

# *Prospects for Pluripotent Stem Cells*

## *A Reply to Communio*

Edward J. Furton

---

A bill recently introduced into the Senate by Rick Santorum and Arlen Specter represents a new turn in the effort to secure pluripotent stem cells. Senate bill 2754, the Alternative Pluripotent Stem Cell Therapies Enhancement Act, proposes to expand funding by the National Institutes of Health for research that promotes “the derivation of pluripotent stem cell lines, including from postnatal sources, without creating human embryos for research purposes or discarding, destroying, or knowingly harming a human embryo or fetus.”<sup>1</sup> The bill specifically mentions “techniques outlined by the President’s Council on Bioethics and any other appropriate techniques and research,” so long as these efforts do no harm to embryonic human life.

The fact that the two senators from Pennsylvania have come to agreement on this matter is very significant. Sen. Specter has generally favored destructive research on living human embryos, while Senator Santorum has rightly rejected this as a violation of human life. That the two recognize promising new avenues of research on the horizon that may enable researchers to obtain pluripotent stem cells without destroying human embryos is good news indeed. Santorum has not compromised his principles; Specter, it seems to me, has come around.

Those of us who want to protect human life at all its stages should support S. 2754 and every other legislative effort that promotes funding of alternative means of obtaining pluripotent stem cells. If scientists can discover a source of these cells that is not morally problematic, it would solve one of the great impasses faced by our nation today: how to advance the science of regenerative medicine in a way that respects the consciences of a majority of Americans.

---

<sup>1</sup> The text of the bill is available at <http://thomas.loc.gov/cgi-bin/query/z?c109:S.2754:>.

Yes, adult stem cells are far more practical than the embryonic. Yes, they are being used even today to cure a great many diseases. And yes, no cures have yet been produced using embryonic stem cells. The hope is merely theoretical. But the desire of the scientific community to work with embryonic stem cells remains strong in view of their potential not only to cure a range of seriously debilitating diseases in the short term, but also to lead to a better understanding of early human development, which could in turn result in other cures in the long term.

### **The *Communio* Debate**

Regrettably, there are those who, despite the promise of these new approaches, have already decided against them. The journal *Communio* has become a major opponent of one of the more promising of these new proposals: altered nuclear transfer–oocyte assisted reprogramming (ANT-OAR). I would like to make some comments on the opposition of *Communio* to these new proposals. I think the journal's opposition is not well considered.

According to the ANT-OAR proposal, a researcher would take an adult cell from the human body, remove its nucleus, alter that nucleus so that it could not give rise to an embryo, and then fuse it with a woman's ovum (which has had its own nucleus removed) so that it would grow into a pluripotent stem cell. The key to the success of this idea is to determine whether the nucleus can be sufficiently altered so that no embryo is formed at fusion; no one wants to accidentally form a human embryo. The editors of *Communio*, however, do not think that this proposal is worth the effort. Santorum and Specter are more optimistic. They would like to see federal funding for animal research on ANT-OAR and similar proposals.<sup>2</sup>

Clearly, animal studies to test ANT-OAR would be moral. Animal studies are critical to determining whether it will be safe to move forward with studies using human cells. Although I will examine below the specific reasons why the editors of *Communio* oppose ANT-OAR, it is generally difficult to understand why their opposition extends even to preliminary experiments on animal cells.

One is left with the impression, in reading the *Communio* critiques of ANT-OAR, that the editors are not examining the evidence on its own merits, but are instead applying certain a priori intuitions to which they are already committed. They are not acting as impartial judges, but rather as partisans. This is evident in the fact that articles written in defense of ANT-OAR and published in *Communio* are routinely followed, usually in the same issue, by an attack on that submission written by one of the editors.<sup>3</sup> This is a very unusual procedure. Many journals run articles pro and con on a disputed topic, but rarely does the editorial staff take such a direct hand in seeking to discredit the views of the authors they publish.

---

<sup>2</sup> The bill favors "a determination of the extent to which specific techniques may require additional basic or animal research to ensure that any research involving human cells using these techniques would clearly be consistent with the standards established under this section."

<sup>3</sup> Thus, Nicanor Austriaco's article, "Altered Nuclear Transfer: A Critique of a Critique," which appeared in the Spring 2005 issue of *Communio* (32.1, 172–176), was rebutted in the same issue by Adrian Walker ("The Primacy of the Organism: A Response to Austriaco," 177–

The editors of a journal are, of course, entitled to their opinions—which are usually expressed in editorials like the one you are reading. But as the editor of *The Quarterly*, I would never issue critiques of articles that I published in these pages just because they disagreed with my own point of view! That would not be a debate, but a public rebuking.<sup>4</sup> I confess that I have been surprised at the willingness of the defenders of ANT-OAR to submit themselves to what is clearly unfair treatment in *Communio*.

### A Critique of My View

I have not submitted anything to *Communio* for publication during this debate, but Adrian Walker, one of the editors there, has taken me to task for a brief editorial that appeared in the Autumn 2005 issue of *The Quarterly*.<sup>5</sup> That is well and good, and the debate is worth having. But I remain convinced that the *Communio* editors stand in opposition to something that they do not fully understand. Theirs has been an intuitive reaction, rather than a reasoned objection grounded in consideration of the facts.

In what follows, I first discuss some of the comments directed by Walker against my editorial. Then I look at his fundamental misunderstanding of ANT-OAR. I do not expect to change his views or those of David Schindler, *Communio*'s editor-in-chief. Their opinions seem to be set. My aim is rather to examine the premises from which they critique ANT-OAR and try to dispel some of the fears they have engendered among pro-life leaders. Even if ANT-OAR should prove to be an unsuccessful proposal, these observations may become important in future debates about other new ways to obtain pluripotent stem cells. Because of the nature of their opposition, we can expect the editors of *Communio* to oppose those proposals as well.

One of the complaints directed against me by Walker is that I have pointed out that the editors of *Communio* use harsh language in their criticisms of their opponents, and he seeks to reassure me that this is not the case. I would take him at his word, except that David Schindler has recently suggested, in a letter to *Crisis* maga-

---

187). Similarly, an article by Christian Brugger, "ANT-OAR: A Morally Acceptable Means for Deriving Pluripotent Stem Cells," in the Winter 2005 issue (32.4, 753–769), was immediately rebutted, again by Adrian Walker ("Reasonable Doubts: A Reply to E. Christian Brugger," 770–783). Another article in that issue, by Stuart W. Swetland and William L. Saunders ("Joint Statement on the Oocyte Assisted Reprogramming Proposal: A Response to Criticisms," 744–752), is the only paper that has not yet been rebutted, although I expect it will be.

<sup>4</sup>The readers of *The Quarterly* will notice that in the Spring 2006 issue we ran a lengthy letter in the Colloquy section titled "A Critique of Oocyte-Assisted Reprogramming," by William Burke, M.D., Patrick Pullicino, M.D., and Rev. Edward Richard. In the current issue there is an article by Lawrence Masek titled "A Contralife Argument against Altered Nuclear Transfer" (235–240); and John Travaline, M.D., who writes the medical Notes & Abstracts column in this issue, expresses his doubts about OAR there (365–374). All of these criticisms have appeared without accompanying critiques by me, although our readers are always welcome to respond to what appears in these pages.

<sup>5</sup>Edward Furton, "A Defense of Oocyte-Assisted Reprogramming," *National Catholic Bioethics Quarterly* 5.3 (Autumn 2005): 465–468. Adrian Walker replied to this editorial in "Who Are the Real Aristotelians? A Reply to Edward J. Furton," *Communio* 32.4 (Winter 2005): 784–794.

zine, that the advocates of ANT-OAR are so eager to obtain embryonic stem cells that, as he puts it, they are willing to tolerate a certain “number of homicides.”<sup>6</sup> What a remarkable claim! How many people are we willing to kill? He does not say. Would it do any good to reaffirm that all of the signatories to the ANT-OAR proposal are strongly pro-life? Probably not. Schindler’s words are an example of the rhetorical excess that continually tempts the editors of *Communio*.<sup>7</sup>

But Walker also captures my main concern. The editors there appear to be taking refuge in a shadowy realm of “ontology,” whose very obscurity and incomprehensibility make it impossible for others to critique their position. In his latest response to me, however, Walker has given us the clearest expression of his opposition to ANT-OAR that I have yet seen from an editor of *Communio*. So let me focus on the legitimate concerns he raises. If ANT-OAR and similar proposals are to gain the necessary political traction, and overcome the willingness of many to use human embryos as mere research materials, we must be able to explain why ANT-OAR deserves a fair consideration.

Those who propose ANT-OAR (and other similar techniques) begin with the basic premise that certain products that result from fertilization are not human beings.<sup>8</sup> Teratomas, for example, are not human beings, but tumors. A complete hydatidiform mole may be removed from a woman’s uterus without any concern for the loss of human life.<sup>9</sup> This is because there simply is no human life present in a cancerous tumor. If such growths could be produced in the laboratory, and made to grow pluripotent stem cells, then obviously we could harvest those cells without destroying any human being.

No one who supports ANT-OAR pretends that he knows ahead of time what the results of the animal experiments will be. Ours is not an ideological approach. We openly state that there is an objective criterion by which we can distinguish between the success or failure of any such approach. Specifically, we call for studies on animal cells to determine whether what results from ANT-OAR is a totipotent or a pluripotent cell. If a totipotent cell results, it will mean that an animal embryo has

---

<sup>6</sup>“Permissible Stem Cell Research?” *Crisis* 24.3 (April 2006): 3. To be accurate, Schindler believes that OAR supporters generally oppose homicide, except when homicides are “statistically negligible. In other words, if the destruction of human beings can be kept to a sufficient minimum, OAR research should go forward.” Walker says in his reply to me that the editors of *Communio* “nowhere accuse OAR supporters of harboring ‘a desire to clone and destroy human beings,’” but that is clearly Schindler’s accusation. Homicide, as I understand it, is the willful destruction of an innocent human being.

<sup>7</sup>For another example of excess, Walker says that I should address the opponents of ANT-OAR directly, “rather than accuse [them] of personal rancor or arrogant stupidity” (“Real Aristotelians?” 794). I made no such remarks.

<sup>8</sup>See Nicanor Austriaco, “Are Teratomas Embryos or Non-Embryos?” *National Catholic Bioethics Quarterly* 5.4 (Winter 2005): 697–706.

<sup>9</sup>Molar pregnancies are uncommon, but occur when there is fertilization of an ovum that lacks maternal chromosomes, leaving a 46XX karyotype teratoma composed only of paternal chromosomes, enough to form a placenta but not a fetus. The result is a mass of tissue with grape-like swollen villi.

been formed, and there will then be every reason *not* to move forward with similar studies on human cells. If, however, the cell that results is pluripotent, and reliably so, then we will know, through an experimental finding that can be repeated by others, that there is no risk of embryo formation and that the procedure may be tried on human cells, in carefully controlled studies, to see if it produces similar results.

In his reply to me, Walker never mentions that the advocates of ANT-OAR are asking only for animal studies. The point is simply ignored. As the original statement put it: "Our proposal is for initial research using only nonhuman animal cells. If, but only if, such research establishes beyond a reasonable doubt that oocyte-assisted reprogramming can reliably be used to produce pluripotent stem cells without creating embryos, would we support research on human cells."<sup>10</sup> Why is Walker unwilling to acknowledge this? I would suggest that it is because he is employing a rhetorical strategy to bolster his own position. Convinced on intuitive grounds that he is right, he wants to paint the defenders of ANT-OAR as morally irresponsible. Supporters of OAR, the implication goes, are willing to risk the destruction of human beings in their headlong pursuit of pluripotent stem cells.

### **The "Conceptual Flaw" in All ANT-OAR Research**

But let us get to the meat of Walker's objection. He insists that any experimental research on OAR is unnecessary, because he has spotted a "conceptual flaw inherent in OAR and, indeed, in every conceivable form of ANT."<sup>11</sup> Notice that he says that *no experimental result* will ever prove him wrong. That is a remarkable claim. From his point of view, the case has already been decided prior to any actual research. This is what I mean by a priori commitments. No studies on animals have yet been done, and there is no purpose in doing them, Walker claims, because he already knows that they will fail. They will inevitably produce a totipotent and not a pluripotent cell.

The "conceptual flaw" in all ANT-OAR research, Walker goes on to say, vitiates "radically and *a priori* its usefulness as a method of obtaining embryonic stem cells."<sup>12</sup> He himself here explicitly states that his argument is decided on "a priori" grounds, that is, independent of any experimental data. How he is able to deduce this knowledge is unclear to me, but as I said in my previous editorial, a priori arguments are contrary to the best philosophical traditions of the Catholic Church. Our faith has always admired the workings of reason. Our faith has always been open to progress in the sciences. We cannot know anything about the created order unless our knowledge derives from experience. The editors of *Communio* appear to be followers of Immanuel Kant's transcendental idealism.

But Walker also claims that I, too, argue on a priori grounds. He cites my objection to William Hurlbut's original proposal to suppress the *Cdx2* gene "prior to

---

<sup>10</sup> Joint Statement with Signatories, "Production of Pluripotent Stem Cells by Oocyte-Assisted Reprogramming," *National Catholic Bioethics Quarterly* 5.3 (Autumn 2005): 579–583.

<sup>11</sup> "Real Aristotelians?" 785.

<sup>12</sup> *Ibid.*, 790.

any experimental testing of it.”<sup>13</sup> This is simply false. Hurlbut’s proposal followed the publication of research showing that the suppression of this particular gene prevents trophoblast formation in the embryo.<sup>14</sup> I hope Walker did not think I meant that I had to be present in the laboratory to personally confirm the experimental findings. I assume the scientific papers published on this topic are reliable (although the recent cloning fraud signals caution). What I objected to in Hurlbut’s original proposal was the suppression of *Cdx2* after embryo formation. In my opinion, the original ANT proposal would have given us an embryo with an engineered defect. Hence, the proposal was morally flawed. There was nothing a priori about my conclusion. It was founded on the data.

My steadfast principle has been that there must be no embryo from the very beginning of the process of altered nuclear transfer. Since those early discussions, however, further experimental findings have caused me, and other supporters of the original ANT-OAR proposal, to reassess our earlier opposition to Hurlbut’s *Cdx2* proposal.<sup>15</sup> The new studies indicate that *Cdx2* is expressed much sooner than was previously thought, meaning that it may indeed be possible to manipulate its expression prior to the fusion of the altered nucleus with an oocyte. If this is true, then Hurlbut’s proposal, when modified to take into account the previous moral objections, may very well give us pluripotent stem cells from the start.

But let us return to the details of Walker’s argument. He essentially says that this proposal, even if it were successful, would too closely mimic human conception. That is his central objection. Of course, one thing can mimic another without actually becoming that other. The question here is not whether ANT-OAR mimics conception or human cloning, or even whether what it produces mimics a human embryo. What matters in this experiment is whether what one produces is actually a human embryo.

Walker admits that the end product of ANT-OAR may not be a human embryo at all, but a pluripotent stem cell; however, his concern is with the beginning of the process. Here is Walker’s central complaint:

All possible forms of ANT share one thing in common, namely, they are all predicated on replicating the natural starting point of the process leading to pluripotent stem cells through nuclear transfer. It is just here that ANT’s problems begin, though, for the natural starting point of the process leading to stem cells is what it is only because it is first and foremost (logically, if not chronologically) the natural starting point of a human life.<sup>16</sup>

---

<sup>13</sup> Ibid., 789.

<sup>14</sup> See William B. Hurlbut, M.D., “Altered Nuclear Transfer as a Morally Acceptable Means for the Procurement of Human Embryonic Stem Cells,” *National Catholic Bioethics Quarterly* 5.1 (Spring 2005): 145–151.

<sup>15</sup> Kaushik Deb et al., “*Cdx2* Gene Expression and Trophectoderm Lineage Specification in Mouse Embryos,” *Science* 311.5763 (February 17, 2006): 992–996.

<sup>16</sup> “Real Aristotelians?” 791. Similarly, Walker states: “The biochemical modifications that are part and parcel of OAR aim at changing the outcome of the epigenetic repro-

Thus, if we picture the process of ANT-OAR as a movement from point A to point B, where A is the initial fusion and B the resulting pluripotent stem cell, we find that point A is still too much like a human embryo. Indeed, Walker claims, without any experimental data, that point A will be a human embryo. Again, how he knows this is unclear. No studies have yet been done on this particular method.

More to the point, Walker's statement displays a misunderstanding. He does not grasp what the scientific community is now able to do. ANT-OAR makes a change prior to point A, so that the process does not start at A at all, as Walker supposes, but actually starts at Z, a point *prior* to both points A and B. Given that earlier starting point Z, the process then moves directly to B, skipping point A. So it never passes through an embryonic stage. (Again, this is the theory—the tests have not yet been done.) How would this happen? Very simply. The alteration of the nucleus would occur *prior* to fusion; hence, there would already have been a change in the nature of the nucleus before it was joined with the enucleated egg, so that the product of the fusion could not possibly become a human embryo.<sup>17</sup> This is not a difficult point to see, but let me try to illustrate it more clearly.

Walker does not see (or seeing, does not understand) that the researcher will be able to determine what level of change he has induced in the nucleus *prior to fusion*. If the level of alteration is not sufficient to ensure a pluripotent stem cell, the researcher can further increase the needed transcription factors (or combine this increase with other changes) to gain the desired effect. He will be able to look at the present state of the nucleus and know whether, when it is fused to the ovum, it will give rise to a pluripotent stem cell. The studies on animal cells, such as primates, will enable him to know this ahead of time. Hence, the result of ANT-OAR will never be a human embryo, but always a pluripotent stem cell.

Walker's error is obvious in the following comment:

The problem with this description of OAR, however, is that it overlooks the fact that the active expression of the pluripotency-related gene in question depends on the fusion of the cellular materials that occurs within an overall developmental pattern of fusion, formation of a new cell, and initiation of the epigenetic reprogramming—and not vice versa.<sup>18</sup>

This is not correct. The active expression of the pluripotency-related gene does not depend on fusion, but is already expressed *prior* to fusion. That is the whole point of ANT-OAR. Thanks to the studies on animals, the researcher will know what the result will be before he begins. Walker's error is an error of fact.

---

gramming process. They do not change the logical sequence of events inherited from SCNT that goes from fusion of the cellular materials to the creation of a new cell to the initiation of epigenetic reprogramming" (789).

<sup>17</sup> Swetland and Saunders describe the importance of this point: "Because the soul is the form of the human body and the body expresses the soul, it is reasonable to assume that nothing other than a cell with the required epigenetic primordia is capable of receiving a human substantial form, i.e., a soul" ("Response to Criticisms," 744–752).

<sup>18</sup> "Real Aristotelians?" 791–792.

Why has Walker made this error? He has erred about a matter of fact because he thinks that we can decide such matters apart from any experimental findings. He is committed, as he himself says, to an a priori method that need not concern itself with experimental findings, which he can supposedly use, without scientific inquiry, to arrive at a knowledge of how ANT-OAR functions.

### **The Real Aristotelians**

I am not entirely certain why Walker titles his response to me, “Who Are the Real Aristotelians?” Perhaps the implication is that he is a real Aristotelian and I am not. That may be a good rhetorical argument, but I am certain that no Aristotelian ever argues his case on a priori grounds. Plato, yes; Aristotle, no. Aristotle was an observer of nature, and he deduced all of his conclusions about the metaphysical order of reality from experience. Yes, there certainly are “trans-empirical natures” that display themselves empirically through the properties they possess.<sup>19</sup> A thing is as it acts. Hence, it is possible for scientists to discriminate between an embryo and a stem cell through empirical inquiry. The former has the property of totipotency; the latter has the property of pluripotency. Natures are not exhausted by their empirical descriptions, but they are identifiable through those descriptions.

We need to do experiments on animal cells in order to determine whether what is produced by these new and promising methods will give us an embryo or a stem cell. We should not pre-judge the proposal on the basis of a priori premises that are not open to refutation. The defenders of ANT-OAR offer their proposal as a testable hypothesis. It is regrettable that opponents raise objections that are in principle beyond criticism and not subject to any objective test.

### **Schindler on Mystery**

David Schindler’s opposition to ANT-OAR also continues to rest on a priori premises. He invokes the idea of “ontological mystery.” Mystery, he says, “is woven into the fabric of organic reality, into the very nature of an organism. Mystery expresses the non-deterministic (not exhaustively mechanical) being and causal agency proper to an organism.”<sup>20</sup> If Schindler means by this that the nature of a thing cannot be reduced to its empirical or mechanical description, then we are in complete agreement. The universe is not a machine, but a teleological system. Schindler thinks his opponents are “mechanists,” even though almost every bioethicist trained in a religious tradition rejects mechanism as an explanation of nature. The whole point of OAR, after all, is to produce an organism that does not have the *teleological* potential of an embryo.

---

<sup>19</sup> Ibid., 792.

<sup>20</sup> Schindler contrasts the “ontological mystery” to “ANT’s appeal (in any of its current forms) to ‘systems biology,’ and again its distinction between active potency and passive potency, [which] fail to take adequate account of the all-at-once wholeness proper to an organism and, consequently, of the implications of this all-at-once wholeness for the causal agency constitutive of an organism. Because of such failures, ANT remains within a mechanistic horizon, despite its intentions to the contrary.” “*Veritatis Splendor* and the Foundations of Bioethics: Notes toward an Assessment of Altered Nuclear Transfer and Embryonic (Pluripotent) Stem Cell Research,” *Communio* 32.1 (Spring 2005): 197.



Schindler does not seem to understand the present state of the science:

The point is that there is a principled distinction to be made between experiments involving human-organic life in its initial and most subtle and fragile parts—e.g., pluripotent stem cells—and those experiments involving human-organic life in its already (more) maturely formed parts—e.g., adult stem cells, organ transplants, etc. In the latter cases, nature herself has already provided relatively complete and stable forms, and any (human-mechanical) intervention can therefore, *eo ipso*, work in a more profound way *with* nature, with what nature has already provided in and through her own organic environment.<sup>21</sup>

The distinction here is not strictly correct. There are cases in which more fully formed cells, which are not adult stem cells, remain pluripotent.<sup>22</sup> These “in-between” cases are the most interesting and promising avenues of research. The ANT-OAR proposal is an effort to produce just such a cell, one that has a certain measure of maturity to it from the very beginning, and that is therefore not an embryo, but a pluripotent stem cell.

But Schindler’s primary concerns do not matters of fact, but principles of metaphysics. In his latest paper, Schindler cites two major difficulties with OAR. “First of all, the principle that ANT offers for distinguishing a human organism from a sub-human entity ... yields no criterion adequate for sustaining such a distinction.”<sup>23</sup> But this is plainly false, as has been pointed out.<sup>24</sup> The criterion for distinguishing between an embryo and a pluripotent stem cell will be whether that cell is totipotent or pluripotent. If it is totipotent, it will be an embryo; if it is pluripotent it will be a stem cell. We will be able to tell whether this method is successful by performing studies on animal cells before even considering the use of human cells.

Schindler continues: “Secondly, ANT provides no principled criterion for noticing the *intrinsic* limits imposed by *nature herself* on experimental knowledge—i.e., on the manipulation of pluripotent stem cells—and the (potentially) serious implications of such intrinsic limits.”<sup>25</sup> The meaning of this comment is not immediately

---

<sup>21</sup> Ibid., 199.

<sup>22</sup> Kaomei Guan et al., “Pluripotency of Spermatogonial Stem Cells from Adult Mouse Testis,” *Nature* 440.7088 (April 27, 2006): 1199–1203. A company in Irving, California, recently announced that, using this technique, it has produced the “first human adult stem cell showing ability to differentiate into any cell in the body.” They note that this discovery “paves [the] way for cellular replacement therapies to cure a multitude of diseases” and that it “does not require generation or destruction of an embryo.” Prime Gen press release (March 27, 2006), <http://www.primegenbiotech.com/news/PrimeGenPR003.pdf>.

<sup>23</sup> “*Veritatis Splendor* and the Foundations of Bioethics,” 198.

<sup>24</sup> “The editors of *Communio* say that if animal studies proceed, we will learn nothing of importance. But I can tell you exactly what we will learn—and it will be vitally important. We will learn whether the entity that results from OAR is pluripotent or totipotent. If it is pluripotent, then we will have solved one of the major moral quandaries of our time and advanced the cause of regenerative medicine. If it is totipotent, then studies on human cells must not proceed. Let us see what the studies tell us about this question, and then invoke ‘ontology.’” Furton, “Defense of Oocyte-Assisted Reprogramming,” 468.

<sup>25</sup> “*Veritatis Splendor* and the Foundations of Bioethics,” 198–199 (original emphasis).

clear, but can be deciphered if we return to an earlier article by Schindler.<sup>26</sup> The scientific community suffers, Schindler says there, from a blindness to nature that may lead it to inflict serious harms upon society, including the possible production of “human monsters.”<sup>27</sup> Schindler’s concern is that the scientific community does not know what it is doing and cannot be trusted to carry out its aims without causing disaster. Nature has hidden well-springs beyond our ken, which when disturbed may become a potent source of evil, both physical and moral.

All of this is true. A typically trained scientist today believes that he possesses the only proper avenue to knowledge, and that through the skillful application of his methods he can arrive at an exhaustive description of the whole of nature. Such exaggerated claims have been made by scientists since the materialist Lucretius wrote his poem *On Nature*. Max Planck, who made such important strides in the field of electromagnetism, was once famously told not to go into physics, because nearly all the important problems had already been solved. It was just a matter of “rounding off the answers to the nearest decimal.” But that was before Einstein. The scientific community does indeed have a grossly exaggerated faith in its own methods and can be blind to the mystery of nature. Schindler rightly points out that because nature cannot be reduced to its empirical and mechanical descriptions, it will never be completely manipulable by the scientist. Some deeper part will always escape our knowledge.

There is nothing here to excite opposition. The question is how to make progress in resolving Schindler’s concerns. He appears to want a type of knowledge that no one but God could possess: an intrinsic metaphysical understanding of all the intricacies of nature. Perhaps that is his point, but if so, it is a counsel of despair, for the production of the very “monsters” that he fears can only be avoided if we enact laws that will protect embryonic life from its earliest beginnings. That is why we proposed OAR and why pro-life leaders should support S. 2754. We need to discover ways to obtain pluripotent stem cells without destroying embryos.

### **We Need a Way Forward**

Those concerned about what will result from ANT-OAR can be sure that if the initial experiments produce an animal embryo, rather than a pluripotent stem cell, all the signatories to the ANT-OAR proposal will abandon it. If, as we hope, a pluripotent stem cell is the result, then we will have the means of resolving one of the more intractable debates in bioethics. The way forward on regenerative medicine will be clear. Scientists will be able to receive federal funding for this important work while we who work to protect human life will have begun to curb the reprehensible practice of destroying human embryos for research purposes. We need to work together in this effort.

---

<sup>26</sup> David Schindler, “Biotechnology and the Givenness of the Good,” *Communio* 31.4 (Winter 2004): 612–644.

<sup>27</sup> *Ibid.*, 637.