The Ethics of HEK 293

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The topic of embryonic stem cells is very much in the forefront of public interest. The moral stance on obtaining stem cells from embryos is clear: The Church has always taught that all human life from the very beginning must be respected and protected. If human embryos are killed to obtain a certain type of cell, such action is morally wrong, no matter what good might be derived from the action. The document *Donum vitae,* issued by the Church in 1987, states that "from the moment of conception, the life of every human being is to be respected in an absolute way … God alone is the Lord of life from its beginning to its end: No one can under any circumstance claim for himself the right directly to destroy an innocent human being."[1] "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."[2]

What is perhaps not so well known is the fact that cell lines developed from embryonic cells (cells obtained from embryos) have already been in use for many years in various areas of laboratory research and pharmaceutical production.

The human embryonic kidney (HEK) 293 cell line is widely used in laboratory research. HEK 293 was derived from the kidney cells of a human embryo, as its name denotes. A student or fellow involved in life sciences research would almost

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[1] Congregation for the Doctrine of the Faith, *Donum vitae* (February 2, 1987), Introduction, 5.

[2] Ibid., I, 1.

inevitably encounter this cell line in the course of his work. A common use for it is in the field of gene therapy, where it is used to propagate adenovirus. Adenovirus is a common vehicle used to deliver experimental genes. There are also other derivatives of HEK 293 used in this field.

How Was It Obtained?

The question that needs to be asked is how the original cells were obtained: from an induced abortion, from an embryo naturally miscarried, or from an artificial reproductive technique? Were they obtained in a morally licit manner?

My investigation began with asking a worldwide distributor of cell lines (who supplies HEK 293 in the United States). The company replied that they did not know and recommended that the depositor of the cell line be consulted. In concurrent communication with the depositor, Dr. F. L. Graham of McMaster University, Ontario, I was also unable to determine the origin of HEK 293, except that it was unlikely to be from in vitro fertilization, since the cell line was developed around 1973[3] (e-mail message, December 18, 2002).

A publicly available document records the proceedings of a meeting in May 2001 of the U.S. Food and Drug Administration (FDA) Vaccines and Related Biological Products Advisory Committee. In this document, which deals with both the HEK 293 and the PER.C6 fetal cell lines, Dr. Alex van der Eb, who was involved in the development of HEK 293, is quoted:

> So the kidney material, the fetal kidney material was as follows: the kidney of the fetus was, with an unknown family history, obtained in 1972 probably. The precise date is not known anymore. The fetus, as far as I can remember was completely normal. Nothing was wrong. The reasons for the abortion were unknown to me. I probably knew it at that time, but it got lost, all this information.[4]

Could there have been any chance that the "abortion" referred to in the FDA document might mean a naturally or spontaneously aborted (i.e., miscarried) fetus? The context certainly sounds as if it referred to a routine-induced abortion, with no qualifications mentioned. In examining the issue further, it appears that in all probability the cells were obtained from the embryo of a willfully induced abortion. Not only is it easier administratively to receive cells from induced abortions of normal pregnancies than from spontaneous miscarriages, it may also be scientifically more advantageous to use tissue from induced abortions, which are "healthier," since the majority of fetuses are usually genetically normal and aborted for social reasons. In the FDA proceedings, Dr. van der Eb admits that the fetus was "completely normal." He later gives testimony to the development of PER.C6 (human embryonic retinal cells), in which the evidence that it was obtained from a willfully induced abortion is undeni-

[3] See the product description of the HEK 293 cell line (ATCC number CRL-1573) at www.atcc.org.

[4] A. van der Eb, testimony before the Vaccines and Related Biological Products Advisory Committee, May 16, 2001, FDA Center for Biologics Evalution and Research meeting transcript, 81, http://www.fda.gov/ohrms/dockets/ac/01/transcripts/3750t1_01.pdf.

able.[5] Again, it was a "healthy fetus." PER.C6 is used for similar purposes as HEK 293 in the field of gene therapy.

For the sake of the consciences of the people who work with HEK 293, I wrote to Dr. van der Eb at Leiden University, who confirmed that the records pertaining to the origins of HEK 293 were indeed lost, consistent with his statement to the FDA (e-mail message, October 27, 2003).

Since Dr. van der Eb *does* admit to working with tissue from induced abortions, even if there may have been one or more occasions of working with tissue from spontaneous abortions, it seems more likely that the tissue would be from an induced abortion. The convenience of getting tissue from routine, elective abortions compared to waiting for an unforeseen miscarriage supports this likelihood.

Furthermore, there seems to be an ongoing industry in this area, where obtaining fetal tissue from routine abortions becomes a standard procedure.[6] The use of

[5] Ibid. "So I isolated retina from a fetus, from a healthy fetus as far as could be seen, of eighteen weeks old. There was nothing special with the family history or the pregnancy was completely normal up to the eighteen weeks, and it turned out to be a socially indicated abortus—abortus provocatus, and that was simply because the woman wanted to get rid of the fetus" (91). "The father was not known, not to the hospital anymore, what was written down [was an] unknown father, and that was, in fact, the reason why the abortion was requested" (99). "There was permission, et cetera, and that was, however, was in 1985, ten years before this. This shows that the cells were isolated in October 1985, Leiden University in my lab" (91). At that time already 1985, I should say, the cells were frozen, stored in liquid nitrogen, and in 1995 one of these [vials] was thawed for the generation of the PER.C6 cells" (92).

[6] The following article extracts were obtained from the Children of God for Life Web site, at www.cogforlife.org: "Aborted New Zealand foetuses have become a sought-after product in a controversial international biotechnology market. *A Weekend Herald* investigation has revealed that Wellington's district health board stood to make money out of providing tissue from aborted foetuses to a Dutch company, Crucell. Capital and Coast Health Board pulled out of the deal last week following *Weekend Herald* inquiries into its application to the Wellington Regional Ethics Committee to take the tissue for the production of vaccines against HIV, ebola and other viral diseases. This week it emerged Crucell was interested in New Zealand because it had been identified as one of only four countries that can provide a source of foetal tissue clean of mad cow disease contamination…. In what would have been the first known case of New Zealand foetuses being used for commercial purposes, Capital and Coast Health would have profited by providing the tissue to Crucell, listed on New York's Nasdaq technology stock index," Eugene Bingham, "Government Asked to Sanction Foetus Sale," *New Zealand Herald* (May 24, 2003), http://www.nzherald.co.nz/category/story.cfm?c_id=204&objectid=3503775; "A Sydney company is involved in a secret plan to collect tissue from aborted babies and export it for medical experiments. The sensitive proposal, to harvest some of the ninety thousand foetuses aborted in Australia each year has been condemned by pro-life groups for fostering an international trade in human body parts. The *Daily Telegraph* has established that a Dutch bio-tech company, Crucell, working through a Sydney contract research organisation, Parexel International, has applied to the ethics committee of Queen Elizabeth Hospital in Adelaide for access to foetal material. It is believed to be the first proposed commercial collection of foetuses in

aborted fetuses in the development of cell lines had begun as early as the sixties, looking at the well-known WI-38 and MRC-5 lines. The WI-38 cell line was developed in July 1962 from lung tissue taken from a therapeutically aborted fetus of about three months' gestational age, while the MRC-5 cell line was developed in September 1966 from lung tissue taken from a fourteen-week-old fetus aborted for psychiatric reasons from a twenty-seven-year-old physically healthy woman.[7] The likelihood that the source of HEK 293 was a direct abortion must be considered in this context. In short, the possibility that the HEK 293 kidney cells come from a directly procured and deliberately willed abortion is extremely high.

The Need for Moral Certainty

Even if there was a fifty-fifty chance that the tissue for HEK 293 was taken from a spontaneous miscarriage, it would still present us with the duty of making a moral decision in a matter of grave implications. I do not think we can lightly apply the principle *in dubio, pro libertate* here. One should, rather, apply the well known analogy of a hunter having to be sure of his game before firing a shot. There must be positive identification of the material for research as licit, analogous to the need for a hunter to positively identify his game; it is inexplicable and ruthlessly irresponsible for a hunter to assert his right to shoot as long as the target is not proven to be a person; he must be certain that it is an animal or a thing.

Can we assume the best-case scenario if the origin of HEK 293 is not ultimately known? Could we take full advantage of an apparent administrative lapse, and proceed on the most convenient presumption? Is it possible to capitalize on the

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Australia, but those behind the project were hoping to carry it out without the public knowing. The tissue would be sent to Crucell's laboratories in the Netherlands and used to grow cell lines for research into vaccines for infectious diseases such as HIV and ebola. The abortion doctors who collect the tissue stand to make money out of the project—they would be paid an "hourly rate" for their time." Tony Wall, "Foetal Tissue for Overseas Sale," *Herald Sun,* June 10, 2003, www.heraldsun.news.com.au/common/story-page/0,5478,6570050%255E421,00.html; "The cell line developed at Coriell, identified as IMR-90, was the first of several lines planned in support of NIA research programs and general cell biology research. IMR-90 was developed and characterized in such a way as to parallel WI-38 as closely as possible to minimize the variables in replacing WI-38 within ongoing laboratory programs... The IMR-90 cell line, like WI-38, was derived from the lung tissue of a human female embryo following therapeutic abortion... Since the goal of establishing this cell line was a replacement for WI-38 in vaccine production, virus yields (plaque-forming units) were compared for IMR-90, WI-38 and MRC-5 for a number of different viruses including varicella zoster, herpes simplex, vesicular stomatitits virus and cytomegalovirus. In all cases, yields from IMR-90 were comparable to those from the other cell lines, confirming its utility in this role," Christine Beiswanger, "A Brief History of IMR-90," *Cell Collections* 2003/2004: 5–6, http://ccr.coriell.org/ccr/newsletter/CCRNews.pdf_4.pdf.

[7] See Coriell Cell Repositories, "Cell Line Characteristics WI-38—Normal Human Fetal Lung Fibroblast," repository no. AG06814, http://ccr.coriell.org/nia/nia_cgi/display.cgi?AG06814; and "Cell Line Characteristics MRC-5—Normal Human Fetal Lung Fibroblast," repository no. AG05965, http://ccr.coriell.org/nia/nia_cgi/display.cgi?AG05965.

inability of the suppliers of HEK 293 to provide the end user with full information about the origins of the cell line? We can imagine a biotechnological industry flooded with a host of HEK 293 equivalents with unknown origins and lost records—could we use all of them in good faith?

Those involved in the commercial distribution of cell lines have an ethical obligation to be clear on the sources of the cell lines. Without such clarity the end user is not provided with the full information necessary to make a major ethical decision. It is already known that the cells are embryonic in origin, so there is a high probability that they are from an induced abortion. There are not too many possibilities of which only one is unethical. Embryonic cell lines are being marketed, and the situation is not to be taken lightly.

To summarize, we do *not* have moral certainty about the source of HEK 293. There is no information assuring the end user of the moral licitness of its source. The obligation is on those who developed and distributed HEK 293 to demonstrate without a doubt that the cells were obtained in a morally licit manner, and not for the end user to prove the opposite. I argue that we *must* assume HEK 293 was developed from a willfully aborted embryo. The Pontifical Academy for Life's recent statement on vaccines is consistent with this position.[8]

A Review of Cooperation in Evil

Now we must examine the ethical complexities of a cell line developed from an aborted fetus. Other authors have written about its various facets, but I will attempt to detail the arguments of morality based on, first of all, the *agent involved*, and then apply the principles of both *cooperation in evil* and *appropriation of evil* to that particular agent. I feel that this matrix of arguments is necessary to grasp more comprehensively the issues at hand, which have repercussions in various sectors of society.

The agents involved (who face ethical issues) might include everyone from the person who was instrumental in obtaining the aborted fetal tissue and developing the cell line, to parents who must decide whether to give their child a vaccine which has been produced using the cell line. To simplify this discussion, I will confine the agents to three: the persons who obtain tissue and develop the cell line, those who are involved in the commercialization and distribution of the cell line, and the researchers who buy it or use it in the laboratory. The issue of vaccines produced from such cell lines has recently been commented on by the Vatican, and I intend to make my arguments consistent with that statement.[9]

In cooperation in evil, the *cooperator* contributes in some way to the wrongful action of the principal agent. In its traditional analytical dissection, one first considers if the cooperation is *formal* or *material*:

[8] Pontifical Academy for Life, "Moral Reflections on Vaccines Prepared from Cells Derived from Aborted Human Fetuses" (June 5, 2005), http://www.academiavita.org/template.jsp?sez=Documenti&pag=testo/vacc/vacc&lang=English; reprinted in this issue of the *Quarterly* on pp. 541–549.

[9] Ibid.

> *Formal cooperation* is carried out when the moral agent cooperates with the immoral action of another person, sharing in the latter's evil intention. On the other hand, when a moral agent cooperates with the immoral action of another person, without sharing his/her evil intention, it is a case of *material cooperation*.[10]

In formal cooperation the cooperator "intends, either as an end in itself or as a means to some other end, the wrongdoing designed by the principal agent …[It is] intentional furtherance of the illicit activity of another."[11] In material cooperation there is the provision of some type of assistance which facilitates the performance of an immoral action, but there is no sharing in the intent of the principal agent.

Material cooperation is then dichotomized into *mediate* and *immediate* forms. In *immediate* material cooperation, "the cooperator's action, described from an external perspective, completely overlaps with the action of the principal agent. … When viewed from the external perspective of an onlooker, there is generally nothing that distinguishes an act of immediate material cooperation from an act of formal cooperation."[12] *Mediate* cooperation occurs "if there is some distance between the two actions":[13]

> Material cooperation can be further divided into categories of *immediate* (direct) and *mediate* (indirect), depending on whether the cooperation is in the execution of the sinful action *per se,* or whether the agent acts by fulfilling the conditions—either by providing instruments or products—which make it possible to commit the immoral act. Furthermore, forms *of proximate cooperation* and *remote cooperation* can be distinguished, in relation to the "distance" (be it in terms of *temporal* space or *material* connection) between the act of cooperation and the sinful act committed by someone else. *Immediate material cooperation* is always *proximate,* while *mediate material cooperation* can be *either proximate* or *remote*.[14]

The Pontifical Academy for Life reminds us that formal cooperation is never permissible. Likewise, immediate material cooperation is illicit when serious issues concerning sanctity of life are involved:

> *Formal cooperation* is always morally illicit because it represents a form of direct and intentional participation in the sinful action of another person. *Material cooperation* can sometimes be illicit (depending on the conditions of the "double effect" or "indirect voluntary" action), but when *immediate material cooperation* concerns grave attacks on human life, it is always to be considered illicit, given the precious nature of the value in question.[15]

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[10] Ibid., 545 (original emphasis).

[11] M. Cathleen Kaveny, "Appropriation of Evil: Cooperation's Mirror Image," *Theological Studies* 61 (June 2000): 284.

[12] Ibid., 285, footnote 9 (emphasis added).

[13] Ibid.

[14] Pontifical Academy for Life, "Moral Reflections," 545 (original emphasis).

[15] Ibid. (original emphasis).

The justification of an act of mediate material cooperation involves deciding how *proximate* or *remote* the cooperator's action is to the principal agent's action. Furthermore, if the cooperator's action is essential for the principal agent to succeed in carrying out the evil action, it is *necessary* cooperation; if the principal agent will succeed with or without the cooperator's help, the cooperation is *contingent or free.* It is more difficult to justify necessary cooperation than it is to justify contingent cooperation.[16] Other points to consider in the equation are the *gravity of loss* suffered by the cooperator if he does not cooperate, the *magnitude of evil* planned by principal agent, and the risk of *scandal* resulting from the cooperator's action.[17]

Finally, we are also reminded of the culpability of omission (*passivity*), especially when it comes to grave matters concerning the culture of life:

> A further distinction made in classical morality is that between *active* (or positive) cooperation in evil and *passive* (or negative) cooperation in evil, the former referring to the performance of an act of cooperation in a sinful action that is carried out by another person, while the latter refers to the omission of an act of denunciation or impediment of a sinful action carried out by another person, insomuch as there was a moral duty to do that which was omitted. Passive cooperation can also be formal or material, immediate or mediate, proximate or remote. Obviously, every type of formal passive cooperation is to be considered illicit, but even passive material cooperation should generally be avoided, although it is admitted (by many authors) that there is not a rigorous obligation to avoid it in a case in which it would be greatly difficult to do so.[18]

Appropriation of Evil

At this juncture I would like to discuss *appropriation of evil*, which is not conceptually new, but the terminology of which may help provide additional accuracy in the moral analysis of the problem of cell lines like HEK 293. M. Cathleen Kaveny develops this new analytical category as the *mirror image of cooperation in evil*, which makes good sense in this modern era inundated with biological products of dubious or unethical origins:

> The category of cooperation covers cases in which agents worry about whether they may morally perform an action that in some way *facilitates* someone else's morally objectionable activity; it does not cover the "mirror image" situations in which agents wonder whether they can *take advantage of* the fruits or by-products of someone else's wrongful acts in order to facilitate their own morally worthwhile activity. As noted above, I propose referring to this latter situation as the problem of "appropriation of evil."[19]
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> The basic structure of the actions involved in cooperation and appropriation problems is the same. In both types of cases, an auxiliary agent performs an action that somehow facilitates or supports the principal agent's efforts in per-

[16] Kaveny, "Appropriation of Evil," 285, footnote 11.

[17] Ibid., 285.

[18] Pontifical Academy for Life, "Moral Reflections," 546 (original emphasis).

[19] Kaveny, "Appropriation of Evil," 286 (original emphasis).

> forming his or her own action. What is different in each case is the respective identities of the agent facing a moral decision about whether or not to go forward with a particular action, and the agent who has already decided to perform a morally objectionable act. In short, in cooperation cases the *auxiliary agent* is the morally conscientious decision-maker who must decide what to do in light of his or her prospective action's likely *contribution to* an evil act performed by the principal agent. In appropriation cases, the roles are reversed. Here, it is the *principal agent* who is the morally conscientious decisionmaker, who must decide whether to go ahead with an action that *makes use of* the fruits or by-products of a morally objectionable act performed by the auxiliary agent.[20]
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> In cooperation cases, the evil to be done is prospective; the cooperator's action causally contributes to the execution of the illicit action by the principal agent. From a perspective that focuses on the external dimension of human acts, cooperation problems are obvious; we can see how the cooperator's action fuels the evil act of another agent. But such a perspective renders the moral dangers of appropriation virtually invisible. Appropriators make no causal contribution to the evil action whose fruits or by-products they appropriate; generally speaking (but not always), at the time they confront the decision about whether to act, the evil act has already been done. The main effect of a decision to appropriate the evil action of another is internal; by choosing to tie their action to the evil act of another, appropriators shape their characters in a way that may not have immediate, tangible consequences in the external world. In short, the immediate impact of the decision to appropriate the illicit act of another is a deeply interior one; it alters the character of the appropriator.[21]

To summarize, appropriation of evil in its strictest sense is not about contributing to, but about benefiting from evil. In cooperation cases, the obvious evil to be done is prospective, while in appropriation cases the gravely wrong act has already happened. However, the appropriator now becomes the principal agent (compared to the cooperator, who remains an auxiliary agent), and is faced not so much with an external and visible problem, but with a more internal and intangible one, of how to justify his profiting from a grave evil already committed.

The moral problems of appropriation of evil as outlined by Kaveny are as follows. First, she reviews the principles of an intention-based, agent-centered morality with respect to cooperation in evil. She argues that the revival of a virtue-oriented approach to ethics has helped elucidate features of the cooperation matrix that would not make sense if based on a purely externalist approach:

> As part of its heritage from Thomas Aquinas, Catholic moral thought conducts its analysis of human action from the perspective of the agent who performs the action, not from the perspective of those who suffer its consequences. Accordingly, Catholic thought employs an intention-based action theory; it analyzes an action under the description provided by an agent's own account of what he or she is *doing*—that is, a description of this purposeful activity that situates it within a broader framework of the agent's near and distant goals. Furthermore, as Aquinas recognized, human actions have a power that goes beyond their

[20] Ibid., 287 (original emphasis).

[21] Ibid., 288–289.

> immediate consequences in the external world, no matter how significant those might be. The actions we perform over the course of our lives shape our very moral identities by building up or eroding the good and bad habits commonly known as virtues and vices. In turn, the habits we develop greatly influence the moral character of our future actions. [22]

Thus, in cases of material cooperation where there are foreseen but unintended evil consequences, even if such cases are justified as licit, the risk of *desensitization* becomes greater.[23] Kaveny also rightly combats the externalist view that if the evil is committed anyway, and it is not strictly dependent on the cooperator's action for its accomplishment, then the cooperator's action bears little moral content:

> If we were to focus only on the external structure and effects of an action, one aspect of that matrix would assume paramount importance: whether or not the illicit act would take place even if it received no help from the cooperator's action. This consideration *is* a factor, but it is not decisive either way. In some cases, material cooperation is permissible despite the fact that a decision not to cooperate would thwart the illicit intentions of the principal agent. In other cases, material cooperation is not legitimate, despite the fact that the principal agent would find another way to accomplish his or her wrongdoing. The manualists were not only concerned about whether or not the evil act would occur without the cooperation, but also struggled to evaluate how the connection to the evil act of another would affect the character of the cooperator. Moreover, other elements of the cooperation matrix direct our attention to additional factors that illuminate the way in which the potential act of cooperation will alter the cooperator's character. The categories of immediate/mediate cooperation, as well as that of proximate/remote cooperation, concentrate our focus in just this way.[24]

Kaveny explains that this problem of *moral contamination* by intimacy with the principal agent's evildoing "is only intelligible if one recognizes the close connection between action, habit, and character, as well as the degree to which each agent's description of his or her own intentional acts can be affected by others' perception of what he or she is doing."[25] She describes the two basic components of this contamination: *seepage* and *self-deception*, the dangers of which highlight the concern "to

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[22] Ibid., 302 (original emphasis).

[23] "This is not to say, of course, that performing an action that foreseeably but unintentionally results in the death of a human being is not an extremely serious matter, or even that it is not wrong in the vast majority of cases. Even in the rare situations where performing such acts are justifiable, so doing is fraught with moral danger. Agents who engage in this type of action, particularly if they do so repeatedly, can accustom their minds and hearts to causing the death of another human being, albeit unintentionally. They can easily become desensitized to the sanctity of life, making it easier for them to choose acts that are deliberately disrespectful of other persons in the future. If the experience of committing murder is corrupting, the experience of causing the death of a fellow human being can be brutalizing, even if it is justified. While not sinful in itself, it can make sinning in the future far easier." Ibid., 304.

[24] Ibid., 305 (original emphasis).

[25] Ibid.

protect potential cooperators from the corrosive effects that close proximity to evil might have on their own character."[26] By seepage, the description that others may have of the cooperator's assisting in the evil action, though competing with the cooperator's own description, "could 'seep' into the cooperator's moral identity, by affecting the self-conception of the kind of acts of which he or she is capable."[27] Unless the cooperator exercises great vigilance, he or she might become accustomed to viewing the auxiliary action in the terms used by others (e.g., the principal agent may view the cooperator as a true accomplice in his crime):

> Self-deception, the second moral hazard, occurs when the cooperator becomes self-deluded about the nature of his or her own intentions in acting. Particularly if working in very close quarters with the principal agent, it is very difficult for a cooperator not to get swept up into the principal agent's project in such a way that he or she wills its success. If he or she is an employee of the principal agent, the cooperator's career advancement may very well be tied to such success. Rather than candidly acknowledging a sea-change or a gradual shift in his or her moral stance, the cooperator might simply develop an elaborate scheme of self-deceiving rationalization instead.[28]

Kaveny then neatly compiles the moral dangers of appropriation of evil in an almost *mirror-image* fashion. First, while the fundamental moral threat for potential cooperators is *intending* the evildoing of the principal agent, the parallel danger for potential appropriators is *ratifying* the evil of which they make use:

> In the appropriation context, ratification of evil is the equivalent of formal cooperation with evil. For an agent to ratify the action of another involves not only taking up its fruits or by-products and weaving them into his or her own plans and objectives, for that happens in every appropriation case. It also involves stepping into the shoes of the auxiliary agent in a more fundamental manner. When an appropriator ratifies an appropriated action, he or she takes it up and makes use of it under the intentional description it was given by the auxiliary agent. In effect, the action of the auxiliary agent becomes the appropriator's by adoption. In addition, the appropriator may use that action for the same purposes that the auxiliary agent would have used it.[29]

Then, "just as cooperation with evil does not need to be formal in order to be morally problematic, so the moral questions entailed by appropriation of evil are not exhausted once it is determined that the appropriator does not ratify the illicit act of the auxiliary agent."[30] The possibilities of desensitization, seepage, and self-deception are concurrent in appropriation cases, especially recurrent appropriation, no less than they are with cooperation cases:

> If another agent's evil acts contribute in some way to our own objectives, particularly in an ongoing manner, it is difficult not to view them in a more posi-

[26] Ibid., 306.

[27] Ibid.

[28] Ibid.

[29] Ibid., 306–307.

[30] Ibid., 308.

> tive light than we otherwise would. Moreover, it is tempting to accustom ourselves to the benefits that flow from appropriation that we would be inclined to decide against taking steps to eliminate the wrongdoing, if the opportunity presented itself… Similarly, self-deception about one's motives is also possible in appropriation cases.[31]

Kaveny summarizes that the contemporary re-emergence of virtue theory, with its renewed focus on the relationship between act and character, allows us to see the moral dangers that appropriation of evil poses—distinct from but analogous to those that arise in cooperation problems.[32]

The Complicity of the Developer

To develop a cell line using tissue from an aborted fetus, the agent must arrange for tissue to be taken from the dead fetus (assuming that the one doing so is sure that the fetus is already dead) and be delivered to him, or obtain the tissue himself. This entails an intimate intersection of the act of abortion and the act of developing the cell line. Furthermore, there is the issue of obtaining consent for use of fetal tissue, which is usually done before the abortion is performed, given that the tissue is best worked on while it is fairly "fresh,"[33] and that it may not be appropriate to obtain consent after the abortion because of the potential emotional stress of the mother. In fact, in modern institutional settings, an official protocol outlining the various steps in obtaining fetal tissue from abortions would have to be formalized before implementation. Hence, even though the developer of the cell line may not actively contribute to the actual performance of the abortion, his association with it is too proximate to be morally licit. I argue that, by this voluntary proximity (since he aims to get the fetal tissue) and by his not actively opposing the abortion, the developer of the cell line cooperates with the abortion by a grave omission on his part—an omission *at least* tantamount to illicit passive immediate material cooperation.

It would also not be difficult to imagine the developer's eagerness to proceed with his scientific task such that he actually desires the abortion to take place. He may have to meet certain research deadlines, or he may have tried unsuccessfully for the past three months to generate a cell line with certain characteristics and now needs more fetal tissue. He may thus desire that more abortions take place (since

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[31] Ibid., 307.

[32] Ibid., 289.

[33] "From a clinical standpoint, according to Dr. C. Ward Kischer, Ph.D., one of the leading authorities in the nation on human embryology, the abortion must be pre-arranged in order to have researchers available to immediately preserve the tissue.... 'In order to sustain 95% of the cells, the live tissue would need to be preserved within 5 minutes of the abortion,' stated Dr. Kischer. 'Within an hour the cells would continue to deteriorate, rendering the specimens useless.'" Debra Vinnedge, quoting from her interview with Dr. Kischer at the American Life League conference, July 12, 2002; in Anthony Zimmerman, "Using Vaccines from Aborted Babies Makes Mephistophilus Laugh Again," http://www.cogforlife.org/zimmerman.htm. Dr. Kischer is associate professor emeritus of cell biology and anatomy at the University of Arizona College of Medicine in Tucson.

some women may not give consent or the fetuses may not be suitable for obtaining tissue), or that an abortion takes place on a particular date so that he can continue his work. In this circumstance one cannot say that it is mere *prediction* that the abortions will take place.[34] This desire (or *wish*) cannot be morally neutral, since it is not just confined to a desire for research to proceed but is intimately coupled to the specific means to achieve it—that is, the abortion. The cell line developer in this case would commit formal cooperation since his desire for the abortion to take place is there, and his omission in not opposing the abortion is culpable because he chose to be proximately connected to the act. The claim that the agent does not intend the abortion since he exerts "absolutely no control over the decision to go forward with the procedures performed by the clinic" is therefore untenable in this context.[35] For example, did the cell line developer try to dissuade the woman from having the abortion when she signed the consent form to obtain tissue? Similarly, it does not seem consistent to say "I had no control over the abortion," and then eagerly wait in the operating room for the abortionist to hand over the fetus![36]

Antonio Spagnolo, writing for *L'Osservatore Romano* on the use of fetal tissue for transplants, comments on this inevitable problem of complicity, especially with respect to the obtaining of consent:

> In this regard, three reasons are adopted, linked with the informed consent which must be requested from the woman (which is the true and unavoidable point of connection between the two actions): (1) the very dynamics of the process of acquiring informed consent from the woman makes impracticable the recommendation to seek this consent [at] only a certain moment and not earlier; (2) the information publicized by the mass media on foetal tissue transplants, familiar to women who seek abortion, is such as to vitiate the care taken by health-care workers not to influence the woman's decision when asking for her consent to remove foetal tissue after the abortion; (3) finally, the much vaunted principle of the woman's autonomy requires her to be totally informed on all the decisions to be taken concerning the use of the tissue of "her" fetus, thereby establishing a strong bond between her and the research physician who requests her consent.[37]

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[34] Kaveny, "Appropriation of Evil," 297–300.

[35] Ibid., 301.

[36] "Firstly, one must consider morally illicit every form of *formal* cooperation (sharing the evil intention) in the action of those who have performed a voluntary abortion, which in turn has allowed the retrieval of foetal tissues, required for the preparation of vaccines. Therefore, whoever—regardless of the category to which he belongs—cooperates in some way, sharing its intention, to the performance of a voluntary abortion with the aim of producing the above-mentioned vaccines, participates, in actuality, in the same moral evil as the person who has performed that abortion. Such participation would also take place in the case where someone, sharing the intention of the abortion, refrains from denouncing or criticizing this illicit action, although having the moral duty to do so *(passive formal cooperation).*" Pontifical Academy for Life, "Moral Reflections," 546.

[37] Antonio G. Spagnolo, "Foetal Tissue Transplants and Abortion," *L'Osservatore Romano,* February 8, 1995, English edition.

He thus concludes that formal cooperation is inevitable in this scenario:

> However, in the case of the removal of foetal tissue after deliberate abortion, the team removing the tissue itself is led by technical necessity to come to an agreement with whoever kills the foetus (the gynecologist and the woman) … Consequently the impossibility of completely separating foetal tissue removal and deliberate abortion inevitably involves the formal complicity of the person removing the tissue with the abortion itself. In other words, this act is *intrinsically* immoral, since someone who has deliberately chosen to remove and utilize the tissue of intentionally aborted fetuses necessarily shares in some way the intention of the person having the abortion: he does nothing to save the foetus that he knows will be aborted but, on the contrary, plans together with the patient the best time and way to remove the tissue. And this also applies even if the decision to abort is not primarily intended for the removal of tissue, even if the death of the foetus was certified and occurred before the tissue removal and was not caused by it, even if the time and method of abortion were not influenced by the subsequent removal.[38]

One realizes the degree of formal complicity when examining the circumstances surrounding the creation of the rubella vaccine RA 27/3. The number of abortions involved before a final successful result was achieved lends credence to the claim that the entire process had to be intentional and well orchestrated. The rubella virus was obtained from the aborted embryo of a mother exposed to rubella and later grown on WI-38, a cell line again developed from the lung tissue of an aborted baby girl of three months gestational age.[39]

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[38] Ibid.

[39] "The isolation and characterization of human diploid cell strains from fetal tissue make this type of cell available as a substrate for the production of live virus vaccines. Other than the economic advantages, such strains, in contrast to heteropoloid cells lines, exhibit those characteristics usually reserved for 'normal' or 'primary' cells and therefore make the consideration of their use in the production of human virus vaccines a distinct possibility." L. Hayflick and P. S. Moorhead, "The Serial Cultivation of Human Diploid Cell Strains," *Experimental Cell Research* 25.3 (December 1961): 618; "This fetus was chosen by Dr. Sven Gard, specifically for this purpose. Both parents are known, and unfortunately for the story, they are married to each other, still alive and well, and living in Stockholm, presumably. The abortion was done because they felt they had too many children. There were no familial diseases in the history of either parent, and no history of cancer specifically in the families." Dr. S. Plotkin, answering a question on the origins of WI-38, in "Gamma Globulin Prophylaxis; Inactivated Rubella Virus; Production and Biologics Control of Live Attenuated Rubella Virus Vaccines" [no author given], *American Journal of Diseases of Children* 118.2 (August 1969): 378; "One of my duties as a young student in the laboratory in Stockholm was to dissect human fetuses from legal abortions and send organs to the Wistar Institute. Such material was the source of many important studies of cell lines at the Institute, such as Leonard Hayflick's study of WI-38 cells." Erling Norrby, review of *Listen to the Music: The Life of Hilary Koprowski*, by Roger Vaughan, *Perspectives in Biology and Medicine* 44.2 (Spring 2001): 304–306; "Virus was obtained from an aborted rubella-infected human fetus. The twenty-five-year-old mother was exposed to rubella eight weeks after the last menstrual period. A macular rash and lymphadenopathy developed sixteen days after exposure, and rubella virus was isolated from her nasopharynx … The fetus was surgi-

If in fact the embryo or fetus is still alive while tissue is being extracted from it then the one doing so commits an even more serious act of violence directly to another living human being. This might happen, since it seems to be a scientific criterion that tissue be obtained in a viable state to be suitable for research.[40]

The developer of such cell lines both cooperates in and appropriates the evil of abortion. The degree of collaboration between developer and abortionist is so close that the ratification of the abortion by the developer is unavoidable. The dangers of desensitization, seepage, and self-deception may not even be relevant, because this proximate and formal collaboration already implies that the developer has sanctioned the abortion.

The Complicity of the Market

Those who are involved commercially in selling or distributing the cell lines, such as companies in the biotechnological industry, have vested financial interests in the products. The appropriation of the evil of abortion is obvious and occurs on a corporate scale, with several or many individuals involved. The greater the financial gain, the greater the appropriation of the evil act, with all its implications for harming the character of each involved person, and the ensuing dangers of desensitization, seepage, and self-deception. Grave injustice is involved in reaping profits from such direct by-products of a willful abortion. One can argue that by accepting such a product from the developer of the cell line in order to market it, there is already ratification of the developer's act, which is one of grave complicity with respect to the abortions.

If the company marketing a cell line becomes involved in an intentional and prospective process of obtaining such products from the developer, then this approaches formal cooperation in abortion. Also, since there is a demand for products of induced abortions, the company becomes part of a market force that may encourage future abortions to take place. There will be more to the process than just *predicting* that a steady rate of abortions will occur. Commercial factors could impel the com-

cally aborted seventeen days after the maternal illness and dissected immediately. Explants from several organs were cultured and successful cell growth was achieved from lung, skin, and kidney … This harvest was inoculated on stationary WI-38 diploid lung fibroblasts, to initiate infection in these cells." Stanley A. Plotkin, David Cornfield, and Theodore H. Ingalls, "Studies of Immunization with Living Rubella Virus: Trials in Children with a Strain Coming from an Aborted Fetus," *American Journal of Diseases of Children* 110.4 (October 1965): 381–382; "Explant cultures were made of the dissected organs of a particular fetus aborted because of rubella, the 27th in our series of fetuses aborted during the 1964 epidemic. The third explant, which happened to be from kidney, was selected arbitrarily for further study." Stanley A. Plotkin, et al., "Attenuation of RA 27/3 Rubella Virus in WI-38 Human Diploid Cells," *American Journal of Diseases of Children* 118.2 (August 1969): 178.

[40] "The need for foetal tissue to be in an excellent state of preservation and fully viable would imply that at the time of removal the foetus would have to be in a viable state. This would lead to a strong suspicion that the removal of the foetus was its 'cause of death.'" Spagnolo, "Foetal Tissue Transplants and Abortion."

pany to put pressure on the developer or on an abortion clinic to deliver the goods by a certain time.[41] Not opposing the marketing and distribution of such cell lines, and not looking for alternative ethical sources, is also a grave omission.[42]

The Complicity of the Researcher

Of the three agents discussed in this article, the complicity of the researcher is the most contentious A research fellow, a scientist, or a laboratory technician involved in a scientific experiment with noble aims per se finds that one of the materials he must use in the experiment is the HEK 293 cell line (or the PER.C6 cell line), which has long since been commercialized and is in widespread use. Should he use it? It could be argued that this agent is remote from the evil of abortion. He surely did not cooperate with abortions that occurred three decades ago. How can an innocuous-looking group of cells in a flask be an ethical issue?

First, is this agent really that remote? A product like a cell line, which is easily frozen for storage, and is multiplied in culture media and distributed to multiple users, hides its true proximity to the grave evil by these inherent physical characteristics. The agent may thus seem far removed from the original event in time and place, but in reality he is not far removed in terms of complicity. If the developer of the cell line is immediate to the abortion, followed closely by those who market the cell line, the end user in the laboratory does not seem that remote after all. The end user in fact supports the prior actions of developing and marketing the cell line by buying or using the product. If there were no market provided by the end users, there would be no cause for commercializing the cell line. There is thus a direct, even proximate intersection of the actions of the end user and those who traffic the cell line. As one could well consider the developer and the commercial company to be one "complex agent," this puts the end user proximate to the developer of the cell line, and thus closer to the abortionist.

If we apply the principles of appropriation as outlined by Kaveny, the moral issues for an individual end user are better grasped. It is not a matter of the external world being affected by whether he uses the cell line or not, but a matter of his own interior quality of character. Applying the virtue theory, the researcher in the laboratory

[41] "As regards the preparation, distribution and marketing of vaccines produced as a result of the use of biological material whose origin is connected with cells coming from foetuses voluntarily aborted, such a process is stated, as a matter of principle, morally illicit, because it could contribute in encouraging the performance of other voluntary abortions, with the purpose of the production of such vaccines. Nevertheless, it should be recognized that, within the chain of production-distribution-marketing, the various cooperating agents can have different moral responsibilities." Pontifical Academy for Life, "Moral Reflections," 546.

[42] "However, there is another aspect to be considered, and that is the form of *passive material cooperation* which would be carried out by the producers of these vaccines, if they do not denounce and reject publicly the original immoral act (the voluntary abortion), and if they do not dedicate themselves together to research and promote alternative ways, exempt from moral evil, for the production of vaccines for the same infections. Such *passive material cooperation,* if it should occur, is equally illicit." Ibid., 535.

himself becomes the focal point of judgment. He has to decide if his benefiting from the evil of an abortion can be justified in the context of his work. There will at least be the risk of desensitization, seepage, and self-deception, and more so with recurrent or long-term use of the cell line. Germain Grisez discusses the injustice to the unborn child caused by those seeking to benefit from the evil act of abortion.[43] Although it may sound far-fetched to say that the end user ratifies the abortion, it does not take much to imagine how he ratifies the developer-commercial company complex. In fact, the HEK 293 cell line was created precisely for research (as was PER.C6 for the pharmaceutical industry), and the end user does use it for that purpose.[44]

It may be argued that the end user does not cooperate in the evil of abortion since the incriminating event is in the past. However, abortion (and the likely generation of cell lines similar to HEK 293) is an ongoing practice, which should be universally opposed. It does not make sense for pro-life laboratory researchers to appropriate the by-products of abortion. Kaveny alludes to how *this appropriation may lead to actual cooperation in an evil that continues* as we speak:

> The fact that fetal remains can be put to a worthy scientific use may make those who decide to perform or obtain abortions less likely to reconsider their moral views on the issue. Moreover, it also creates additional possibilities for seepage and self-deception on the part of the researchers. Precisely because the widespread practice of elective abortion generates a stable, long-term supply of aborted fetuses that would otherwise be unavailable, it would be very easy for the researchers to begin to view that practice more positively than they otherwise would. They might also come to depend upon the amount of fetal tissue it produces for their work in a way that would mute their opposition to the practice, or hamper their effectiveness in opposing it should the occasion for them to do so arise.[45]

The Vatican reminds the end users of the duty to decry and oppose biological products using morally illicit sources, and warns that we could be guilty of passive cooperation in the "culture of death" if we do not do so.[46] In fact, analogous to the case of vaccines, we can say that the use of (and hence generation of a demand for) cell lines developed from fetal tissue from procured abortion constitutes at least an immediate passive

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[43] Germain Grisez, "May a Researcher Use Tissue from Deliberately Aborted Fetuses?," question 85 in *The Way of the Lord Jesus,* vol 3*: Difficult Moral Questions* (Quincy, IL: Franciscan Press, Quincy University, 1997: 385–388.

[44] In his testimony before the VRBP Advisory Committee, van der Eb stated: "Again, I remind you that both cell lines [HEK 293 and PER.C6] were made in my lab for different reasons. The objective, as I indicated, for 293 was basic research, and we have done many different transformation studies after that, not transformation studies, but gene expression studies with human embryonic kidney cells in the years following that up to now, I would say. PER.C6 was made just for pharmaceutical manufacturing of adenovirus vectors" (94). "I realize that this sounds a bit commercial, but PER.C6 was made for that particular purpose" (95).

[45] Kaveny, "Appropriation of Evil," 310.

[46] "We have a responsibility for the sins committed by others when we cooperate in them: by participating directly and voluntarily in them; by ordering, advising, praising, or approving them; by not disclosing or not hindering them when we have an obligation to do so; by protecting evil-doers," *Catechism of the Catholic Church*, n. 1868.

material cooperation with regard to their marketing.[47] A similar statement had previously been issued with regard to biological products related to embryonic *stem* cells.[48]

Edward Furton, in his discussion on vaccine production, also talks about the grave complicity of the researchers who use these cell lines with the evil of abortion.[49] Former abortionist Bernard Nathanson argues that "it is impossible to sepa-

[47] "However, in this situation, the aspect *of passive cooperation* is that which stands out most. It is up to the faithful and citizens of upright conscience (fathers of families, doctors) to oppose, even by making an objection of conscience, the ever more widespread attacks against life and the 'culture of death' which underlies them. From this point of view, the use of vaccines whose production is connected with procured abortion constitutes at least a mediate remote passive material cooperation to the abortion, and an immediate passive material cooperation with regard to their marketing. Furthermore, on a cultural level, the use of such vaccines contributes in the creation of a generalized social consensus to the operation of the pharmaceutical industries which produce them in an immoral way. Therefore, doctors and fathers of families have a duty to take recourse to alternative vaccines (if they exist), putting pressure on the political authorities and health systems so that other vaccines without moral problems become available. They should take recourse, if necessary, to the use of conscientious objection with regard to the use of vaccines produced by means of cell lines of aborted human foetal origin. Equally, they should oppose by all means (in writing, through the various associations, mass media, etc.) the vaccines which do not yet have morally acceptable alternatives, creating pressure so that alternative vaccines are prepared, which are not connected with the abortion of a human foetus, and requesting rigorous legal control of the pharmaceutical industry producers." Pontifical Academy for Life, "Moral Reflections," 547–548.

[48] "*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: prescinding 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. In conclusion, it is not hard to see the seriousness and gravity of the ethical problem posed by the desire to extend to the field of human research the production and/or use of human embryos, even from an humanitarian perspective," Pontifical Academy for Life, "Declaration on the Production and the Scientific and Therapeutic Use of the Human Embryonic Stem Cells" (August 24, 2000) (original emphasis).

[49] Furton, "Vaccines and the Right of Conscience," *National Catholic Bioethics Quarterly* 4.1 (Spring 2004): "I had previously said in my writings … that the activity of the tissue researchers who produced WI-38 and MRC-5 was wrong because it constituted immediate material cooperation in the intrinsically evil action of abortion. A more detailed review of the evidence … suggests that the tissue researchers played a much more direct role in the culture of abortion than I had realized. Hence, I revise my view to say that those tissue researchers were engaged in immoral formal cooperation with abortion. The activity of those who established these cell strains should be distinguished from that of the researchers who used them to invent the new vaccines. The latter, I continue to hold, were engaged at the level of immoral proximate material cooperation" (58, footnote 11). "There is, nonetheless, some reason to think that even this type of research would be too closely associated with the evil of abortion, for it is possible that, supposing that the research is successful, others would be led to believe that the use of aborted fetuses is justifiable in view of the good that it can produce. Although the researchers would have no intention of

rate the issue of abortion from the use of the tissue obtained therefrom."[50] Nathanson further cites examples whereby even the data (i.e., the intellectual property) obtained from experiments involving severe cruelty should not be used by those of good moral conscience.[51]

Will the End User Cause Scandal?

According to the *Catechism of the Catholic Church*, "scandal is an attitude or behavior which leads another to evil."[52] It is "some word or deed (whether omission or commission) that is itself evil or has the appearance of evil and provides an occasion of sin to another."[53]

The lack of responsibility in positively identifying the elements of one's work as licit material and the known use of material derived from a voluntary abortions are clear and direct attacks on right conscience. They effectively undermine the protest against abortion and contribute to the ambiguous thinking that is making it very difficult to stop the wave of new research based on morally tainted materials, and will make it impossible to stop the use of products from this research and development. A grave deformation of conscience is occurring because of a failure to face the gravity of this phenomenon.

Anyone who conscientiously objects to abortion, or has a sense of the natural laws, let alone the Faith, could be scandalized by those researchers who use the HEK 293 cell line. Their proximate association with those who market these cell lines, and more remotely with abortion providers, even if it is one of passivity, cannot be totally swept under the carpet. In this, we are duly reminded:

> Catholic health care institutions need to be concerned about the danger of scandal in any association with abortion providers. [54]

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cooperating with abortion, their work could still encourage the practice of using aborted fetuses in research programs" (59).

[50] Bernard Nathanson, M.D.,"Nothing Wasted," *The Hand of God* (Washington D.C.: Regnery Publishing, Inc, 1996): 167.

[51] "Dr. Josef Mengele, from 1943 to 1945, carried out experiments on twins, dwarfs, and prisoners with other assorted genetic anomalies, and a considerable corpus of data was amassed with these experiments. Leaving aside the issue of the scientific design of the experiments (grievously flawed, for the most part) and the validity and reliability of the conclusions flowing form those data (fragile at best, and largely unreliable at worst), the manner in which the experiments were conducted and the data collected were so irretrievably tainted that ordinary conscience forbids the use of these data. In March 1988 Lee Thomas, the chief of the Environmental Protection Agency, barred from an EPA report on a particular toxic gas any data that the Nazis acquired in experiments on concentration camp subjects with toxic gases." Ibid., 168.

[52] *Catechism of the Catholic Church*, n. 2284.

[53] Dominic M. Prummer, O.P., *Handbook of Moral Theology* (Cork, Ireland: Mercier Press, 1956), n. 230

[54] U.S. Conference of Catholic Bishops, *Ethical and Religious Directives for Catholic Health Care Services*, 4th edition (Washington, D.C.: USCCB, 2001), directive 45.

> In making a judgment about cooperation, it is essential that the possibility of scandal should be eliminated.[55]

The same would apply to individual researchers.

Neither can we use the argument that many other researchers use the questionable cell lines without apparent reservations.[56] We cannot assume that the scientific community has been using HEK 293 *in good faith*. They are also doing the same with PER.C6 and a host of other cell lines (stem cell or not) from embryos obtained by abortion and in-vitro fertilization procedures.

The use of HEK 293 may give the impression of legitimizing abortion as a source of products used in well-intentioned medical treatments, and of collaborating with the abortion industry. The demand for fetal tissue is created by a life-science industry growing at a rapid pace, not just in obtaining embryonic stem cells, but also in replacing and improving on cell lines such as HEK 293 for research and for use in the pharmaceutical industry.[57] We must avoid collaborating, and as far as possible not even give an impression of such, with those who *exploit* directly aborted fetuses, an exploitation forewarned in *Evangelium vitae*.[58]

Are There Alternatives to HEK 293?

Admittedly, once a scientific or industrial procedure is set in place, it is difficult and perhaps costly to develop an alternative method. Yet however impractical it may be, one should not say that it is impossible. I do not claim to be an authority on this subject, but we have a plethora of science and scientists available today. Do not our exponentially increasing biotechnical capabilities themselves give us greater means to

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[55] National Conference of Catholic Bishops, *Ethical and Religious Directives for Catholic Health Care Services* (1995), appendix.

[56] I do not think that the fact that many researchers all over the world use 293 makes it morally licit for use. Abortions are also performed and contraception is provided around the world. If no one in the scientific community has presented an objection, perhaps no one wanted to, or tried, or bothered. Perhaps they have made a moral concession for the sake of scientific "advancement."

[57] "Beiswanger, "Brief History of IMR-90." In "Vaccines and the Right of Conscience," Edward Furton writes, "Though these lines replenish themselves in culture, they are not immortal. What is to replace them in the future? Will new human cell strains be started that once again have their origin in aborted fetal material?" (60). He continues: "Prospects do not look good. The biotechnology company Crucell N.V. and Aventis Pasteur S.A. are seeking approval from the U.S. Food and Drug Administration to introduce PER.C6, a cell strain made from a fetus aborted at eighteen weeks" (60, note 15).

[58] "It must nonetheless be stated that the use of human embryos or fetuses as an object of experimentation constitutes a crime against their dignity as human beings who have a right to the same respect owed to a child once born, just as to every person. This moral condemnation also regards procedures that exploit living human embryos and fetuses—sometimes specifically 'produced' for this purpose by in vitro fertilization—either to be used as 'biological material' or as providers of organs or tissue for transplants in the treatment of certain diseases." John Paul II, *Evangelium vitae* (March 22, 1995), n. 63.

develop ethical methods in research? Should not our abilities be channeled as much to finding true ethical options in research and medicine as to finding ultimate cures for diseases? Have the users of HEK 293 in research and pharmaceutical development made at least the same effort to get an alternative as the developers of HEK 293 did in establishing it? If we do not look for alternative cell lines now we might never have them in the future.

Yet the seeds of alternative ethical methods may already be out there. If embryonic cells are a necessity in research, then there is at least one researcher who has been trying to obtain and work with them in a more acceptable manner.[59] The efforts of Maria Michejda, M.D., from Georgetown University, in working with bone marrow tissue from naturally miscarried second trimester fetuses should give hope for researchers who do not want to work with morally questionable materials.[60] (In the use of fetal tissue from spontaneous miscarriages, however, certain ethical criteria still need to be respected, as explained by Spagnolo.)[61] In gene therapy, a team from the University of Pennsylvania reported using a non-embryonic cell line with good results in the production of adenoviral vectors.[62] There are alternative viruses that may turn out to be more suitable for gene therapy than adenoviruses (and others which also use embryonic cell lines to grow). The baculovirus system, for example, which does not use HEK 293 or PER.C6 for propagation, could be developed one day for use in gene therapy.[63] Gene therapy has yet to play a major role in standard medical treatment. There are numerous safety issues that need to be resolved.[64] For example, in the cases of HEK 293 and PER.C6, the medical history of the parents of the embryos does not seem to be fully known.[65]

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[59] Maria Michejda, et al., "Comparative Study of Hemopoietic Precursors from Fetal and Adult Bone Marrow: Utilization of Stem Cells Derived from Miscarriages," *Fetal Diagnosis and Therapy* 11.6 (November–December 1996): 373–382.

[60] Maria Michejda, "Spontaneous Miscarriages as Source of Fetal Stem Cells," *National Catholic Bioethics Quarterly* 2.3 (Autumn 2002): 401–411.

[61] "*Donum vitae* … gives precise ethical criteria for the removal of foetal tissue: the verification of death before removal, the consent of parents or of the mother, the absence of any complicity in deliberate abortion, care to avoid the risk of scandal, prohibition of all commercial use," Spagnolo, "Foetal Tissue Transplants and Abortion."

[62] Guang-Ping Gao, Ryan K. Engdahl, and James M. Wilson, "A Cell Line for High-Yield Production of E1-Deleted Adenovirus Vectors without the Emergence of Replication-Competent Virus," *Human Gene Therapy* 11.1 (January 1, 2000): 213–219.

[63] H. Tani et al., "In Vitro and in Vivo Gene Delivery by Recombinant Baculoviruses," *Journal of Virology* 77.18 (September 2003): 9799–9808.

[64] S. Hacein-Bey-Abina et al., "A Serious Adverse Event after Successful Gene Therapy for X-linked Severe Combined Immunodeficiency," *New England Journal of Medicine* 348.3 (January 16, 2003): 255–256.

[65] Discussing the derivation of HEK 293 in his testimony before the VRBP Advisory Committee, van der Eb said: "The kidney of the fetus was, with an unknown family history, was obtained in 1972 probably. The precise date is not known anymore. The fetus, as far as I can remember was completely normal. Nothing was wrong. The reasons for the

The Consequences of the Present Situation

The *consequences* are important because they can be considered part of the circumstances of the action and therefore carry ethical weight.[66] One can foresee the problems of conscience that will result if a clinical treatment involving adenovirus becomes established one day. Similar problems will occur if embryonic stem cell research or cloning leads to the establishment of a cure for a disease. While we have received guidelines on the use of vaccines produced using cell lines developed from aborted fetal tissue, the relative necessity of using these cell lines themselves in the area of research (and not yet treatment or vaccination) is far less.[67]

The danger of the "slippery slope" is far from imaginary. If we accept the use of HEK 293, will we not begin to justify the use of cell lines, such as PER.C6, that were developed under more scandalous circumstances? Those who use HEK 293 out of ignorance or with reference to its "uncertain origins" are only one step closer to using PER.C6, which serves the same purposes and has its advantages.[68] Once the wheels of a scientific procedure have been set in motion, they are extremely difficult to revamp.[69] There will be many who will look upon the condoned use of HEK 293 as a

abortion were unknown to me. I probably knew it at the time, but it got lost, all this information" (81). Responding to a question about the neurological histories of the father and mother of the fetus from which PER.C6 was developed, he said: "The mother was completely normal. That I know and had—there was nothing wrong with the mother. She had at least two children afterwards in the same hospital in Leiden, which were completely healthy. The father was not known, not to the hospital anymore, what was written down, an unknown father, and that was, in fact, the reason why the abortion was requested" (99).

[66] "In a broad sense, both motives and consequences fall under the moral criterion of an action's circumstances. Both are closely connected to the action (the moral object or means), but neither is that action itself. Yet because motive and consequences can have significant moral impact, we consider these two important circumstances apart form the others." Paul Conner, O.P., "The Indignity of Human Cloning," *National Catholic Bioethics Quarterly* 2.4 (Winter 2002): 635–658.

[67] See the Pontifical Academy for Life, "Moral Reflections." For example, there is no proven therapeutic product yet in gene therapy compared to the deemed necessity of vaccines in medicine today; there is no legislation as may be the case for vaccines for infectious diseases; and there will not be a direct public health danger if we not use 293 in gene therapy research, as may be the case for vaccines. Note also that the end users of the vaccine do not see the cell line that is used in the production of the vaccine. In gene therapy research, the researcher handles the cell line directly in the course of his experiments.

[68] F. J. Fallaux et al., "New Helper Cells and Matched Early Region 1-Deleted Adenovirus Vectors Prevent Generation of Replication-Competent Adenoviruses," *Human Gene Therapy* 9.13 (September 1, 1998): 1909–1917.

[69] "Once a particular method of manufacture has been set up, however, it is very expensive and time-consuming to alter it. Thus the executives at these companies did not act prudently when they originally approved the manufacturing process," Furton, "Vaccines and the Right of Conscience," 59.

precedent. Why would we then need to ask about the source of any particular cell line, since the answer may be "ultimately unknown?" Catholics and all conscientious objectors need to set strict standards regarding their use as the only possible defense against the flood of new biological materials and products related to egregious crimes.

The industrial demand for tissue from aborted fetuses has already been mentioned. In ordinary research, cell lines need to be replaced, and the very development of a cell line such as HEK 293 generates demands for more. An inevitable production line set in place in a society which has no qualms about reaping material benefits from the weak and defenseless is alluded to in the *Catechism*, when it talks about the *social* consequences of evil actions.[70] The "structures of sin" have influenced the culture of death to an enormous degree.

Sad to say, the "slippery slope" has already been traversed to a large extent. If many people have become numb and morally "immunized" to the fact that cell lines developed from aborted fetuses have been in use for decades, it is proof of the great harm that the widespread use of HEK 293 and its counterparts have caused. No amount of publicity now about embryonic stem cells can be an indication that society will not go down the same road as it has done with HEK 293, certainly not when the promise of stem cells seems all the more sensational. If we have justified and given in to the use of 293, how can we hope to *stem the tide of embryonic stem cell use*?

Recommendations for Catholic Researchers and Institutions

If I am right in my investigation of the origin of the HEK 293 cell line, it follows that the morality of using it for research is very questionable. There is, in my opinion, a moral duty on the part of *any researcher* to discontinue using this cell line; that moral duty should be particularly clear to Catholic researchers and institutions. Even if it may be extremely difficult to stop or modify the experiments in progress, an immediate cessation of the use of the cell line is the correct and just action to take.

Scientists of good conscience should take up the challenge to find ethical sources of biological material for research, which may be more difficult and time-consuming, but perhaps all the more necessary in these times. Catholic universities should forge a new path for the future of biological research by articulating fully the moral principles that must govern all research, starting with the criteria for licitness of all materials used. Pope John Paul II challenges them:

> Before they can have a cultural influence, professional and ethical values should characterize their teaching activities and interpersonal relationships in the context of university life. They must give a living witness in daily life … in a world which will often be fascinated by [a] utilitarian and pragmatic outlook.[71]

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[70] "Thus sin makes men accomplices of one another and causes concupiscence, violence and injustice to reign among them. Sins give rise to social situations and institutions that are contrary to the divine goodness. 'Structures of sin' are the expression and effect of personal sins. They lead their victims to do evil in their turn. In an analogous sense, they constitute a 'social sin.'" *Catechism*, n.1869 (with reference to *Reconciliatio et Paenitentia,* n. 16).

[71] John Paul II, Address to Italian Catholic Doctors (November 25, 1995), n. 5.

As he further calls for ethical alternative solutions to embryonic stem cell use, the same should apply for other cell lines obtained from aborted fetuses, such as HEK 293.[72] There should be intra- and inter-institutional collaboration between bioethicists, biologists, and especially scientists involved in gene therapy and pharmaceuticals, consolidating the efforts of all who have the same views in the defense of human life and its dignity.

The Vatican's response to the vaccines issue seems to have resulted from the brave conscientious objection of parents who are faced with a mandate by law to vaccinate their children.[73] Researchers in the laboratory should object likewise. They should protest vehemently against the lack of licit options (if that is the case) and should not give in to a climate of ethical nonchalance. Ethics should not be divorced from scientific research.[74] Professionals at the forefront of science and medicine are certainly not among the least of those to whom the challenge is issued to defend and promote the culture of life.[75] The overturning of the current wave of moral indifference in the scientific world depends a great deal on this effort.

[72] "The second topic of your meeting concerns stem cell technology and other innovative therapies. Research in this field has understandably grown in importance in recent years because of the hope it offers for the cure of ills affecting many people. I have on other occasions stated that stem cells for purposes of experimentation or treatment cannot come from human embryo tissue. I have instead encouraged research on adult human tissue or tissue superfluous to normal fetal development. Any treatment which claims to save human lives, yet is based upon the destruction of human life in its embryonic state, is logically and morally contradictory, as is any production of human embryos for the direct or indirect purpose of experimentation or eventual destruction." John Paul II, Address to the Members of the Pontifical Academy of Sciences (November 10, 2003).

[73] "Catholic parents were often challenged by state courts, health officials, and school administrators when they filed religious exemptions for their children for this type of vaccination." E. Sgreccia, letter to D. Vinnedge, June 9, 2005 (p. 550 of this issue).

[74] "In other words, it is necessary to achieve in it that deep unity of faith and life to which the Second Vatican Council refers: 'The Council exhorts Christians, as citizens of both cities, to perform their duties faithfully in the spirit of the Gospel. It is a mistake to think that, because we have here no lasting city, but seek the city which is to come, we are entitled to shirk our earthly responsibilities…. One of the gravest errors of our time is the dichotomy between the faith which many profess and the practice of their daily lives' (*Gaudium et spes*, n. 43)." John Paul II, Address to Italian Catholic Doctors (November 25, 1995).

[75] "Dear university teachers, faith in Christ and the desire to serve life have directed your steps toward a demanding profession. The appeal I made to all people of goodwill in the Encyclical *Evangelium vitae* is especially valid for you: 'What is urgently called for is a general mobilization of consciences and a united ethical effort to [activate] a great campaign in support of life. All together, we must build a new culture of life; new, because it will be able to confront and solve today's unprecedented problems affecting human life; new, because it will be adopted with deeper and more dynamic conviction by all Christians; new, because it will be capable of bringing about a serious and courageous cultural dialogue among all parties' (n. 95)." Ibid., n. 6.