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Human Embryonic Stem Cell Research: An Intercultural Perspective

ABSTRACT. In 1998, researchers discovered that embryonic stem cells could be derived from early human embryos. This discovery has raised a series of ethical and public-policy questions that are now being confronted by multiple international organizations, nations, cultures, and religious traditions. This essay surveys policies for human embryonic stem cell research in four regions of the world, reports on the recent debate at the United Nations about one type of such research, and reviews the positions that various religious traditions have adopted regarding this novel type of research. In several instances the religious traditions seem to have influenced the public-policy debates.

The successful creation of human embryonic stem cells in 1998 opened the door to an important new area of biomedical research (Thomson et al. 1998). The combination of human embryonic stem cell (HESC) research with the technique of somatic cell nuclear transfer, or cloning—first described in a mammal in 1997 (Wilmut et al. 1997)—provided scientists with additional research options. In the short run, HESC research—including cloning research—is likely to facilitate the understanding of normal and abnormal cell differentiation and human development, including a better understanding of disease. In the longer term, researchers hope to provide new approaches to therapy for diseases like juvenile onset diabetes or Parkinson's disease and for injuries to the brain or spinal cord.

The novel research techniques reported in 1997 and 1998 gave new impetus to an ethical discussion that had begun in earnest in 1978—the year that the first infant born following *in vitro* fertilization (IVF) was born. The debate about research involving human embryos was conducted in multiple countries and cultures during the late 1970s, the 1980s, and the early 1990s. HESC research introduced subtle but important changes

into this ongoing debate. First, the research involved the cultivation of embryos for a definite number of days and to a distinct stage of preimplantation development—for five days and to the early blastocyst stage. Second, the new stage of human embryo research was not focused primarily on assisting or preventing fertilization but rather on understanding and eventually treating serious diseases and injuries. Third, HESC research provided a new tool for basic science, with broad potential application in genetics and developmental biology. In particular, the technique of introducing human embryonic stem cells into laboratory animals like mice made possible the long-term study of how cells differentiate to become particular types of cell, for example, nerve cells.

Numerous nations, states, cultures, and religious traditions have considered it important to review their policies and moral judgments on human embryo research in the light of these new developments. The present article seeks to review this seven-year discussion, to identify the major policy options that have been adopted, and to examine how major religious traditions have responded to the new technical possibilities while also contributing to the public-policy debate.

Six policy options regarding human embryonic stem cell (HESC) research have been adopted in the various nations and cultures of the world. I begin by summarizing the six options, then attempt to characterize the policies adopted in four major regions of the world: Europe, the Middle East, Asia and the Pacific Rim, and North America. I also review the recent debate at the United Nations on cloning for reproduction and cloning for biomedical research. Finally, I explore how several major religious traditions have responded to the question of HESC research and enquire whether the diverse religious perspectives on HESC research correlate, at least in part, with national policies regarding the research.

SIX POLICY OPTIONS

In the following analysis, I distinguish among six possible policy options regarding human embryo research and HESC research:

Option 1: No human embryo research is permitted, and no explicit permission is given to perform research on existing human embryonic stem cells;

Option 2: Research is permitted only on existing human embryonic stem cell lines, not on human embryos;

Option 3: Research is permitted only on remaining embryos no longer needed for reproduction;

Option 4: Research is permitted both on remaining embryos (see Option 3) and on embryos created specifically for research purposes through *in vitro* fertilization (IVF);

Option 5: Research is permitted both on remaining embryos (see Option 3) and on embryos created specifically for research purposes through somatic cell nuclear transfer into human eggs or zygotes; and

Option 6: Research is permitted both on remaining embryos (see Option 3) and on embryos created specifically for research purposes through the transfer of human somatic cell nuclei into nonhuman animal eggs, for example, rabbit eggs.

POLICIES BY REGION

Europe

Within Europe, the United Kingdom (U.K.) has, since 1990, adopted the most liberal policies regarding HESC research, accepting both Options 4 and 5. In April 2003, Belgium joined the U.K. and allowed the creation of embryos for research purposes, either through *in vitro* fertilization or nuclear transfer. Sweden seems to be moving step-by-step toward a similar policy. On the opposite end of the spectrum, several European nations prohibit all human embryo research and do not expressly permit research with already-existing human embryonic stem cells (Option 1). The conservative nations at present include Austria, Ireland, Italy, Norway, and Poland. One nation, Germany, has adopted Option 2; it permits the importation and use of human embryonic stem cells that were derived outside Germany before 1 January 2002 (Option 2, with a time limit). A majority of European nations accept, or are likely to accept, the use for HESC research of remaining (or supernumerary) embryos that are no longer needed for reproduction (Option 3). The Czech Republic, Denmark, Finland, Greece, Hungary, the Netherlands, Russia, and Spain have adopted Option 3, either explicitly or *de facto*. France and Switzerland are gradually moving toward the acceptance of Option 3—although HESC research is a contentious issue in both of the nations. In Belgium, Denmark, Germany, Greece, Spain, and the U.K., HESC research policies were liberalized between 2001 and 2003. France and Switzerland are likely to adopt more permissive policies in 2004.

Given the division of opinion among European nations, it is not surprising that the European Union (EU) has had difficulty achieving consensus on whether it will *fund* HESC research through its joint 2002–2006 program, officially called the 6th Research Programme. In December

2003, there was a virtual stalemate on this question, with Austria, Germany, Italy, and Portugal favoring a variation on Option 2, and most other EU members advocating Option 3. The European Parliament voted for Option 3 by a 291–235 margin in November 2003, but the ministers of the European Commission have not been able to resolve the issue (Minder 2003; Research 2003). The 6th Research Program of the EU began funding new projects in January 2004, but it is not clear whether HESC research proposals will be eligible for funding under the program. Of course, what research the EU funds or does not fund has no bearing on what research is *legally permitted* within each of the 15 EU member states.

Two additional factors in the European debate are worth noting in passing. Most European nations have considered and some have ratified the April 1997 Council of Europe Convention on Human Rights and Biomedicine. The convention specifies that “The creation of embryos for research purposes is prohibited” (Paragraph 18.2). Thus, nations that have ratified this convention have legally bound themselves not to adopt Option 4, and presumably not to adopt Option 5, as well. Nations like the U.K. that have adopted Options 4 and 5 either do not ratify this convention or formally signal their reservations to provisions like Paragraph 18.2 during the ratification process. After the successful cloning of a sheep in 1997, the Council of Europe adopted, in January 1998, an “Additional Protocol” to this convention “on the Prohibition of Cloning Human Beings.” This additional protocol, also ratified by numerous nations in Europe, was limited explicitly to a ban on *reproductive* cloning.

The Middle East

Israel

Since 2000, Israel has been one of the world leaders in HESC research. A law adopted in December 1998 (Law 5759–1999) prohibited reproductive cloning but implicitly permitted research cloning (Option 5). In August 2001, the Bioethics Committee of the National Academy of Sciences and Humanities of Israel recommended that the nation accept Option 5 but reject Option 4, arguing that remaining embryos from infertility clinics should obviate the need to create embryos for research purposes by means of IVF. In response to the Bioethics Committee report, the Ministry of Health empowered the National Helsinki Committee for Genetic Research in Humans to review applications involving either the use of remaining embryos from infertility clinics (Option 3) or the creation of

human embryos through somatic cell nuclear transfer (Option 5), provided that the guidelines of the Bioethics Committee report were followed. As of December 2003, the Helsinki Committee had approved one research proposal involving remaining embryos; however, it had not yet approved any protocols involving nuclear transfer. In early 2004, renewal of the December 1998 law, with possible modifications to the duration of the ban on *reproductive* cloning, was being considered by the Knesset (personal communications from Michel Revel, Weizmann Institute of Science, Rehovot, Israel, 16 December 2003 and 16 January 2004, and from Zelina Ben-Gershon, National Helsinki Committee, 17 December 2003 and 16 January 2004; see also Gilbert 2004).

Iran

During the summer of 2003, Iranian scientists at the Fertility Research Centre, an affiliate of the University Jihad Institute, announced that they had succeeded in creating human embryonic stem cells. This achievement was celebrated by the Iranian government. On 2 September 2003, Ayatollah Ali Seyyed Khamenei, Supreme Leader of the Islamic Revolution, publicly received and congratulated the scientists who had produced the cells (British Broadcasting Corporation 2003).

Asia and the Pacific Rim

In this region, China, for many years, has adopted the most liberal policies. Alone among the world's nations, it has permitted scientists to transfer human nuclei into animal eggs (Option 6). Singapore is moving toward the acceptance of Options 4 and 5, and Japan is debating whether to accept Options 4 and 5, as well as the currently-accepted Option 3. Australia, which earlier had been characterized by diverging policies in the various states, achieved a national consensus on Option 3 (with a time limit) in December 2002. India has apparently adopted Option 5, *de facto*. Taiwan has accepted Option 3 without legislation.

China

The first advisory-group opinion that justified Option 6 was adopted originally in China in October 2001. The opinion, formulated by the Ethics Committee of the Chinese National Human Genome Center at Shanghai (2001), states that the transfer of human nuclei into nonhuman mammalian eggs should be permitted as a basic research procedure.

4. Use of the “human-animal” cell fusion technique is permissible in basic research with non-clinical application if the requirements expressed in the first three points of the present Article 14 are satisfied. However, use of the product formed by combining a human somatic cell nucleus with the oocyte cytoplasm of an animal using the “human-animal” cell fusion technique is strictly forbidden in therapeutic cloning research for clinical application in the treatment of human diseases. (Article 14.4)

A second set of proposed guidelines was developed during the same year by an interdisciplinary group of scientists and ethicists in Beijing. The Beijing ethical principles, drafted for China’s Ministry of Health and Ministry of Science and Technology, also permit somatic cell nuclear transfer into human eggs (Option 5) and into animal eggs (Option 6) (Döring 2003). In August 2003, a research group led by Huizhen Sheng at the Shanghai Second Medical University reported that it in fact had succeeded in producing human embryonic stem cells following the transfer of human nuclei into rabbit eggs (Chen et al. 2003; Dennis 2003).

New administrative regulations for assisted reproductive technologies in China were announced by the Ministry of Health on 10 July 2003, and went into effect on 1 October 2003. These rules seem to apply only to situations in which embryo transfer is contemplated. In that context, nuclear transfer, as well as ooplasmic transfer, into human oocytes is forbidden. (personal communication from Ole Döring, Ruhr-University Bochum, 17 December 2003). These clinical guidelines do not seem to apply to basic research involving human sperm, oocytes, or embryos.

Singapore

Since 2000, this city-state has conducted a comprehensive public review of HESC research. Singapore’s Bioethics Advisory Committee produced a comprehensive report in June 2002 entitled *Ethical, Legal, and Social Issues in Human Stem Cell Research, Reproductive and Therapeutic Cloning* (Singapore 2002). Discussion of the issue has continued since the report’s publication, and in November 2003 the Minister of Health placed a draft law regarding HESC research policy on the Web, soliciting further public comment. Both the Bioethics Advisory Committee report and the draft law accept the creation of embryos for research purposes through in vitro fertilization (Option 4) and through nuclear transfer into human eggs (Option 5) when important research cannot be accomplished using remaining human embryos. The report and draft law also foresee the

establishment of a central oversight authority to review and license individual HESC research proposals in Singapore.

Japan

In November of 2000, the Japanese Diet enacted “The Law Concerning Regulation to Human Cloning Techniques and Other Similar Techniques.” This law clearly prohibits reproductive cloning but does not seem to ban any of the numerous research techniques discussed in this essay. On an independent track, research guidelines for HESC research were drawn up by an advisory committee for the Ministry of Education, Science and Technology, and were released in September 2001. These guidelines permit only research with remaining embryos that have been produced through in vitro fertilization (Option 3) (personal communication from Yutaka Hishiyama, National Graduate Institute for Policy Studies, Tokyo, 30 December 2003).

In 2003, a renewed public debate began when several Japanese scientists requested that the guidelines be liberalized. At a December 2003 meeting, the Bioethics Committee of the Council for Science and Technology Policy in the Cabinet Office released an interim report recommending that the production of embryos for research through IVF be permitted for limited purposes, such as the study of hereditary diseases (Option 4, with restrictions). On the question of research cloning (Option 5), Committee opinion was sharply divided. Approximately half of the Committee’s members advocated that research cloning be permitted, citing possible benefits for regenerative medicine. The other Committee members either advocated a delay in permitting research cloning or expressed their opposition in principle to this research technique (Arita 2003). The Committee’s interim report was released for public discussion, in light of which the Committee will compile its final report (Japan Economic Newswire 2003).

Taiwan

HESC research has received substantial public attention in Taiwan. After a series of three public hearings the Ministry of Health published guidelines for the conduct of such research in February 2002. According to the guidelines, “surplus” embryos that are no longer needed for reproduction may be used for stem cell research. However, donor eggs and sperm are not to be used to create embryos for research purposes (Chen

2004, p. 10) Regarding research cloning, the Ministry deferred a decision, saying: “The issue of producing human embryos for research purposes through nuclear transfer should be examined in greater detail because in this case multiple realms are involved” (Chen 2004, p. 10).

In December 2003, the Committee on Science and Technology of the Taiwanese Parliament was presented with two draft laws on human embryo research and HESC research. However, neither of these bills received substantial discussion because the opposition parties were at that time blocking consideration of all bills being proposed by the ruling party. After the presidential election in March 2004, further debate on the drafts is expected (personal communication from Professor In-Chin Chen, Ming-Chuan University, 19 December 2003).

India

National human embryo research policies in India initially were laid out in a detailed set of research guidelines published by the India Council of Medical Research (ICMR) in September 2000 (ICMR 2000). These guidelines specified that research should not be done beyond the 14-day stage of embryonic development, excluding periods of cryopreservation. In September 2001, a National Bioethics Committee appointed by the government’s Department of Biotechnology published a more detailed set of guidelines entitled “Ethical Issues and Consent Process Pertaining to Stem Cell Research” (Mudur 2001; India, Department of Biotechnology 2001, p. 1). This second document distinguished between “stored or spare embryos obtained from infertility treatment” and “embryos produced for research purposes (including somatic cell nuclear transfer)” (India, Department of Biotechnology 2001, p. 1). The guidelines then stipulated that “The creation of embryos solely for research purposes should not be undertaken” (India, Department of Biotechnology 2001, p. 1). Thus, both sets of guidelines seemed to embody Option 3.

However, in 2003, the question of research cloning was raised anew by scientists and by a spokesperson for the ICMR. According to Vasantha Muthuswamy, Senior Deputy Director of the ICMR, the Council had drafted legislation to update Indian policies. Dr. Muthuswamy was quoted by the newspaper *The Hindu* as saying that “[T]he general opinion was in favour of allowing ‘therapeutic cloning’ which enabled the cloning of human organs” (Decision 2003). Thus, the ICMR seemed to espouse legal approval of Option 5 as well as Option 3. In January 2004, Professor D. Balasubramanian, a researcher at the L.V. Prasad Eye Institute, ex-

pressed the opinion that somatic cell nuclear transfer using human cells and oocytes is not legally banned in India (personal communication, 23 January 2004). Dr. B. M. Gandhi, Advisor on International Collaboration to the Department of Biotechnology, has confirmed that individual proposals to perform “therapeutic cloning” can be considered on a case-by-case basis if they are then also approved by the National Bioethics Committee (personal communication, 11 February 2004). A group appointed to formulate legislation for the Indian government forwarded its report to the parliament at the end of 2003 (personal communication from Lori Knowles, University of Alberta, 23 January 2004).

South Korea

Since late 2000, the South Korean government has sought to develop a national policy on HESC research. In July 2001, after holding public hearings on this issue, the Korean Bioethics Advisory Committee (KBAC) submitted a series of policy recommendations to the Ministry of Science and Technology (personal communication from Young-Mo Koo, University of Ulsan College of Medicine, 20 October 2003). These recommendations stipulated that “Research utilizing . . . frozen human embryos that would be discarded is allowed for a certain period of time, but researchers should obtain informed consent from both the egg and the sperm donors” (personal communication from Koo, 20 October 2003). The creation of embryos for research through IVF or somatic cell nuclear transfer was rejected. Thus, the recommendations clearly tracked Option 3. In the years 2002 to 2003, four contrasting bills were introduced into the Korean legislature, two liberal bills that would have permitted research cloning (Option 5), an intermediate bill that paralleled the recommendations of the KBAC (Option 3), and a conservative bill that would have prohibited all human embryo research (Option 1) (personal communication from Koo, 20 October 2003). According to Professor Young-Mo Koo (personal communication, 20 October 2003), the liberal bills also could have been interpreted to permit cross-species nuclear transfer (Option 6).

In late December 2003, the Ministry of Health and Welfare’s Bioethics and Biosafety Bill was passed by the National Assembly. This extensive legislation, consisting of 55 articles covering 30 pages, includes two articles comprised of two clauses each on HESC research (personal communication from Koo, 30 December 2003). The new law prohibits reproductive cloning and routinely permits the use for research of remaining embryos that have been kept frozen for at least five years (Option 3) (Ji-

Young 2003). The South Korean government also will allow limited research involving nuclear transfer (Option 5), under guidelines to be developed by a newly-created National Ethics Committee (Ji-Young 2003). Research cloning experiments will require the formal approval of the South Korean President. The prohibition of reproductive cloning will go into effect immediately, whereas the new guidelines for HESC research will become effective 1 January 2005 (personal communication from Phillan Joung, Ruhr-University Bochum, 12 January 2004).

In February 2004, South Korean researchers at Seoul National University stunned the world by announcing that they had successfully used research cloning techniques to produce human embryonic stem cells (Hwang et al. 2004).

Australia

After several years of debate and in the face of radically differing policies at the state level, the Australian Council of Governments agreed on a unified policy on HESC research in April 2002. The consensus policy, Option 3 with a time limit, was formally enacted into law in two bills adopted in December 2002—after a long and somewhat contentious debate on the precise rules for HESC research. Under the terms of the Research Involving Human Embryos Act 2002, embryos used in research must have been created before 5 April 2002 in order to qualify as “excess” embryos. The law is administered by a nine-member, interdisciplinary Licensing Committee located within the National Health and Medical Research Council. The structure and functions of the Licensing Committee are in most respects analogous to those of the U.K. Human Fertilisation and Embryology Authority (O’Malley 2002; Australia 2002).

North America

Canada

Since the completion of a comprehensive report on assisted reproductive technologies by a Royal Commission in November 1993, several sessions of the Canadian Parliament have attempted to enact legislation that would regulate both infertility services and human embryo research. Beginning in 2001, the effort to regulate human embryo research has proceeded along two parallel tracks: the Parliament has sought to pass broad legislation that encompasses various aspects of human reproduction, while the Canadian Institutes of Health Research (CIHR) have focused on the

narrower topic of HESC research. After publishing a discussion paper in March 2001, CIHR published “Human Pluripotent Stem Cell Research: Guidelines for CIHR-Funded Research” (CIHR 2002). The guidelines stipulate that Canadian researchers should use only remaining embryos in HESC research (Option 3). In the fall of 2003, CIHR took the additional step of appointing a Stem Cell Oversight Committee, which has begun evaluating individual research protocols (personal communication from Cynthia Cohen, Georgetown University, 31 January 2004; CIHR 2004). Meanwhile, a bill entitled “An Act Respecting Assisted Human Reproductive Technologies and Related Research” was approved by the House of Commons in October 2003 and by the Senate in March 2004. The new law will permit the use of remaining embryos in HESC research and will establish the Assisted Human Reproduction Agency of Canada to monitor infertility services and to license and oversee all human embryo research performed in Canada. The Canadian Parliament has thus formally endorsed Option 3 (Canada Newswire 2004).

Mexico

During the 2003 legislative year, the Chamber of Deputies in Mexico’s Parliament debated legislation about human cloning. In January 2003, the chair of the Chamber’s Health Commission, Maria Eugenia Galvan, announced that she would propose legislation to ban human cloning in Mexico. One month later, deputies from the Democratic Revolutionary Party (PRD) announced their intention to exclude research cloning from any ban on human cloning. The issue was debated by the Deputies in April 2003, and at year’s end, on 3 December, a bill banning both reproductive and research cloning was approved by the Chamber of Deputies (Paso a Senado 2003; Palacios 2003). The President of the Mexican Academy of Sciences and researchers at the National Autonomous University of Mexico (UNAM) responded immediately by vigorously criticizing the Chamber’s action (Macedo and Barba 2003).

United States

U.S. policy on HESC research can be described accurately as a patchwork of diverse policies at the state level plus a unified federal policy on the *funding* of such research. At the state level, 11 states have prohibited all human embryo research, including, one assumes, the derivation of human embryonic stem cells through the destruction of human blasto-

cysts (Option 1).¹ Two additional states (Arkansas and Virginia) have banned all human cloning, including research cloning (Option 5 prohibited). However, Option 3 is accepted implicitly in these two states, and Option 4 is not prohibited by their anticloning legislation. Two states (California and New Jersey) explicitly have endorsed research cloning (Option 5) and seem to permit the creation of embryos for research purposes through IVF as well (Option 4) (see Andrews 2004). In the remaining 35 states, none of the research options is prohibited by law. Thus, it would seem that Option 3, Option 4, Option 5, or even Option 6 would be legally permissible in those 35 states.

At the federal level, the current policy was established through a speech given by President George W. Bush on 9 August 2001. President Bush endorsed Option 2, with a time limit on the date by which the human embryonic stem cell lines must have been created—the date of the speech. Initial NIH estimates of 60–70 embryonic stem cell lines worldwide proved to be unrealistically high, and at the beginning of 2004 the number of stem cell lines that were well characterized, available to researchers, and derived before 9 August 2001 was officially listed as 15 (NIH 2004).

The United States Congress also has debated the question of human cloning in 2001, 2002, and 2003. Bills that would ban both reproductive and research cloning have been sponsored by Senator Sam Brownback (R-KS) and Congressman Dave Weldon (R-FL) in each of the past three sessions of Congress. This effort to prohibit both types of cloning has been endorsed publicly by the Bush administration. A competing bill that would outlaw reproductive cloning but permit research cloning (Option 5) has been associated most closely with the names of Senators Hatch (R-UT), Kennedy (D-MA), Feinstein (D-CA), and Spector (R-PA). The Weldon bill passed in the House in 2001 and again in 2003 by substantial majorities. However, neither Senate bill seems to enjoy the support of a filibuster-proof majority, and the Senate has not taken action on the issue of cloning (Walters 2003).

THE UNITED NATIONS DEBATE²

The global debate about human cloning includes two subtopics—human reproductive cloning and HESC research involving human somatic cell nuclear transfer into human eggs (here designated Option 5). In August 2001, France and Germany proposed to the U.N. General Assembly that an “international convention against the reproductive cloning of human beings” be developed and circulated to member states for their consideration. It is fair to say that the primary impetus behind the French-German

initiative was the concern that the few scientists and one religious group that were threatening to clone a human being would engage in venue-shopping, looking for a nation that had not yet legally banned reproductive cloning. An international convention against such cloning, if approved by the U. N., would instantly announce an international moral consensus against reproductive cloning efforts and additionally would have legal force in member nations that decided to approve and ratify the convention.

At the November 2001 session of the U.N.'s Legal Committee, the Vatican observer was the sole voice arguing that the convention should be expanded to ban research cloning—sometimes called “therapeutic cloning”—as well. Beginning in February 2002, the United States also announced its intention to link the questions of reproductive cloning and research cloning (here called Option 5). France and Germany argued that the issue on which an international consensus undoubtedly exists should be treated first, with a discussion of research cloning to follow as a second and distinct topic. Other nations, including especially the United Kingdom, already had legalized research cloning and thus were opposed in principle to any international convention directed against the practice.

Advocates of the narrow and the broader cloning bans debated the scope of the proposed convention in three separate sessions of the General Assembly. The issue finally came to a head in the 58th Session of the Assembly, held between September and December 2003. The U.S. position was represented at the Ad Hoc Committee of the U.N.'s Legal Committee by a joint U.S.-Costa Rican proposal, which recommended the preparation of “a draft text of an international convention against human cloning, bearing in mind that it will not prohibit the use of nuclear transfer to produce DNA molecules, organs, plants, tissues, cells other than human embryos or animals other than humans” (U.N. Document A/C.6/58/L.2, 26 September 2003). The French-German position was laid before the Ad Hoc Committee in the so-called “Belgian” proposal, which recommended the preparation of a “draft international convention against the reproductive cloning of human beings” (A/C.6/58/L.8, 2 October 2003). In late September 2003, more than 65 science academies that are members of the Interacademy Panel on International Issues submitted a statement to the Legal Committee's Ad Hoc Committee, urging members not to include research cloning in the international convention. The Ad Hoc Committee was unable to reach a resolution—a fact reflected in the 3 October report of the Ad Hoc Committee chair to the parent committee (A/C.6/58/L.9, 3 October 2003).

In October and November 2003, the Legal Committee attempted to reach a compromise solution. At a late October meeting, the two opposing sides again reached a stalemate. However, at a climactic 6 November meeting, a coalition of nations led by Iran and supported by most members of the Organization of Islamic Conference proposed a two-year deferral of further debate on the competing resolutions in the U.N. General Assembly (U.N. Document A/C.6/58/SR.23, 6 November 2003). The Iranian procedural motion prevailed by a vote of 80 to 79, with 15 abstentions. Nations voting for the deferral included Belgium, Brazil, China, the Czech Republic, Denmark, France, Germany, Greece, Hungary, India, Iran, Japan, Mexico, the Netherlands, the Republic of Korea, the Russian Federation, Singapore, South Africa, Sweden, Switzerland, and the United Kingdom—a list that includes all of the countries with the most liberal policies on HESC research, as well as multiple nations that preferred to restrict the focus of the convention to reproductive cloning. Industrialized nations voting against the deferral included Australia, Austria, Chile, Ireland, Israel, Italy, Norway, Poland, Portugal, Slovakia, Spain, the U.S., and Venezuela—a list that includes several countries that have adopted Option 1, banning human embryo research. Several developing nations, among them Fiji, Kenya, Lesotho, and Uganda, also voted against deferral. Canada abstained. (U.N. Document A/58/520, 11 November 2003).

Undeterred by what was widely perceived as a stunning defeat, the Costa Rican delegation sought to have the full General Assembly reconsider the Legal Committee's recommendation. In a draft resolution introduced on Friday, 5 December, Costa Rica asked the U.N. General Assembly to reconvene the Ad Hoc Committee on an International Convention against the Reproductive Cloning of Human Beings for one week during the 59th General Assembly in the fall of 2004. The new resolution also reasserted the link between research cloning and reproductive cloning. Clauses drawn from the earlier U.S.-Costa Rican resolution include the following:

Convinced that human cloning, for any purpose whatsoever, is unethical, morally repugnant and contrary to due respect for the human person, and that it cannot be justified or accepted . . .

• • •

[The General Assembly] [*s*]olemnly declares that, pending the adoption of an international convention against human cloning, States shall prohibit any research, experiment, development, or application in their territories

or areas under their jurisdiction or control of any technique aimed at human cloning. . . . (U.N. Document A/58/L.37, 5 December 2003)

Before the 9 December General Assembly discussion of the cloning issue, a behind-the-scenes compromise was reached. Costa Rica agreed not to bring its draft resolution to the floor of the Assembly, while the OIC-Belgian coalition agreed to a one-year deferral instead of the two originally specified in the vote of the Legal Committee. Thus, the topic of “an international convention on reproductive human cloning will be on the General Assembly’s agenda for the fall of 2004 (U.N. General Assembly, press release GA/10218, 9 December 2003). In a statement on the General Assembly floor immediately after this compromise was accepted by the plenary body, the U.K. representative forcefully rejected the view that reproductive cloning and research cloning should be linked.

The United Kingdom is profoundly disappointed by the actions of those who sought until recently to overturn the decision of the Sixth Committee.

During the deliberations of the sixth committee we made clear the views of the United Kingdom. The United Kingdom is totally opposed to reproductive cloning and we were one of the first countries in the world to introduce specific legislation to ban this possibility.

However in our view therapeutic cloning is a different matter. The UK believes that all types of stem cell research, including therapeutic cloning, should be encouraged. Indeed we believe that it would be indefensible to stop this research and deny millions of people—and their families—the chance of new treatments which could save their lives.

The international scientific community supports this view. More than 60 of the world’s leading scientific academies (including the United States National Academy of Sciences) published a joint statement in September 2003 calling on the United Nations to ban reproductive cloning—but to permit therapeutic cloning research.

Mr President, the United Kingdom respects the cultural, religious and social differences that may lead other countries to reach different conclusions on what type of research may be appropriate in their own national setting. We have no wish to impose our view on other countries or to interfere in decisions which have been legitimately taken by other national governments.

We believe that it would be totally unjustifiable to attempt to impose a ban on therapeutic cloning in those countries which have reached a national consensus in favour of this research; which have nationally agreed regulatory systems for embryo research; and which are working to deliver new treatments for serious and life threatening diseases.

I have already expressed our disappointment at the present situation. We believe that the United Nations should proceed through consensus. It is clear that there is no consensus in respect to therapeutic cloning research. But by ignoring this fact and pressing for action to ban all cloning, supporters of the Costa Rican resolution have effectively destroyed the possibility of action on the important area on which we are all agreed—a ban on reproductive cloning.

I wish to make clear that the United Kingdom would never be party to any convention which aimed to introduce a global ban on therapeutic cloning, neither will the UK participate in the drafting of such a convention nor apply it in its national law. Therapeutic cloning research will continue to be permitted in the UK.

Thank you Mr President. (Thomson 2003)

The compromise also did not fully satisfy the Egyptian representative, who “said he’d gone along with the consensus but had concerns about the plenary’s decision to not follow the Committee’s recommendation. The decision was procedurally questionable and could set a bad precedent” (U.N., Press Release, GA 10218, 9 December 2003).

We cannot know what the outcome of a vote on the original proposals would have been. An advisor to the Iranian U.N. delegation with whom I spoke noted that the United States delegation had lobbied vigorously for the Costa Rican resolution through Friday, 5 December, but became amenable to a compromise on Monday, 8 December. In his opinion, the Costa Rican resolution would have lost to the two-year deferral in a showdown vote of the plenary body.

The Vatican, the United States, and Costa Rica have been the most visible and consistent advocates for a convention outlawing all kinds of cloning. The Vatican-Costa-Rican-U.S. position presupposes that early human embryos are persons and, as such, bear human rights, including the right not be harmed. The Vatican, Costa Rica, and the United States also have argued (1) that research cloning would require a large group of oocyte providers and would therefore exploit women, (2) that the oocyte providers likely would be recruited from among the poorest and most marginalized peoples of the world, (3) that an international commercial market in oocytes and perhaps in cloned stem cells would develop, (4) that the diversion of resources from research on adult stem cells would reduce the chance that this noncontroversial type of research will succeed, and (5) that resources spent on high-technology fields like research cloning would be used more appropriately to confront “pressing global issues in developing countries.”

Against the U.S.-Costa-Rican-Vatican position several groups are arrayed. The French and German delegations represent nations that have rather conservative domestic policies on human embryo research but assert that they simply wish to have the nations of the world take a clear moral and legal stand against reproductive cloning. Other nations, including the United Kingdom, Belgium, India, China, and in the near future Singapore and perhaps Sweden, permit or support research cloning and therefore do not want to see the practice condemned. The scientific community, insofar as it is represented by the national academies of science, sees enormous medical promise in research cloning and seeks to defend scientific freedom against what it perceives as political interference. The Organization of the Islamic Conference (OIC) has emerged as a new and perhaps decisive political force in the U.N. cloning debate. A fatwa issued in January 2003 and circulated by the OIC may have helped to clarify the cloning issue for some OIC members (Farley 2003). In this fatwa, which was indebted to the comments of other leading Islamic scholars, Professor Ahmad Al-Tayyeb of Al-Azhar University in Cairo argued that the best analogy for using somatic cell nuclei and oocytes to create human embryonic stem cells is the respected practice of donating cells, tissues, or organs for transplantation. In his words, "Cloning parts of the human body so as to replace parts that ill and sick people have lost or as a therapeutic tool to treat some diseases, it would be considered as lawful" (Al-Tayyeb 2003). On this view, early embryos and five-day-old blastocysts created through nuclear transfer are not human subjects deserving protection, but are instead undifferentiated bearers of potentially beneficial cells from donors to recipients.

A final objection to the U.S.-Costa-Rican-Vatican position concerns the role of the United Nations itself. If a U.N.-sponsored international convention is neither supported nor ratified by most countries with advanced biotechnology programs, adoption of the convention by a narrow majority of nations would be virtually meaningless and could, in fact, undermine the authority of the U.N. Among the nations that have made it clear they will not ratify any convention that bans research cloning are Belgium, China, Denmark, France, Germany, India, Iran, Japan, the Netherlands, Singapore, the Republic of Korea, Sweden, and the United Kingdom.

In the various national positions on HESC research and in the ongoing U.N. debate on human cloning, there are indications that cultural and religious factors may play a role in the thinking of participants in the discussion. The next section of this article discusses the religious traditions that have been involved most visibly in this intercultural dialogue.

RELIGIOUS TRADITIONS AND HESC RESEARCH

Three interdisciplinary advisory bodies on HESC research convened in recent years have invited representatives of major religious traditions to comment on the ethics of such research: the U.S. National Bioethics Advisory Commission (NBAC) (1999), the European Group on Ethics of the European Commission (2000), and Singapore's Bioethics Advisory Committee (2001). In the papers and letters submitted by these representatives, a rather consistent picture of the various religious viewpoints emerges. Because human embryo research became an important scientific field only in the late 1960s, the traditions have had less than 40 years to wrestle with the questions raised by the research. The time interval since the first publication about the cloning of a mammal (1997) and about the creation of human embryonic stem cells (late 1998) is even more abbreviated. Commentators thus frequently seek to extrapolate from long-debated issues like contraception and abortion when they discuss novel questions like human embryo research, HESC research, and cloning.

Judaism

In the Jewish tradition, moral status is not ascribed to the human embryo at the time of fertilization. Instead, the virtually-unanimous view is that the human embryo is "like water" during the first 40 days of its development. In the words of Moshe Tendler, an Orthodox scholar,

The Judeo-biblical tradition does not grant moral status to an embryo before 40 days of gestation. Such an embryo has the same moral status as male and female gametes, and its destruction prior to implantation is of the same import as the "wasting of human seed." (Tendler 2000, H-3).

The Jewish religious tradition also places a strong emphasis on the saving of life (*pikuach nefesh*), and several commentators from this tradition have considered the ultimate goal of HESC research to be life-saving. Laurie Zoloth, a conservative Jewish scholar, described this constructive mission in her testimony before NBAC.

The task of healing in Judaism is not only permitted, it is mandated. This [viewpoint] is supported and directed not only in early biblical passages ("you shall not stand idly by the blood of your neighbor," and "you shall surely return what is lost to your neighbor"), but in numerous rabbinic texts as well. The general thrust of Jewish response to medical advances has been positive, even optimistic, linked to the notion that advanced scien-

tific inquiry is a part of *tikkun olam*, the mandate to be an active partner in the world's repair and perfection. (Zoloth 2000, J-15—J-16; endnote omitted)

The positions argued by Tandler and Zoloth are strongly supportive of Option 3, the derivation of embryonic stem cells from remaining human embryos. Neither scholar explicitly discusses the morality of Options 4 or 5, although Zoloth (J-19) asks whether nuclear transfer would constitute an “improper mixing of two kinds.”

Islam

Within Islam one cannot speak of unanimity on the question of embryonic moral status. Various scholars and religious leaders issue their formal opinions, or fatwas, but no single individual or group exercises supreme authority in matters of doctrine or practice (Eich 2003). At the same time, however, the overwhelming majority of Muslim legal commentators through the ages have accepted the morality of abortion through either the fortieth day or the fourth month of pregnancy. A classic commentary from the ninth century states the majority position on human embryonic development quite clearly.

Each one of you possesses his own formation within his mother's womb, first as a drop of matter for forty days, then as a blood clot for forty days, then as a blob for forty days, and then the angel is sent to breathe life into him (*Sahih al-Bukhari* [d. 870] and *Sahih al-Muslim* [d. 875], *The Book of Destiny [qadar]*. (Sachedina 2000, G-4).

This developmental view is quite compatible with the acceptance of HESC research involving five-day old blastocysts. In a statement before NBAC, Abdulaziz Sachedina summarized the various Islamic faith traditions as follows:

[O]n the basis of all the evidence examined for this testimony, it is possible to propose the following as acceptable to all schools of thought in Islam:

1. The Koran and the Tradition regard perceivable human life as possible at the *later* stages of the biological development of the embryo.

2. The fetus is accorded the status of a legal person only at the later stages of its development, when perceptible form and voluntary movement are demonstrated. Hence, in earlier stages, such as when it lodges itself in the uterus and begins its journey to personhood, the embryo cannot be considered as possessing moral status.

3. The silence of the Koran over a criterion for moral status (i.e., when ensoulment occurs) of the fetus allows the jurists to make a distinc-

tion between a biological and a moral person, placing the latter stage after, at least, the first trimester of pregnancy (Sachedina 2000, pG-4—G-5).

Sachedina's interpretation of Islam is that the tradition permits the use of five-day-old blastocysts to produce embryonic stem cells (Option 3). It is less clear whether Sachedina considers Options 4 and 5 also to be compatible with Islamic law and ethics.

In Singapore, Muslims constitute almost 15 percent of the population, thus slightly outnumbering Christians. During its deliberations on HESC research, the Singapore Bioethics Advisory Committee solicited the opinion of local Islamic scholars on HESC research. The Legal (*Fatwa*) Committee of the Majlis Ugama Islam Sinapura (Islamic Religious Council) responded as follows:

The Fatwa Committee rules that the opinion of the Bioethics Advisory Committee to use stem cells from embryos below 14 days for the purpose of research, which will benefit mankind, is allowed in Islam. This is with the condition that it is not misused for the purpose of human reproductive cloning, which would result in contamination of progeny and the loss of human dignity. (Singapore, Bioethics Advisory Committee (BAC) 2002, G-3-71)

The Fatwa Committee's statement clearly endorses Option 3 and, by implication, accepts research cloning (Option 5), as well.

Buddhism

Buddhists are the largest religious group in Singapore, constituting 42.5 percent of the population. Representatives of this tradition were contacted by the Singapore Bioethics Advisory Committee to solicit their views on HESC research. The Secretary General of the Singapore Buddhist Federation responded on behalf of his tradition, affirming the moral permissibility of the research while expressing reservations about cloning.

The basic precept of Buddhism is against harming and killing all beings. We are taught to have love and compassion for all beings.

Regarding the research on human stem cell[s], Buddhism will look at it seriously from the point of intention. If the intention of the research is to find [cures] specifically to human therapeutic[s]—[i]n other words, if the aim of the research is to help and benefit humankind, then we will deem the research as ethical. On the other hand, if the research is something just for the sake of doing or simply to make money out of it, then we will feel it is unethical.

As for human [cloning], although Buddhism did not state that beings are created by God and . . . different forms of birth are mentioned in the scriptures, . . . we are definitely against it. We feel that this will affect the society both morally and socially. (Singapore, BAC 2002, G-3-33)

Whether the Federation's objection to cloning extended to research cloning or focused exclusively on reproductive cloning was not entirely clear in the text of the response. The Federation clearly accepted Option 3 but stipulated that the research must be done with the proper intention.

In Buddhist thought worldwide, there is a clear diversity of opinion on HESC research. There is also no central authority to adjudicate ethical disagreements. One of the most vigorous critiques of HESC research was published in 2002 by Damien Keown, Reader in Buddhism at Goldsmiths College in London and co-editor of the *Journal of Buddhist Ethics*. According to Keown (2001),

Given the emphasis that Buddhism places on the central virtues of knowledge and compassion, the recent advances in scientific understanding and the prospect of the development of cures and treatments which alleviate human suffering are to be welcomed.

At the same time, however, the Buddhist religion places great importance on the principle of *ahimsa*, or non-harming, and therefore has grave reservations about any scientific technique or procedure that involves the destruction of life, whether human or animal. Such actions are prohibited by the First Precept of Buddhism, which prohibits causing death or injury to living creatures.

Keown thus argues that a consistent Buddhist ethic is most compatible with Option 1 (see also Keown 1995, pp. 118–22).

In contrast to Keown, Courtney Campbell (1997, D-25) interprets the principle of *ahimsa* to prohibit only the “infliction of violence or harm on *sentient* beings.” Thus, he concludes that the Buddhist tradition in principle could accept research on nonsentient preimplantation embryos under some circumstances (Option 3 or perhaps even Option 5).

Hinduism

Hindus constitute 4 percent of Singapore's population. In response to the Singapore Bioethics Advisory Committee's solicitation in November 2001, the Hindu Endowments Board of Singapore indicated its acceptance of stem cell research within certain time limits. Its position most closely paralleled Option 3. The Board did not specifically address the question of research cloning.

Energy in the form of life is manifest in the living cells including stem cells derived from early embryos (ES cells).

It is suggested that in Singapore the embryos created by in vitro fertilization, not more than 14 days old, can be used for research.

So also, the ES cells derived from 5 days old frozen embryos can be used to establish the cell lines.

According to our Faith (Hinduism) killing a foetus is a sinful act (BHROONA HATHYA). But whether the 14 day old foetus is endowed with all the qualities of life is not well regarded. Therefore, there is no non-acceptance to use these ES cells to protect human life and advance life by curing disease. (Singapore, BAC 2002, G-3-2)

The Board went on to indicate its non-acceptance of embryonic germ cell research because the remainder of the fetus would be killed (G-3-2)

In general, the Hindu ethical tradition has been quite protective of human embryos and fetuses from the time of conception forward. A vivid description of what occurs during sexual intercourse and the initiation of pregnancy appears in the first-century text entitled *Caraka Samhitā*.³

Conception occurs when intercourse takes place in due season between a man of unimpaired semen and a woman whose generative organ, (menstrual) blood and womb are unvitiated—when, in fact, in the event of intercourse thus described, the individual soul (*jīva*) descends into the union of semen and (menstrual) blood in the womb in keeping with the (*karmically* produced) psychic disposition (of the embryonic matter). (Lipner 1989, pp. 53–54, quoting from Sarirasthana, 3.3).

Abortion was justified only in the extreme circumstance that the continued development of the fetus threatened the life of the woman (Crawford 1995, p. 32). In this tragic circumstance, the quality of mind that was to be exhibited during the destruction of the fetus was *daya*, or compassion (Crawford 1995, p. 32).

The Hindu Endowment Board of Singapore explicitly noted that abortion is condemned by the Hindu ethical tradition. The Board seemed to suggest that the destruction of a preimplantation embryo is not equivalent to abortion if the goal of the research being performed is compassionate, that is, directed toward protecting the lives and promoting the health of (other) human beings. In somewhat parallel fashion, Swami Tyagananda, Hindu chaplain at the Massachusetts Institute of Technology (MIT), commented in an April 2002 lecture:

[T]he question that Hindus may ask is: can the destruction of the embryos in stem cell research be considered as an “extraordinary, unavoidable circumstance” and an act “done for greater good”? If it is, the Hindu tradition will accept the research as ethically justified. (Tyagananda 2002)

Taoism

Taoists constitute 8.5 percent of Singapore’s population. In its submission to the Singapore Bioethics Commission, the Taoist Mission (Singapore) seemed to reject as ethically unacceptable any research that results in the death of living embryos, thus advocating Option 1.

According to *Laojun jiejing*, “All living creatures that breathe, including those that fly and crawl, should not be killed. Even wriggling creatures also treasure life, even mosquitoes and other insects understand the avoidance of death.” (Singapore, BAC 2002, G-3-8)



Taoism treasures life deeply. As indicated by the Taoist saying, “the way of immortality is to value life, and the highest virtue is to save others.” Provided that it does not injure life, is not against morality and is not against the teachings of Taoism, Taoism supports research that increases longevity and brings benefit to mankind.

Taoism is not supportive of research that goes against the teachings of Taoism, that goes against nature, and that involves the killing of another life, e.g. using embryos for research. (Singapore, BAC 2002, G-3-9)

Christianity

Roman Catholicism

The history of Roman Catholic beliefs about the moral status of the developing human being *in utero* has been studied thoroughly by many scholars. In brief, from Saint Augustine through the nineteenth century (in official church teaching) and the early twentieth century (in canon law), the unformed early fetus was thought to lack a human soul because it lacked sentience. For this reason, contraceptive methods and the termination of a pregnancy before the fortieth day of fetal development were grouped together as sinful but nonhomicidal acts. Abortion after the fortieth day—that is, after the ensoulment of the fetus—was considered to be homicide (Noonan 1970).

Bioethics advisory groups in the U.S., Europe, and Singapore all requested submissions by spokespeople from the Roman Catholic religious tradition. In Europe and Singapore, the Catholic Church spoke with a single voice, reflecting the official teaching of the Vatican. In the U.S., at least one dissenting theological voice was heard.

The European Group on Ethics, in its 14 November 2003 opinion on the ethics of human stem cell research, reproduced the Declaration of the Pontifical Academy for Life dated 25 August 2000. This declaration can be viewed, at least in part, as a formal Roman Catholic response to the U.S. NBAC report of September 1999. Three distinct ethical questions were analyzed: the production of human embryonic stem cells after IVF; the production of human embryonic stem cells through nuclear transfer; and the use of already-existing human embryonic stem cell lines. The declaration emphatically adopts Option 1.

The *first ethical problem*, which is fundamental, can be formulated thus: *Is it morally licit to produce and/or use living human embryos for the preparation of ES cells?*

The answer is negative, for the following reasons:

1. On the basis of a complete biological analysis, the living human embryo is—from the moment of the union of the gametes—a *human subject* with a well defined identity, which from that point begins its own *coordinated, continuous and gradual development*, such that at no later stage can it be considered as a simple mass of cells.
2. From this it follows that as a “*human individual*” it has the *right* to its own life; and therefore every intervention which is not in favour of the embryo is an act which violates that right. Moral theology has always taught that in the case of “*jus certum tertii*” the system of probabilism does not apply.
3. Therefore, the ablation of the inner cell mass (ICM) of the blastocyst, which critically and irremediably damages the human embryo, curtailing its development, is a *gravely immoral* act and consequently is *gravely illicit*.
4. *No end believed to be good*, such as the use of stem cells for the preparation of other differentiated cells to be used in what look to be promising therapeutic procedures, *can justify an intervention of this kind*. A good end does not make right an action which in itself is wrong.
5. For Catholics, this position is explicitly confirmed by the Magisterium of the Church which, in the Encyclical *Evangelium Vitae*, with reference to the Instruction *Donum Vitae* of the Congregation for the Doctrine of the Faith, affirms: “The Church has always taught and continues to teach that the result of human procreation, from the first moment of its existence, must be guaranteed that unconditional respect which is morally due to the

human being in his or her totality and unity in body and spirit: “The human being is to be respected and treated as a person from the moment of conception; and therefore from that same moment his rights as a person must be recognized, among which in the first place is the inviolable right of every innocent human being to life” (No. 60).

The *second ethical problem* can be formulated thus: *Is it morally licit to engage in so-called “therapeutic cloning” by producing cloned human embryos and then destroying them in order to produce ES cells?*

The answer is negative, for the following reason: Every type of therapeutic cloning, which implies producing human embryos and then destroying them in order to obtain stem cells, is illicit; for there is present the ethical problem examined above, which can only be answered in the negative.

The *third ethical problem* can be formulated thus: *Is it morally licit to use ES cells, and the differentiated cells obtained from them, which are supplied by other researchers or are commercially obtainable?*

The answer is negative, since: prescindendo from the participation—formal or otherwise—in the morally illicit intention of the principal agent, the case in question entails a proximate material cooperation in the production and manipulation of human embryos on the part of those producing or supplying them. (Pontifical Academy for Life 2000, p. 181, endnote references omitted; emphasis in original)

In their testimony before NBAC, three representatives of the Catholic tradition reached differing conclusions. Edmund Pellegrino, a physician, reiterated the official teaching that “human life is a continuum from the one-cell stage until death” (Pellegrino 2000, F-3). However, a Catholic moral theologian, Margaret Farley, and a Catholic moral philosopher, Kevin Wildes, S.J., accented the pluralism of opinion about human embryonic status within the Catholic tradition. Professor Farley expressly dissented from current official Church teaching and argued that the moral case for HESC research is quite powerful, both within the Catholic tradition and in the public forum.

[A] case *for* human embryo stem cell research can also be made on the basis of positions developed within the Catholic tradition. A growing number of Catholic moral theologians, for example, do not consider the human embryo in its earliest stages (prior to the development of the primitive streak or to implantation) to constitute an individualized human entity with the settled inherent potential to become a human person. The moral status of the embryo is, therefore (in this view), not that of a person, and its use for certain kinds of research can be justified. (Because it is, however, a form of human life, it is due some respect—for example, it should not be bought or

sold.) Those who would make this case argue for a return to the centuries-old Catholic position that a certain amount of development is necessary in order for a conceptus to warrant personal status. Embryological studies now show that fertilization (“conception”) is itself a process (not a “moment”), and such studies provide support for the opinion that in its earliest stages (including the blastocyst stage, when stem cells would be extracted for purposes of research) the embryo is not sufficiently individualized to bear the moral weight of personhood. Moreover, some of the concerns regarding the use of aborted fetuses as a source for stem cells can be alleviated if safeguards (such as ruling out “direct” donation for this purpose) are put in place—not unlike the restrictions articulated for the general use of fetal tissue for therapeutic transplantation. And finally, concerns about cloning may be at least partially addressed by insisting on an absolute barrier between cloning for research and therapeutic purposes on the one hand and cloning for reproductive purposes on the other (the latter, of course, raising many more serious ethical questions than the former). (Farley 2000, D-4, endnotes omitted)

Professor Farley accepts Option 3 and seems willing to consider accepting Option 5, as well.

Eastern Orthodoxy

The Eastern Orthodox tradition was represented only in testimony before the U.S. NBAC. Demetrios Demopoulos expressed what seems to be a nearly-universal consensus within the Orthodox tradition when he argued against the destruction of human embryos for research purposes (Option 1).

Humans are created in the image and likeness of God and are unique in creation because they are psychosomatic, beings of both body and soul—physical and spiritual. We do not understand this mystery, which is analogous to that of the Theanthropic Christ, who at the same time is both God and a human being. We do know, however, that God intends for us to love Him and grow in relationship to Him and to others until we reach our goal of theosis, or deification, participation in the Divine Life through His grace. We grow in the image of God until we reach the likeness of God. Because we understand the human person as one who is in the image and likeness of God, and because of sin we must strive to attain that likeness, we can say that an authentic human person is one who is deified. Those of us who are still struggling toward theosis are human beings, but potential human persons.

We believe that this process toward authentic human personhood begins with the zygote. Whether created in situ or in vitro, a zygote is committed to a developmental course that will, with God’s grace, ultimately lead to a human person. The embryo and the adult are both potential human per-

sons, although in different stages of development. As a result, Orthodox Christians affirm the sanctity of human life at all stages of development. Unborn human life is entitled to the same protection and the same opportunity to grow in the image and likeness of God as are those already born. (Demopulos 2000, B-3, endnote omitted)

On the use of existing stem cell lines, Father Demopulos (2000, B-3) noted that “Wishing that something had not been done will not undo it. Established embryonic stem cell lines exist, and their use has great potential benefits for humanity” He argued that the existing lines should be used “only therapeutically, to restore health and to prevent premature death” (Demopulos 2000, B-4). Thus, his position closely approximated Option 2.

Protestant Traditions

The bioethics commissions in Europe, Singapore, and the United States all received testimony from representative of various Protestant traditions. As one might expect, Protestant commentators on the ethics of HESC research did not speak with one voice. In his testimony before the U.S. NBAC, moral theologian Gilbert Meilaender (2000, E-1–E-6) articulated a position that is virtually indistinguishable from that of the Vatican (espousing Option 1), although he did not rely on official statements of the Catholic Church. In contrast, Ronald Cole-Turner (2000, A-1–A-4) agreed with official statements of the United Church of Christ that support human embryo research through the fourteenth day of development—but only in the context of public discussion, public accountability, and a concern for social justice (Option 3, with conditions).

In October 2000, an ecumenical group of Protestant and Orthodox (but not Roman Catholic) thinkers submitted a position paper to the European Group on Ethics. The paper was entitled “Therapeutic Uses of Cloning and Embryonic Stem Cells” (Church and Society Commission 2000, pp. 190–98). After laying out three positions on HESC research, including the “intermediate position” of the Church of Scotland, the ecumenical statement ultimately rejects the use of human embryos as means to ends, even the lofty end of promoting human health (Church and Society Commission 2000, p. 196). The creation of embryos through nuclear transfer is quite clearly condemned, and the ecumenical group urges that “a priority should be put on nuclear transfer research which aims at avoiding the use of embryos, by direct programming from one adult body tis-

sue to another” (Church and Society Commission 2000, p. 196). This ecumenical statement comes close to adopting Option 1.

In letters to the Singapore Bioethics Advisory Committee, two Protestant groups also expressed ethical objections to the destruction of human embryos in HESC research. The National Council of Churches of Singapore—representing Lutherans, Methodists, Anglicans and Presbyterians—argued that insofar as “experimentation with embryo[s] . . . necessitates their destruction, . . . it is our considered opinion that the ethical concerns far outweigh the therapeutic potentials” (Singapore, BAC 2002, G-3-66). The Singapore Council of Christian Churches, comprised of conservative evangelical Protestants, also opposed the “willful destruction of human embryos for medical research” (Singapore, BAC 2002, G-3-69). Thus, both groups advocated Option 1.

POSSIBLE CORRELATIONS BETWEEN RELIGIOUS TRADITIONS AND NATIONAL OR CULTURAL VIEWS

Any attempt to discover tidy correlations between the range of national and regional perspectives outlined is fraught with difficulty and may, in fact, be doomed to fail. Any commentator on such correlations should take into account several complicating factors. First, the relationships between governments and the religious groups within them assume many different configurations, varying from state establishment of a single religious faith—whether Jewish, Christian, or Muslim—to direct tax support for religious groups (as in Germany) to special tax rules or exemptions (as in the U.S.) to arrangements in some secular democratic states according to which religious groups are treated on the same basis as all other nonprofit organizations. It may also be the case that discussions of “religion” and “the state” betray a peculiarly European approach to a set of issues, one that would not easily fit some cultures or some conceptions of society.

Second, as I have noted and will note again in this section, most of the religious traditions themselves are pluralistic. Few traditions have the centralized authority structure of Roman Catholicism or Eastern Orthodoxy; that is, there is no Jewish or Muslim or Buddhist or Hindu pope or authoritative group of bishops. Instead, one has authoritative texts, usually arranged into a hierarchy of importance—texts that then are interpreted by a variety of religious leaders and academics. The result can be a bewildering array of viewpoints. Even in Catholicism, there are points of disagreement between official church teaching and the views of dissenting theologians.

Third, it may be the case that bioethics, or ethics more generally, is a peculiarly European and Middle Eastern field, with few parallels in classic eastern religions like Hinduism, Buddhism, or Taoism. When groups with the words “ethics” or “bioethics” in their titles solicit the opinions of religious traditions on specific topics like human embryo research or HESC research or cloning, representatives of the various religious traditions dutifully attempt to relate earlier teachings on analogous questions to the new issues raised by twentieth-century biomedical research. However, the correspondence with earlier questions is never one-to-one. In fact, the selection of a particular analogy as the most appropriate one can have a decisive influence on a commentator’s moral judgments.⁴

Fourth, the desire of scientists to pursue their research with generous public funding and with the minimum amount of government regulation has been a recurring factor in the HESC debate and is reflected in many statements by academies of science and medical organizations. I would not want to stretch the concept of religion to cover the prevailing view of most biomedical scientists. However, it is fair to say that their philosophy of life sets a high value on new knowledge and convincing evidence and sees biotechnology as an important means toward achieving the laudable goal of preventing and curing disease. In some countries—e.g., the U.K., Spain, and the U.S.—patient advocacy groups for victims of Alzheimer’s disease or juvenile onset diabetes have echoed the views of scientists.

A fifth and final caveat is that we should not forget the economic and competitive dimensions of HESC research and technology. Some nations—e.g., the U.K., Sweden, Israel, India, Singapore, China, Japan, and Australia—are investing heavily in this arena of research in the hope of long-term payoff. That payoff may take the form of intellectual property, new and more desirable stem cell lines, or novel therapeutic products. Scientists in nations (or even states) with restrictive policies sometimes have faced the decision whether to move to less restrictive settings or, alternatively, whether to conduct some of their research abroad, for example, in a relatively liberal nation like Singapore. National or local organizations that represent the biotechnology industry regularly remind public officials that their policies will, for good or ill, have a commercial impact.

With these cautions and caveats in mind, I will (perhaps audaciously) attempt to discover at least some correlations between religious traditions and prevalent national or cultural views. The relationship between religious traditions and national policies has been most clear-cut and pronounced in the nations in which persons who identify themselves as Chris-

tians constitute either a majority or a substantial minority of the population. The Vatican, national Catholic organizations, representatives of conservative Protestant denominations and the Eastern Orthodox tradition, and some Christian laypeople have been at the forefront of the HESC debate, both nationally and internationally. The political organization and influence of conservative Christians have been most visible in the U.N. debate about cloning and the EU controversies about what types of HESC research, if any, should be financially supported by the 6th Research Program. Conservative Christian individuals and groups also have argued for Option 1, or at most Option 2, and against Options 3, 4, and 5 during the intra-national debates in at least the following countries: Australia, Austria, Belgium, Canada, France, Germany, Ireland, Italy, the Netherlands, Norway, Singapore, South Korea, Spain, Taiwan, the U.K., and the U.S. At the state level in the U.S., conservative Catholics and Protestants also have been quite actively involved in attempts to prohibit, or to restrict the scope of, HESC research. In addition, conservative Protestants, the Vatican and most Catholic commentators, and an Eastern Orthodox spokesman have opposed HESC research in their submissions to bioethics committees in the U.S., Europe, and Singapore.

The cultural influence of Judaism also seems quite apparent, at least to this observer. The one nation with a Jewish majority, Israel, has been quite consistent in supporting HESC research and in principle has adopted Option 5. Israel's policy is totally consistent with the virtually unanimous Jewish religious perspective on the moral status of the human embryo. Jewish representatives who have testified before bioethics advisory committees also have spoken with one voice in favor of HESC research.

It is more difficult to generalize about the nations in which Islamic clergy and/or law are significant factors in public policymaking. The most clear-cut case is Iran, in which a government led by Shiite Muslim clergymen publicly congratulated researchers who derived stem cells from human embryos in 2003. In testimony before bioethics committees in the U.S., Europe, and Singapore, Muslim witnesses have testified in favor of the research and against restrictions on it. In Singapore, the Islamic Religious Council argued only against reproductive cloning. I also have noted the decisive role played by Iran and the Organization of Islamic Conference in blocking the U.S.-Vatican-Costa Rican attempt to have the U.N. adopt an international convention against research cloning. In that debate a fatwa written by a prominent Shiite scholar seems to have influenced the thinking of some OIC representatives to the U.N. However, as

Thomas Eich from Ruhr-University Bochum notes, Islamic scholars are far from unanimous in their opinions about the proper treatment of remaining embryos, the creation of embryos for research purposes, research cloning, and reproductive cloning. Whether the analogy of abortion or of cell donation will be chosen as central may be important for the outcome of that debate (Eich 2003). One should remember also that in 2003 some Islamic countries may have opposed a policy espoused by the U.S. for reasons that have more to do with current U.S. policy in the Middle East and the Persian Gulf than with the specific topic of research cloning.

For me, as a westerner raised in a Protestant (Mennonite) family, it is no simple matter to generalize about Asian religious and cultural traditions and their possible impact on regional or national policymaking. Singapore provides the one current case study. In that nation, the representatives of Buddhism and Hinduism supported HESC research, while the spokesmen for Taoism opposed it. A thoroughgoing analysis would need to examine the extent to which Asian religious and cultural traditions influence public policies in each Asian nation that has debated this issue—China, India, Japan, Taiwan,⁵ and South Korea. In the future, Thailand, in which Buddhism is the official state religion, also may consider a national policy on HESC research. It is perhaps worth noting that none of these Asian nations explicitly has adopted Option 1 or Option 2. In none of the Asian nations that I have studied is research using remaining embryos (Option 3) legally prohibited. One East Asian nation, China, has accepted, at least locally, Option 6—an option that has not been endorsed even in the U.K., traditionally the most liberal western nation on these issues.

CONCLUSION: PROSPECTS FOR THE FUTURE

In the years to come, the local, national, and international debate about HESC research is likely to continue. States and nations in which Option 3 is official policy will continue to host, and in some cases to foster, HESC research that uses remaining embryos. The few countries and states that accept Option 4 and/or Option 5—the U.K., Belgium, China, India, Israel, South Korea, two or more states in the U.S., and (probably) Singapore and Sweden—will continue with these more ethically-controversial modes of research. If a major scientific or therapeutic breakthrough occurs with, for example, human research cloning, one can predict that some of the current ethical opposition to this mode of research will diminish. On the other hand, if human somatic cells in fact can be re-programmed and rendered pluripotent (like the minimally differentiated cells of the

blastocyst's inner cell mass), then substantial numbers of researchers may gravitate—perhaps with a sigh of relief—toward research methods that do not require the destruction of early human embryos.

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NOTES

1. The 11 states, beginning with the northeast, are Maine, Massachusetts, Rhode Island, Pennsylvania, Florida, Louisiana, Michigan, Minnesota, Iowa, North Dakota, and South Dakota. Massachusetts has a “safe harbor” provision that allows human embryo research if it is approved by a local institutional review board and is subsequently submitted to, and not disallowed by, the local district attorney. Iowa prohibits “destructive research” on human embryos.
2. This section of the article draws upon and expands a brief article I wrote entitled “The United Nations and Human Cloning: A Debate on Hold,” published in the January–February 2004 issue of the *Hastings Center Report*.
3. For a discussion of the dating and importance of the *Caraka Samhitā*, see Crawford (2003, pp. 36–38).
4. For the caveats entered in these four paragraphs, I am especially indebted to comments and suggestions by Alexandre Mauron at the University of Geneva, Thomas Eich at the Ruhr-University Bochum, Erik Parens at the Hastings Center, and John Langan at the Kennedy Institute of Ethics.
5. Professor In Chin-Chen has written me to say that religious traditions have not played a major role in the Taiwanese HESC debate (personal communication, 19 December 2003).

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