

Human Embryonic Stem Cell Research:

What's Wrong with It?

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Science does not take place in a vacuum. By this truism I do not mean what many would understand by it. I am not referring to the obvious fact that science takes place in society, and that many societies—indeed all “liberal” societies—are awash with competing views about what scientists should or should not be doing. We all know that scientists, especially those working in areas touching matters of fundamental concern to society, are surrounded by a swirl of diverse and inconsistent ideas coming from politicians and policy-makers, lobbyists, academics, interest groups, industry, finance, and “plain ordinary folk.”

When I speak of science as not being done in a vacuum, however, I am referring not to society but to the scientist's own character. For when it comes to a momentous issue such as human embryonic stem cell research, perusal of the literature reveals that far too many scientists *and* bioethicists (who, as supposedly trained philosophers, ought especially to know better) think that all the stem cell researcher should be doing is getting on with his research while leaving it to society somehow to solidify the ethical (and regulatory) quagmire the research leaves in its wake. For some researchers—the Severino Antinoris of this world—the view seems to be that their duty is to try—in the name of scientific freedom—to get away with as much as they can unless and until society, or the law, puts a stop to their endeavours. Most, however, take a more cautious and prudent position, namely that they should keep their heads down and get on with the job of pushing forward the frontiers of discovery in a way that does not cause any fright. For them, the task is not to get too far out of step with what society can tolerate, but to inch forward with their research in the hope that others will do the necessary work of negotiating the conflicting views surrounding that research and nudging the community toward a moral consensus that will gain for the scientist as much freedom as possible.

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Such an attitude is radically misguided. For there is no such thing as a “division of ethical labour” paralleling the division of labour in economics, or finance, or science itself. The scientist is always a human being first, a scientist second. It is not for him, any more than for the rest of us, to leave the hard moral decisions to others. Even when we implicitly trust the moral judgment of another, it is in the end up to us as rational agents to reflect on the opinions passed on to us, in short to *consult our conscience* as to whether, given the arguments, what we do is right or wrong. There is nothing special about human embryonic stem cell (HESC) research in this regard. It is like research on, say, nuclear weapons, or genetically modified crops, or animal experimentation, or any research that has an ethical dimension. The HESC researcher is in no way allowed to go on a “moral holiday” simply because he is not a trained philosopher or does not believe himself competent to assess the moral arguments. Rather, he must listen to those arguments, from whatever quarter they may originate, assess their cogency, and ask himself: “Is what I am doing ethically acceptable?”

The position I will defend in this presentation is that HESC research is unqualifiedly and gravely immoral. Note that by saying “immoral” I am *not* referring to the character or motives of any HESC researchers. I have no doubt that many are motivated by a genuine desire to cure disease and benefit mankind. I also do not doubt that many sincerely believe that what they are doing is anything but wrong. But it is, and neither a motive however innocent, nor a conscience however pure, can make an intrinsically bad act into a good one.

I do not have the space to canvass all of the arguments proposed in the literature in favour of HESC research. Some arguments seek positively to defend it, others to refute the objections to it and so leave open the strong possibility that it is permissible. In my view not a single one of these arguments is sound. I will now go through a selection of them, explaining briefly what is wrong with each one.

First, however, let me start with the straightforward argument against HESC research. I begin with the principle that every innocent human being has an inviolable right to life. In fact every human being has a right to life which is inviolable, but it can be forfeited in certain cases (war, capital punishment, self-defence). So when people speak of the “sanctity of life,” they (should) mean the lives of innocent human beings. The sanctity of life is a principle of equality—equal, unconditional respect for innocent human beings. It is the bedrock of any nation or society that would call itself civilized. No ethical system that lacks the sanctity of life as one of its foundational principles

can avoid implications that are ethically repugnant. A corollary of the sanctity of life is what some have called the principle of solidarity, namely that there is no true sanctity of life without special protection for “the last and the least,” i.e. the most vulnerable and defenceless human beings—the young, the old, the sick, the disabled.¹ A further corollary of the sanctity of life is that no human being should be treated as anything less than an individual with unconditional intrinsic worth and inherent dignity. And this is incompatible with treating human beings as commodities, chattels, pure objects of use, sacrificial victims, or experimental subjects (in the last case without consent).

Now I recognize that there is much room for debate about what these principles mean exactly and how they are to be applied in practice, but even a simple statement of them is sufficient to show their incompatibility with HESC research, at least in any form in which it is currently practised. For such research involves one or more of the manufacture, experimentation upon, and destruction of innocent human beings. These practices are jointly and severally inconsistent with the sanctity of life and the inherent dignity of the human being. As such, HESC research is seriously wrong.

So much for a brief statement of the positive argument against. I will now survey some of the principal objections to the position I have outlined. The first is the obvious one that the embryo is not a human being in the first place. If true, the position I am defending falls at the first hurdle. But is it true? Mere assertion does not make it so. One common defence of the objection is the famous (or rather infamous) argument from twinning, which formed the basis of the UK government’s decision to allow embryo experimentation, and now cloning for research (aka “therapeutic” cloning) up to the formation of the primitive streak.² The idea is that where twinning is possible, there is no individual human being. I will not spend much time on this specious argument, since Dr. Louis M. Guenin has done his best to broadcast its speciousness to all who will listen.³ For cells divide, but that does not show they are not individuals. Lower orders of animal such as worms can be divided, but that does not show they lack individuality. Plants can be split and replanted, but they are still individuals. So why shouldn’t the same be true of human or other embryos?

It might be rejoindered that there is a false analogy: embryos are not mere cells and are not like plants or worms. In one sense this is true, but not in a way that will give succour to the defender of HESC research. I am quite happy to concede that no embryo, least of all a human one, is a mere cell (or lump of cells). More important for present purposes, though, is that the analogy is a perfectly good one when all we are considering are basic properties

common to all organic entities, namely properties of organic growth, development, and perpetuation, what philosophers have traditionally called “vegetative properties.” The mere fact that some organic entity can divide of its own accord, or be divided by an external influence, into conspecific descendants, even if the original ceases to exist in the process, simply does not entail that the original entity is not an individual. Hence the argument from twinning is a failure.

The related “argument from totipotency” fails for a similar reason. Here there is a certain terminological confusion in the literature which can obscure the issue. Embryologists usually reserve the term “totipotent” for the potential of a stem cell, if there be such potential, to develop into a human being in its own right, once removed from the embryo containing it. By contrast, its potential, if there be any, to develop into any differentiated somatic cell is called “pluripotency,” as is its potential to develop into many kinds, though not all, of such cells. In the philosophical literature, however, “totipotency” is often used to cover potential development into any somatic cell and/or a human being.⁴ Scientists and philosophers would do well (a) to refine their terminology here and (b) to use it consistently.

Nevertheless, what HESC defenders mean when using totipotency against individuality is the alleged potential of an embryonic stem cell to develop into a human being in its own right. Yet this argument fares no better than the twinning argument. For one thing, we should note that the claim itself is empirically false.⁵ Embryonic stem cells, once extracted, lack a trophoblast, which is essential for embryogenesis. To develop into a human being they would need supplementation to enable the formation of a trophoblast and other supporting structures. Metaphysically speaking, this means radically changing the nature of the stem cells, in other words turning them into parts of a new, augmented entity that, if itself intrinsically capable of normal embryonic development, would be an embryo.

But suppose this were wrong, and that someone found a way of inducing normal embryonic development in an extracted stem cell without doing anything that radically altered its nature. Suppose, for instance, that someone found the right nutritive environment in which development could take place without further ado. This would still not militate against the individuality of the parent embryo from which the stem cell was extracted. Once again, plants are capable of having many parts removed and regrown into separate and distinct plants, but that does not contradict the original’s individuality. The same is probably true for some lower orders of animal. Even if not, on the hypothesis that it were we would not thereby be entitled to infer that the parent organism was not an individual, absent behavioural indicators to the

contrary. I conclude that the argument from totipotency fails to undermine the individuality of the human embryo.

A different argument is based on the claim that until about four days after fertilization or its equivalent, the blastomeres are not differentiated into embryoblast and trophoblast. But since the trophoblast gives rise to extra-embryonic structures, it is impossible to speak, before such differentiation, of *the embryo*.⁶ Though an interesting argument, it does not work. Note again that there is an empirical question over the implied assumption that embryoblast and trophoblast (or supporting cells in general) are sharply distinguished, the former giving rise to the so-called “embryo proper” and the latter to the placenta and other extra-embryonic structures. But this may not be the case. It seems that the hypoblast⁷ is displaced to extra-embryonic regions, and though it gives rise to extra-embryonic structures such as the yolk sac and allantois, there also appears to be intermingling between the hypoblast and the epiblast: part of the yolk sac is incorporated into the primordial gut of the embryo, and the allantois is incorporated into the embryo as the median umbilical ligament.⁸ Why, then, should we exclude the likelihood of intermingling between embryoblast and trophoblast—or at least between embryoblast and other supporting structures, even though the trophoblast, which forms directly from the trophoblast, is as far as we know fixed? Whatever the details, the point is that one cannot simply assert that before differentiation into embryoblast and trophoblast there is no human individual if, as a matter of fact, *after* differentiation the embryo is still directing or controlling which cells become structures of its body proper and which do not.

Even if there *were* no such intermingling between layers, however, the argument would not go through. For “extra-embryonic” and “embryo proper” are ambiguous terms. What they apply to in fact is the distinction between, on the one hand, structures that belong to the body of the embryo as defined by the boundaries of its head, tail, front and back—that which is the early stage of the mature body—and, on the other, the extra-corporal structures discarded at birth. But supporters of the argument in question conflate this proper usage with the idea that structures that are “extra-embryonic” or do not belong to the “embryo proper” do not, ipso facto, belong to the embryo *at all*. Yet this is false. The placenta, yolk sac, and other supporting structures clearly belong to the embryo, *not* to the mother. Hence the mere fact that in early development they cannot be distinguished from those parts of the embryo that are *not* discarded at birth does nothing to undermine the individuality of the embryo at this early stage. All it shows is that in the first few days of development one cannot distinguish between internal

and external parts of the embryo, i.e. between the embryo's body as defined above and the structures discarded at birth.

The position I defend, then—and I have looked here only at the main arguments against it—is that the embryo is a human being even at the stage that stem cells can be extracted from it. It is a self-contained, self-organizing entity with a full genetic programme giving it the complete intrinsic potential, given only a hospitable environment, to develop into a mature member of its kind.

Nevertheless, when it comes to the moral status of the embryo, by far the dominant view among supporters of HESC research is that the considerations just advanced, even if correct, are irrelevant. Even if the embryo is a human being, it does not possess an unconditional right to life since it is not a "person" in the philosophical sense made notorious by Peter Singer and other bioethicists. The issues can be subtle and complicated here, and I have addressed them at length elsewhere.⁹ So I will try only to summarise my view of the situation. A good place to start is Dr. Guenin's article,¹⁰ in which, after correctly dismissing a number of *bad* arguments in favour of embryo experimentation, he unveils what appears to be a novel argument called the "argument from nonenablement." There are a number of strands to this argument, which I will try to unpick.

The basic thought is that where a couple "donates to medicine" an IVF embryo or one produced from their donated cells, this embryo acquires a new moral status: it becomes what he calls an "epidosembryo," one whose sole existence is now for the sake of the welfare of others. Such an embryo, Dr. Guenin concludes, may be used for research. But why? Here is where the various sub-arguments come into play. One thing Dr. Guenin says is that the embryo is not sentient, lacks a cortex and so cannot form preferences, nor can it adopt ends. Therefore, nothing anyone does to it can discomfort or frustrate it. (Let us leave aside the evident fact that killing it frustrates its life.) Moreover, since there is no "morally significant chance" that it will develop into an infant, there can be no "possible person" that corresponds to an epidosembryo.

Now by referring to "possible persons," Dr. Guenin seems to be bringing in a kind of argument from potential, not from mere possibility. As far as possibility goes, of course the "epidosembryo" is still a possible person—assuming for the sake of argument that it would be a possible person were it not donated for research—because one can easily conceive of a world where it was *not* donated for research and developed into a person! So he must be saying something stronger, namely that in the actual world there is no realistic possibility of the "epidosembryo's" becoming a person—it is not a

potential person. But then it would be a potential person were it not donated. Yet basing a duty to protect an embryo's life on the ground of its being a potential person in the sort of sense Dr. Guenin has in mind is tenuous, for as liberal bioethicists are fond of repeating, a potential X does not necessarily have the rights of an X: a vegetarian who said that because an egg is a potential chicken she may not make an omelette would be philosophically confused. So if Dr. Guenin is serious about protecting at least some classes of embryo, he ought not to take comfort in arguments from potential. Or if he isn't serious, he should take a conceptual shortcut, forget about donation, and argue along with other liberal bioethicists that no embryo is more than a potential person, and thus does not—absent an argument to the contrary—have the rights of a person.

More importantly, though, suppose we assume that potential in the sense understood by Dr. Guenin and other supporters *were* morally significant. Then his argument would have the absurd consequence that a sufficiently malicious and devious scientist could so arrange things as to be allowed to experiment on just about anyone! Following an edifying lecture on "epidosis" (i.e., donation) by our scientist, parents of children who are too young to have "adopted ends" or to "form preferences" (of any meaningful sort stipulated by "personist" bioethicists) could legitimately "donate" them for research. So could the guardians of senile and mentally handicapped humans who have no "morally significant chance" of attaining or recovering "personhood." As for the rest of us, to ensure there is no morally significant chance of our being "caused discomfort" or "frustrated," all our devious scientist with one eye on "epidosis" needs to do is either get us sufficiently inebriated, or wait until we are asleep, and whisk us off to a holding centre from which there is no chance of escape. He could then give us—before sobriety or wakefulness returned—a long-acting general anaesthetic and then experiment on us to his heart's content. I cannot believe Dr. Guenin would welcome this implication of his position, so if he cannot distinguish these cases from that of the "epidosembryo," he had better rethink his argument.

Perhaps he might reply that the cases are different because the kinds of people I have just mentioned—namely, all of us—have *already* adopted ends and formed preferences of a meaningful sort (let us leave aside for the moment the mentally disabled who have never done so), so we have a "stake" in our continued existence that the embryo does not. One occasionally sees this thought in the bioethical literature, but I have always failed to see its force. Why the ethical bias towards the past? One might as well say that a million dollars won in Las Vegas and later spent makes me presently wealthier than if I merely had an excellent chance of winning a million dollars tomorrow.

If anything, the bias should be towards the future: I'd rather have the excellent winning chance though I had no cash right now than be the one whose money is all spent and who has no winning prospect. Unless, of course, I had spent my winnings on useful assets. But then the only worthwhile feature of such assets is that I would be able to sell or use them *in the future*. Yet in the cases I described, there *is* no chance of doing anything in the future with our prior investment in life. We will have become pure "epidospeople."

The objection I am levelling is an application of a general objection I and others have raised elsewhere against "personism": there is no sound conceptual method for regarding embryos as "non-persons" while continuing to regard as "persons"—and hence as worthy of serious moral respect—the drunk, the drugged, the sleeping, the comatose, the senile, the very young, and the severely disabled.¹¹ Some bioethicists, such as Peter Singer, are not too bothered that *some* of the above end up as "non-persons" on this theory, but they have still failed to account for the ones they want to *retain* within the magic circle of "personhood."

Dr. Guenin and other "personists" might want to reply that, unlike embryos, the sleeping and the drugged *do* have preferences; surely it is true to say that even while asleep Dr. Guenin (let's call him "sleeping Lou") still believes the Earth is round. I agree, but the reason why sleeping Lou still has beliefs, desires, and preferences is precisely because he is still in a dispositional state—all you need to do is wake him up and ask him whether, say, he wants to go on living. In other words, his sleeping preferences are grounded in a future-oriented disposition. So why is the embryo any different? Just give it an hospitable environment, wait long enough, and hey presto!—it too will tell you whether it wants to go on living. But, comes the rejoinder, Dr. Guenin has preferences *qua adult*, even while asleep, whereas the embryo has no preferences *qua embryo*. This will not do, since sleeping Dr. Guenin has no preferences *qua sleeping Lou*; rather, he has preferences *qua human* being capable of being roused from slumber into consciousness. So too the embryo has preferences, not *qua embryo*, but *qua human* being capable of developing, given the right conditions, into a *conscious* human being. Human beings are the sort of animal that has preferences. The embryo is a human being. Therefore, the embryo is the sort of animal that has preferences. The same goes even for a severely disabled person who will *never* attain the state of holding conscious preferences. Why? As Jenny Teichman once put it—all cows are mammals, even the bulls.

Here are some more problems with Dr. Guenin's argument from non-enablement that serve to highlight the position defended by opponents of

HESC research. He claims: "There is no moral view of which I know that asserts a duty [on a woman's part, and presumably also on that of the male cell or gamete donor] of intrauterine embryo transfer."¹² From which he concludes that we should respect the woman's "autonomy" to donate her embryo for research. But this, as it stands, is a non sequitur. How does it follow that she is permitted to make such a donation? Does her "autonomy" also allow her to do other things with her embryo, such as donate it for manufacture as Soylent Green to save the world from starvation? Or maybe just to flush it down the sink? What has "epidosis" to do with it, unless one is a utilitarian who believes the ends justify the means?¹³ in which case I am more than happy to argue against *that* (as would Dr. Guenin, who stoutly rejects utilitarianism in his paper).

More generally, Dr. Guenin seems to want to argue that from the absence of a duty of intrauterine embryo transfer it follows that there is no duty to save the embryo's life. Again, this is a non sequitur. And even if it does follow that there is no duty to save its life, it does not follow that the woman, man, or anyone else is allowed to procure the embryo's death, whether by donation or any other action.

Not only are there a number of non sequiturs in Dr. Guenin's argument, but it is also filled with ambiguity and loaded terminology. For instance, he proposes for consideration a "final decision" by a woman and her partner to donate an embryo for research; from which he concludes that the embryo has "left parental control." But "parental control" is ambiguous: does he mean physical or moral control? I would argue that such a decision no more entails a loss of *moral* control and responsibility than the abandonment of a newborn baby (absent the baby's danger of death if retained by the mother, which does not apply to Dr. Guenin's case).

An example of tendentious terminology is given when Dr. Guenin speaks of a "gift to medicine of a *life form* that, were they to *decide* otherwise, *could* become their child."¹⁴ As if the embryo were no more than a chattel, or perhaps an organ like a kidney, that lay within the couple's "gift"—this term handily doing the extra job of playing on our emotional response to the idea of helping to save life by advancing medicine. As if the embryo were no more than a "life form," which helps to distance us from its ontological reality. As if the couple merely had to *decide* its fate, like the emperor and crowds at a gladiatorial combat. As if the embryo *could* become their child but was not their child already.

Again, when Dr. Guenin speaks of the "duty of mutual aid asserted within each of the leading moral views of our time,"¹⁵ he omits to show exactly why that duty does not apply to each and every human being, embryos included.

When he speaks of “the autonomous decision of couples,”¹⁶ he presses the “autonomy button” without explaining whether he really thinks that human liberty and autonomy are not subject to the laws of morality, not least the law of justice that says that the rights of every human being must be respected and never violated—which if it does not apply to the right to life does not apply to anything. Finally—though there are more examples like the above that I could extract from Dr. Guenin’s discussion—he asserts that “we cannot promote any advantage of epidosembryos.”¹⁷ Well, we could save their lives, and that sounds to me like an advantage. But, comes the reply, they are already marked out as *epidosembryos*—as though giving them an exotic name changes their moral status. Here it *looks* as though Dr. Guenin is backtracking on an argument he explicitly—and correctly—rejects earlier,¹⁸ namely that imminent death licenses killing. Of course it doesn’t: if I find my enemy Fred tied to a railway line and a train is approaching, I am not entitled to celebrate my good fortune at his misfortune by untying him, pulling him from the track, and shooting him dead myself! According to Dr. Guenin, who is keen to distinguish, as far as the argument from non-enablement goes, “it is not that death is imminent, but that development is bounded.”¹⁹ A strange distinction, as I implied earlier, for it seems to mean that if death *happens* to be imminent I may not kill, but if I engineer things *myself* so that death is imminent—for that is what “bounded development” euphemistically amounts to—then I am magically free to carry out my designs.

Maybe I am being too harsh here, since it might be claimed that “bounded development” is broader than “imminent death” in the following sense: why couldn’t the couple donate for research, whether destructive or non-destructive, either an embryo, or cells that will be used to produce an embryo, that has intrinsically, or will be induced to have, a limitation on its potential to undergo normal embryonic and foetal development? How could such an entity even be called a human being if it intrinsically lacks the potential for normal human development?

Such is the sort of idea being promoted by William Hurlbut, with his concept of Altered Nuclear Transfer. I think it is too early to say at present what the empirical facts are or will be, but the ethical guidelines should be clear, given what I have argued.²⁰ It would be seriously wrong to take an existing human embryo and deform it, say by interfering with its genome, into what is essentially a handicapped human that will never realize the potential it previously had. Just as it is wrong to do this to an existing human, so it is wrong deliberately to *produce* a human in that condition, say by altering the somatic cell before nuclear transfer. Nor does any person have the right to *hand over* a human embryo for such a purpose, nor to hand over

the precursor cells to such an embryo, which would constitute complicity in the immoral enterprise.

What, though, if the entity created could not even properly be called an embryo at all, not even a deformed one? Here we are at the limits of current knowledge. Perhaps—and it is a huge perhaps—there will be a possibility of harvesting genuinely beneficial and usable stem cells using only somatic cell nuclear transfer and animal eggs or maybe even synthesized trophectoderms (though not human eggs). Here is an activity with which I cannot see any obvious ethical problems, on the large assumption that the created entity was known not to be a human embryo. Should there be any doubt whatsoever, the practice could not be allowed since we should use a principle of prudence in ethics according to which, if we have reasonable doubt whether what we are doing is seriously wrong, we should refrain as a matter of conscience. In particular, if I am about to destroy something and have a realistic suspicion that it might be a human being, I should give the object of my designs the benefit of the doubt. Hence all proposals for Altered Nuclear Transfer or something similar must be treated with extreme caution, and scientists have a responsibility to avoid making or heeding “messianic” proclamations that run the real risk of creating false hopes in the face of substantial ignorance as to what such proposals really entail, both empirically and ethically.

I would like to end with some brief theoretical remarks and then some practical observations. On the theoretical level, I want to emphasize that the principle of equal respect for all persons, in whatever condition and whatever stage of development, is the only foundation on which a civilized morality can be based. No other theory, be it utilitarianism, consequentialism in one of its many guises, contractualism, or even so-called virtue ethics, avoids conclusions that are morally repugnant and an offence to humane values. In particular, once we start trying to isolate certain categories of human being as “non-persons,” as somehow outside the scope of our ultimate ethical concern, we set ourselves on a path that is fundamentally anti-human and inhumane. This is especially the case if we ignore the equal claims of the “last and least,” the most vulnerable among us who are least able to speak for themselves.

When it comes to the human embryo, by seeing it as the person it really is, we do not appeal to its potential to become a mature member of its kind as the *reason* for giving it respect now. The respect is in no wise *prospective*. Rather, its developmental potential merely reflects what the embryo actually is *now*, namely one of us, just as we all were like it at an earlier

stage of our development. The embryo is not a potential person but an *actual* person whose capacities have not yet reached full flowering in actual behaviour. If "personism" is to be used as an ethical term at all, it can only legitimately be used in a way that applies to such an individual as much as to the adult members of its kind, since only such a usage reflects metaphysical and biological reality.

On a practical level, I observe what many have seen already: that biotechnology possesses, even more than nuclear technology, the practical possibility of taking humanity into an abyss from which it will assuredly never escape. Like all human inventions, however, it can also make a real contribution to the common good—in this case health benefits of a kind that were only figments of the imagination barely half a century ago. No biotechnologist can shirk the personal responsibility of deciding for himself what path he wants to go down. He cannot simply ask a philosopher or look in an ethics textbook, because contemporary ethics is far too fragmented even to pretend to be speaking with a unified voice. Nor should he treat morality much as the Greeks and Romans treated their gods, namely as some kind of super-market from which to select the "value system" that best suits his personal prejudices, prior convictions, or the expediency of the times.

On the contrary, in the face of the many material inducements on offer, each biotechnologist *must* listen to all the arguments on all sides, without fear or favour, and make a personal, rational decision as to just what kind of research he wishes to engage in. Fortunately, with developments in adult stem cell research offering real promise, the biotechnologist need not treat stem cells as a no-go area. Nature positively holds out for inspection and admiration the possibility of forms of research that are consistent with fundamental human values. Only the individual scientist can, listening carefully to the still, small voice of conscience, decide whether to take up the offer.

NOTES

1. See Colin Harte, *Changing Unjust Laws Justly: Pro-Life Solidarity with 'The Last and Least'* (Washington, D.C.: Catholic University of America Press, 2005).
2. Prominent adherents of the twinning argument include John Harris, *The Value of Life* (London: Routledge, 1985): 11, and Peter Singer, *Practical Ethics* (Cambridge: CUP, 1993): 156-7, both of whom repeat the argument in many places throughout their writings. The argument formed the conceptual basis of the Warnock Committee's 14-day limit on embryo experimentation: *Report of the Committee of Inquiry into Human Fertilisation and Embryology* (Cmd. 9314, Department of Health and Social Security (UK), 1984). I refuted the argument at length in my "Modal Properties, Moral Status and Identity", *Philosophy and Public Affairs* 26 (1997): 259-98. I have since been informed by several embryologists that they considered the Warnock Committee's reliance on the twinning argument as only ever a political expedient to enable the research to go ahead, rather than as involving an argument with either philosophical or biological

- merit. As long as a cut-off point could be sold to the public, most of the desired research could continue undisturbed.
3. See, e.g., L. Guenin, "The Morality of Unenabled Embryo Use—Arguments that Work and Arguments that Don't," *Mayo Clin. Proc.* 79 (2004): 801-8.
 4. See, e.g., J. Harris, "The Ethical Use of Human Embryonic Stem Cells in Research and Therapy," in J. Burley and J. Harris (eds), *A Companion to Genetics* (Oxford: Blackwell, 2002): 158-74 at 163.
 5. See D.M. Gilbert, "The Future of Human Embryonic Stem Cell Research: Addressing Ethical Conflict with Responsible Scientific Research," *Medical Science Monitor* 10 (2004): RA99-103, at www.upstate.edu/biochem/faculty/gilbert/publications/gilbert_humanES.pdf (accessed 7 Nov. 05).
 6. J. Harris, *The Value of Life*: 11, and *Clones, Genes, and Immortality* (Oxford: OUP, 1998): 47.
 7. The layer of cells adjacent to the epiblast (from which the embryo's body develops) on the side facing the blastocyst cavity.
 8. See further Keith Moore, *The Developing Human* (Philadelphia: W.B. Saunders, 1982; 3rd ed.): ch.7; the observation is repeated in the 5th edition (1993) by Keith Moore and T.V.N. Persaud. I have not checked the 6th edition (1998). The references to Moore and Persaud come from C. Ward Kischer and Dianne N. Irving, *The Human Development Hoax* (2nd ed., 1997; no named publisher): 41-3. Kischer is Associate Professor Emeritus, Cell Biology and Anatomy, University of Arizona College of Medicine. See also Irving, "'New Age' Embryology Text Books: Implications for Fetal Research," *Linacre Quarterly* 61 (1994): 42-62. I am grateful to Dr. Ann A. Kiessling of the Beth Israel Deaconess Medical Center for discussion and clarification of the embryological facts related to this issue.
 9. See D.S. Oderberg, *Moral Theory* (Oxford: Blackwell, 2000): 174-184.
 10. "The Morality of Unenabled Embryo Use": 804ff.
 11. See note 9 and also J.A. Laing, "Innocence and Consequentialism: Inconsistency, Equivocation and Contradiction in the Philosophy of Peter Singer," in D.S. Oderberg and J.A. Laing (eds), *Human Lives: Critical Essays on Consequentialist Bioethics* (London/New York: Macmillan/St Martin's Press, 1997): 196-224.
 12. Guenin, "Morality": 804.
 13. Moreover, as one embryologist explained to me, since all morality was relative it was simply a question of finding a way that allowed scientists to carry on their research in the light of their own personal value systems.
 14. Guenin, "Morality": 804.
 15. *Ibid.*: 804-5.
 16. *Ibid.*: 805.
 17. *Ibid.*: 805.
 18. *Ibid.*: 801.
 19. *Ibid.*: 805.
 20. At the time of writing, the journal *Nature* has just published two articles detailing methods of obtaining stem cells while potentially avoiding ethical difficulties associated with the current techniques destructive of the embryo (*Nature* 437, 20 Oct. 2005). One technique involves using a single-cell biopsy procedure to obtain stem cells without destroying the embryo or affecting its subsequent development. The other involves altering the nucleus before it is transferred to the egg, so that the resultant embryo lacks the ability to implant. Huribut claims that this latter kind of embryo, lacking from its very beginning the developmental potential of a normal embryo, would not have the same moral status. Leaving aside the great factual uncertainty in such cases—e.g. whether in the first case the embryo might not suffer long-term harm (the *Nature* articles concern mouse embryos, it should be added)—it is still the case that the first technique involves experimenting on human beings, and using them for spare parts, without their being able to give consent (let alone the ethical problems with IVF, this being the source for the donor embryos), and the second is wrong for the reasons given above.