial interest in embryo research will undoubtedly grow in the future, the withdrawal of federal funding means a corresponding loss of federal ethical oversight.

IV. HOW ARE WE MORALLY TO ASSESS THIS HISTORY OF RESEARCH OBSTRUCTION?

Most recent objections to embryo research stem from positions that view the early embryo as a research subject meriting all the protections afforded live-born children. Although some people who accept the right of abortion have opposed forms of embryo research and the use of research embryos, the community of those opposed to embryo research largely overlaps with the “right-to-

27 See Nicholas Wade, Scientists Cultivate Cells at Root of Human Life, N.Y. TIMES, Nov. 6, 1998, at A1 (explaining the process by which stem cells from in vitro human embryos are being used to produce organs and aid in gene therapy, while examining the ethical considerations).

28 See Nicholas Wade, Researchers Claim Embryonic Cell Mix of Human and Cow, N.Y. TIMES, Nov. 12, 1998, at A1 (explaining how a company has engineered a human cell to its primordial, embryonic state by fusing it with cow eggs, and discussing the ethical considerations of human embryonic research).

29 See Andrew Pollack, Small Company Gains High Profile in the Scientific World, N.Y. TIMES, Nov. 6, 1998, at A24 (explaining how Geron Corp. started and developed as a medical research company).
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life" or anti-abortion movement. As a member of the Human Embryo Research Panel, I can report that almost every speaker who appeared before us opposing embryo research, as well as the organizations seeking to block NIH funding for this research, held anti-abortion views. Those identified with this position regard the embryo as morally equivalent to any other child or adult human subject and believe that it cannot be involved in research procedures that expose it to risk of injury or death unless these risks are directly related to increasing the embryo's chances of survival. For many who hold this view, it is irrelevant that the embryo may otherwise be doomed, as is the case of many frozen spare embryos remaining from infertility procedures that will eventually be thawed and discarded. Such embryos are viewed by those holding this position as dying persons who cannot be subjected to harmful procedures without their consent. Proxy consent by parents is also presumably unacceptable in such cases since the law and ethics of pediatric research normally permit parental permission for research only when very low degrees of risk are involved.

Clearly, this position on the status of the embryo cannot legally be a basis for banning embryo research in the United States. Under U.S. law, the early embryo is not a juridical person. It is considered to be bodily tissue under the control of its progenitors. If a woman or couple wishes to donate gametes or embryos for the purposes of embryo research, there would be major constitutional obstacles preventing them from doing so, as some lower court rulings have already implied. Without rehearsing here the complex moral debate on human personhood and moral entitlements, I believe that a very strong case can also be made that these legal conclusions are ethically appropriate. The early embryo lacks most

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30 Critics of embryo research who take this position do not usually indicate what levels of risk this implies. One encounters here the complex philosophical question of whether being born is itself a good for which it is worth assuming a substantial risk, including the risk of illness and disability. This is sometimes called the "non-identity" problem and has been widely discussed in connection with the work of the philosopher Derek Parfit. See Derek Parfit, Reasons and Persons 351-79 (1984). The National Bioethics Advisory Commission identified this philosophical problem and (properly, I believe) chose to bypass it in its assessment that current risk levels ruled out efforts to clone a human being. See 1 CLONING HUMAN BEINGS: REPORT AND RECOMMENDATION OF THE NATIONAL BIOETHICS ADVISORY COMMISSION, supra note 4, at 65 (arguing that cloning should be prohibited at the present time because it involves unacceptable risks). For a discussion of my own views on the basis and extent of our obligation to protect born children from harm, see Ronald M. Green, Parental Autonomy and the Obligation Not to Genetically Harm One's Child Genetically, 25 J. L. MED. & ETHICS 5 (1997).

31 See Lori B. Andrews, supra note 18, at 303-05.
of the qualities normally associated with the possession of basic human rights. It is unreasonable to believe that its claims outweigh those of its parent-progenitors or the health and safety of born children and adult women. It follows that infertile couples wishing to donate embryos for research aimed at improving the safety and efficacy of procedures in which they are involved or for similar biomedical research purposes should have the right to do so. Individuals or couples with a different view of the moral status of the embryo should be permitted to withhold their own embryos from such uses. They also have the right to try to persuade others of their views. But they have no moral right to prohibit others from donating their embryos for these purposes or to limit the right of scientific researchers to pursue worthy areas of investigation. This suggests that legal efforts to ban privately funded embryo research are unjust and constitute a violation of public ethical responsibility in a pluralistic democracy.

This leaves for ethical analysis only the very complex issue of federal funding of embryo research. The consequences of efforts to stop such funding are serious. The reduced progress of infertility medicine and the potential iatrogenic and other health problems that I have mentioned stem from the absence of federal funding. As currently conducted, most embryo research takes place within the context of privately supported infertility programs where the resources for systematic and comprehensive research are extremely limited. Most infertility programs depend on patient fees for financial support, leaving little room for research activities. The focus on helping couples also drastically reduces the numbers of embryos available for research, since most couples are unwilling to donate embryos while caught up in the effort to establish a pregnancy. One solution to this is multi-center studies that increase the number of embryos available for research, but such studies require administrative coordination and financial support. With more than three hundred infertility programs, in numerical terms the United States is now the world’s leading provider and consumer of infertility services.\textsuperscript{32} The absence of federal funding for multi-center studies is thus disproportionate to the amount of clinical activity underway.

In my view this situation is ethically unacceptable. It is unethical to offer clinical medical services without simultaneously engaging in the research needed to establish the efficacy and safety of those services. In addition, a pluralistic democracy committed to protecting and improving the health of its citizens cannot justly exclude one area from its research support merely because that area is objected to by some of its citizens on the basis of their personal religious and moral beliefs. Unless these religious and moral objections can be grounded in concerns relevant to a pluralistic democracy — and this means reasonably clear issues of public health and safety — they must be set aside.

I realize that this position is not self-evident, and that I must defend it. In doing so, I want first to dismiss as untenable the view that no citizen should have to pay taxes for governmental research activities to which she or he morally objects. This position, repeatedly expressed by presenters before the Human Embryo Research Panel who objected to embryo research, makes no sense ethically or legally. It is unreasonable and unworkable to subject funding decisions, once made, to the multiple vetoes of dissenting citizens or to ask only those in favor of specific public goods to pay for them. Having to pay for programs with which we ethically disagree is one consequence of living in a democracy.

Far more serious is the view that the federal funding of health-related research programs can and should be made a matter of majority decision. This, I take it, is the position of those who believe that Congress has acted justly in banning NIH funding of human embryo research. Those who hold this view appear to believe that the federal government and federal research establishment can properly be dictated to regarding the programs they choose to support primarily by the will of a majority of the people. For those holding this view, issues of scientific merit or the likely contribution of a research area to public health take a back seat to preferences of voters. In addition, they see nothing wrong if these preferences happen to be shaped by religious and moral views that are not sustainable in terms of widely shared, public moral considerations.

I believe this position is mistaken. Health-related research can be a matter of life and death. In a just society, its direction and governance is of the highest importance — in some instances on a par with matters of basic constitutional liberties. It cannot be made a matter of majority whim. This means that once a decision has been made to fund health-related research, priority determinations among research programs should be made in terms of scientific
and public health considerations. This includes the use of independent panels for peer review of the science and the use of other multidisciplinary panels for assisting in policy decisions based on the merit and worth of research directions. Public opinion can play a role in this process and should by no means be excluded from it. Recent AIDS and breast cancer activism shows that insulated federal panels can sometimes undervalue important research areas and themselves become instruments of insensitive or discriminatory majoritarian sentiments. Activists can awaken those involved in these panels to their larger responsibilities. But political pressures from any side must be filtered through a review process that privileges scientific information and that identifies and promotes valid public interests.

Reasoning by all those involved in these policy determinations must proceed on the basis of what one writer has called "public reason." This means using arguments that appeal to basic and widely shared human values and avoid appeal to religious or moral claims not sustainable on common sense or evidential grounds. Public values are those values necessary for the pursuit of human ends in general. They include values like protection from physical harms, liberty to pursue one's ends (including religious ends consistent with other values), and access to at least a minimum of financial goods needed and other means to be a participating member of the social order. Among these goods are the benefits of publicly funded health-related research. The requirement that policy determination of such values be independent of particular religious, theological, or philosophical beliefs does not exclude the possibility that people's views may be deeply influenced by such beliefs. However, once the public discussion of policies begins, these beliefs must be capable of being articulated in terms of the kinds of widely shared values that I mentioned. Finally, when actual issues, consequences, and claims are in dispute, public discussion requires a weighing of arguments in the light of reasoned analysis, the best available information and, where it is available, scientific knowledge. Religious claims that cannot sustain themselves in these terms should not play a role in these discussions.

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These general considerations apply to the issue of embryo research. Currently, whole classes of research related to public health and safety are supported by federal funds. Much of this funding goes to areas that involve less risk to individuals than does the field of reproductive medicine. To deny support of embryo research amounts to unjustified political intervention in the research prioritizing and funding process. It also amounts to arbitrary discrimination against the women and children affected by poorly researched reproductive medical procedures. Furthermore, this discrimination is largely motivated not by reasonable public concerns related to health and safety, but by publicly unsustainable religious and ethical objections.

A hypothetical illustration suggested by the Swiss moral philosopher Alex Mauron might help make the injustice of these efforts more clear. Mauron asks us to think through the ethical challenges surrounding those who hold idiosyncratic moral beliefs by considering the situation of Jain religious believers living in a liberal, pluralistic, and non-theological society. As a matter of deep religious conviction, Jains hold an extreme reverence for life. They are strict vegetarians. Some devout Jains will sweep the ground before them while walking to avoid killing small bugs. Imagine, now, that Jains constitute a substantial part of the population of the United States. To what extent should public policy respect their position? To what extent should their position influence the course of biomedical research?

Mauron answers the first of these questions by observing that, although the minority point of view that Jains represent cannot be summarily dismissed, it should not be made a basis of public policy. In a society that values pluralism, such as ours, Jains should certainly be free to practice their beliefs. They should also be free, Mauron observes, “to try and persuade the rest of us to see things their way.” Nevertheless, “they cannot impose their views on non-believers if they want to be peaceful participants in a secular social order.” Attempting to do so would impose many serious risks on

34 See Alex Mauron, The Human Embryo and the Relativity of Biological Individuality, in CONCEIVING THE EMBRYO: ETHICS, LAW AND PRACTICE IN HUMAN EMBRYOLOGY 55, 66-67 (Donald Evans ed., 1996) (discussing how the concept of the individual is more an operational way to deduce moral decisions about the human embryo, but does little to explain the concept substantively).

35 Jainism, founded in India in the 6th century, B.C., teaches immortality and transmigration of the soul. See AM. HERITAGE DICTIONARY, supra note 12, at 685.

36 Id. at 67.
non-believers (including exposure to disease or starvation) without their consent and in the absence of reasons of compelling validity to everyone. The parallel here to our own public reasoning about the abortion question is clear. Legal impediments to abortion based on strong views of fetal rights similarly represent the imposition of serious risks on non-believers without their consent and in the absence of reasons of compelling validity to everyone.

Carrying this illustration a bit further, imagine that members of the Jain minority have reluctantly agreed to accept this legal and ethical status quo. Although they practice extreme reverence for life (and even try peacefully to convert others to their beliefs), they have decided for political and perhaps ethical reasons to respect practices and institutions related to the use of animals for food by other citizens. One such institution is the research on animals needed to establish the safety of the food supply. This might include the administration of certain food additives or drugs to research animals that are subsequently slaughtered for pathological analysis. Consider, now, the ethical implications if some Jain militants, unreconciled to the public rejection of their views, undertook a campaign to block the use of animals in research. They might try to argue that this research is not needed, that it is socially dangerous because it erodes other widely shared values, or they might openly argue from Jain premises that it is morally wrong. This campaign, I believe, would be morally flawed in at least four respects. First, it would violate the basic requirement of public ethics in a pluralistic democracy that one not use the law to try to impose one’s non-publicly sustainable views on others. Second, it would be dishonest. Unable to make a case for mandatory vegetarianism at the highest levels of public policy, these anti-research activists would now be trying to accomplish their ends by means of a “back door” approach at a point where public scrutiny of the issues involved is likely to be less intense. Third, if this tactic proved successful, it would impose special harms on people consuming animal products and might selectively injure those, the poor or uneducated, who are unable to protect themselves by privately funded safety research. A final objection to this tactic is that it corrupts the integrity of an independently established scientific review process.

Analogies, Plato tells us, walk on weak legs. Some will dispute that this imaginary illustration accurately parallels what has transpired in the area of embryo research. I believe, however, that it represents, point for point, a fully accurate description of the basic moral issues and dynamics that have characterized this area.
STOPPING EMBRYO RESEARCH

That this seems less evident to some people, I believe, can be traced primarily to two factors. One is the absence of public familiarity with the urgent health and safety issues associated with human embryo research. Lacking this understanding, which I and other members of the Human Embryo Research Panel developed over months of reading and listening, it is easy to dismiss embryo research as a marginal activity related to a marginal and wholly optional area of medical care, infertility medicine. I have tried to suggest that this estimate is seriously mistaken. A second factor contributing to the lack of urgency about obstruction of embryo research is the widespread opposition to abortion in our society and the willingness of many people to tolerate whatever tactics further this opposition.

Other factors have played a contributory role to this history of obstruction. Foremost among these, I suspect, is a widely shared sense of discomfort with scientific intrusions in heretofore sacrosanct areas of reproduction. This discomfort has manifested itself very clearly in public debates surrounding cloning, where even liberal and progressive religious spokesmen have gone on record as opposing tampering with the sources of human developmental individuality and the dynamics of human parenting.

In the area of embryo research, this broad opposition to manipulating life’s beginnings finds expression in the very negative reception given the Human Embryo Research Panel’s recommendation that scientists be permitted deliberately to create and use research embryos. This single recommendation was widely criticized in the press and eventually afforded the Clinton White House, which rejected this proposal, with an opportunity to stake out a “moderate” position in the policy debate.

I will not here rehearse the many reasons why I believe this opposition to the use of research embryos is unjustified. The Embryo Research Panel’s report details the many urgent and important health issues that only studies based on the use of research embryos can help us address. The ethical arguments for distinguishing between spare embryos and research embryos also do not strike me as withstanding close scrutiny. This left an array of symbolic considerations as the principal source of concern. These include the seeming violation of the Kantian injunction never to use human beings as “means only,” and the fear that this practice, innocuous in itself, might lead to a more widespread instrumentalization of human life. While recognizing the legitimacy of these symbolic considerations, eighteen of nineteen panel members con-
cluded that they are not weighty enough to warrant a prohibition of research embryos.

I mention this debate because it suggests that concerns about tampering with the sanctity of human life and parenthood do play a contributory role in current efforts to stop life sciences research. But, often, they are not the decisive consideration. Rather, the greatest energy for this opposition is drawn from the two previous factors that I mentioned: lack of sound knowledge of the implications of research obstruction, and opposition to anything linked to abortion.

Those who wish to preserve the freedom of life sciences research in the areas of reproductive medicine and genetics must understand this array of forces. They must increase public understanding of the scientific and medical stakes by improving public education in these areas. They must strive politically and administratively to create a more protected environment for expert panels in the policy process. Like other elements of our federal system, for example, the Federal Reserve and FDA, scientific research must be insulated from direct and unmediated control by powerful political interest groups. Those wishing to preserve the freedom of life science research must also work to counter the often-veiled anti-abortion activism that intrudes on the policy process in these areas, and they must make the public aware of the ethical implications of such intrusions. Above all, they must help renew our understanding of the ethical responsibilities we all share as citizens in a pluralistic democracy. Personal dislike of research in a particular area, however sincerely motivated, must take second place in all our thinking to respect for the independence of the scientific research process and the protection of public health and safety.