Does Science Need Ethics?

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[ABSTRACT] This paper addresses two main challenges of the place of ethics in science. The first deals with the problems associated with a postmodern attitude toward science. In spite of the vertiginous advances of science and technology in our globalized world, there is a sense of unease in our relationship to them. We will examine the causes behind this unease by looking at the historical and philosophical roots of scientism, technological will to power, transhumanism and moral relativism. Scientism and nihilism which negates the needs of ethics as an independent audit of the scientific enterprise can pose a great threat to humanity. The second challenge concerns what kind of ethics should guide science. Here, the debates revolve around whether there are any universally accepted ethical approaches to science, and the role of religion in these methods. Postmodernity negates the possibility of a contribution from a religious ethics since they claim it is not empirical and therefore irrelevant. As a response, a critique is offered from the natural law perspective and recent writings of Pope Benedict XVI on the proper relationship between science and ethics, faith and reason.

Introduction

At first, it seems like an odd question to ask if science needs ethics. It is evident that science and scientists need to be ethical in their research and endeavors. One only needs to recall the haunting images of the atomic explosions over Japan and those of Nazi doctors experimenting on their prisoners in concentration camps to think otherwise. However, there are frequent conflicts between the claims of science and that of ethics. This paper will address two of the claims that science should be an independent discipline, and that ethical limits does not apply to science because that would slow down its progress.

The first claim comes from a belief that science and technology alone can resolve all human questions and problems without any outside help. This paper will trace the historical and philosophical roots of this movement called scientism which exalts science to such an extent that any critiques aimed at it or limits placed upon it would be considered untenable. This ideology is supported by the increasing role of technology in our society, where objective truth becomes subjugated to the whims of those who have the power to impose their desires on reality. This was already predicted by philosopher Nietzsche as nihilism, which he characterized with "the will to power," the creation of supermen and moral relativism. While science and technology can certainly offer many important advantages to improve our lives, if it ignores ethical implications it could also become a tyrant.

The second claim concerns what kind of ethics should guide science. Here, the debates revolve around whether there are any universally accepted ethical approaches to science, and the role of religion in these methods. Both the aforementioned scientism and nihilism negate the possibility of a contribution from a religious

ethics since they claim it is not empirical and therefore irrelevant for our postmodern needs. This paper will look at the question of the conflicts between reason and faith, and in particular the tension between rationalistic philosophical-based ethics and religious faith-inspired ethics.

As a response to these challenges, we will look at the Catholic approach to ethics based on the natural law perspective and some recent writings of Pope Benedict XVI on the proper relationship between science and ethics, faith and reason.

Science and Reason Alone Can Solve all Ills

Certain currents of thought today question the need of ethics in science. The first of this is termed scientism, also known as scientific or logical positivism. This is the product of the Enlightenment that enthrones science and reason to be a new goddess. First conceived of by the philosopher Auguste Comte (1798–1857), he envisioned three stages of progress in human knowledge: theological, metaphysics, and positivist. The theological stage is marked by medieval beliefs in the forces of the gods and spirits. This was replaced by metaphysics during the scientific revolution which attempted to explain causes in terms of invisible forces. In the positive stage, the purest form of human knowledge is attained by measurable and verifiable data of science. The most evolved stage of scientific positivism manifestly makes the claim: "Only that which is observable is true." Accordingly, metaphysical and religious truths are dubious since they cannot be scientifically demonstrated. Comte sees this evolution of knowledge in science and in society based on evolutionary theories in vogue at the time. Scientific positivism is reductive by nature, presuming a romantic but unproven view of history as

unidirectional and progressive. Its corollary in science is the belief that all scientific and technological advances and discoveries are necessarily positive and constructive.[1]

According to this view, only science can save humanity from misery. Therefore, society should not put any limits or prohibitions on scientific endeavors, including ethical ones. Thus, it is not uncommon to hear some scientists decrying government or churches when they voice concern on types of research. This has sometimes been coined as the scientific or technological imperative, where science trumps all other concerns. Recently, when some scientists discovered a way to create a deadly flu virus that could kill millions, the US government asked the journal not to publish the details of how this is done to protect against potential terrorism. Yet, some scientists felt that this was an infringement on scientific freedom and in the end, the publication went ahead.[2] A recent article on the questions of ethics in science wonders whether the public should have any say on the work of scientists. If anything, this confirms the general attitude that scientists should have absolute independence and not much accountability towards society.[3]

Scientists sometimes impose their desire by manipulating the message in such a way that their wishes are granted. For instance, most serious scientists know that embryonic stem cell research will not yield likely cures to diseases like Alzheimer's. Yet, there is so

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[1] See "Scientific Progress", Stanford Encyclopedia of Philosophy (October 1, 2002), in <http://plato.stanford.edu/entries/scientific-progress/>

[2] Alexandra Velcelean, "Dutch Researcher Created A Super-Influenza Virus With The Potential To Kill Millions," in Medical News, (November 28, 2011) <http://www.doctortipster.com/6952-dutch-researcher-created-a-super-influenza-virus-with-the-potential-to-kill-millions.html>

[3] Janet D. Stemwedel, "Who matters (or should) when scientists engage in ethical decision-making?" in Scientific American, (April 23, 2012) <http://blogs.scientificamerican.com/doing-good-science/2012/04/23/who-matters-or-should-when-scientists-engage-in-ethical-decision-making/>

much hype in the media that is not corrected by the scientific community that one wonders if they allow this misinformation on purpose in order to have a free hand in their research.[4] Sociologist John Evans has shown how scientists have influenced secular ethicists by forming an implicit alliance with those who in turn give the official nod to their undertakings. Citing a study of the history of the debates over the public control of science in the first thirty years of the Human Genetic Engineering debate, he concludes:

> "During this period in which the democratic approach to decision-making appeared to be gaining acceptance and impact, the political challenge it represented was successfully contained [by scientists], to such an extent that the technocratic approach—and the process of decision-making by elites that lies behind it—was never seriously threatened."[5]

If it is true that the only sure source of knowledge comes from what is empirically proven, then what cannot be thus demonstrated does not exist. Hence, any consideration that includes the existence of God, souls, human nature, and even such experiences as love, friendship, or courage will be eliminated in this equation. The ethical questions are therefore either irrelevant, or must be under the domain of science. That is, scientists can arrive at ethical decisions by using scientific methods like surveys. This is logically inconsistent as some philosophers have demonstrated. G.E. Moore calls this the *naturalistic fallacy* and David Hume calls this the *is-ought* problem. In essence, they complain that it is not valid to derive normative

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[4] Sherif Girgis, "Stem Cells: The Scientists Knew They were Lying?" in *Public Discourse*, (April 13, 2011) <http://www.thepublicdiscourse.com/2011/04/2490>

[5] John H. Evans, *Playing God*, *Human Genetic Engineering and the Rationalization of Public Bioethical Debat*e, (Chicago University of Chicago Press, 2002), 82, citing D. Dickson, *The New Politics of Science* (New York: Pantheon Books, 1984), p. 220.

ethical statements (what *ought* to be) from descriptive empirical facts (about what *is*). Science can tell us what is, not what we ought to do. As *Donum Vitae* insists, "What is technically possible is not for that very reason morally admissible."[6] Pope Benedict XVI in his Regensburg address critiqued this position:

> "This gives rise to two principles which are crucial for the issue we have raised. First, only the kind of certainty resulting from the interplay of mathematical and empirical elements can be considered scientific. Anything that would claim to be science must be measured against this criterion. Hence the human sciences, such as history, psychology, sociology and philosophy, attempt to conform themselves to this canon of scientificity. A second point, which is important for our reflections, is that by its very nature this method excludes the question of God, making it appear an unscientific or pre-scientific question. Consequently, we are faced with a reduction of the radius of science and reason, one which needs to be questioned."[7]

The Technological Revolution

The ideology of scientism has taken hold because technology has taken tremendous strides since the industrial revolution, resulting in many positive improvements for humanity. We live longer,

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[6] Congregation for the Doctrine of the Faith, *Donum Vitae—Instruction on respect for human life in its origin and on the dignity of procreation*, 1987, 4.

[7] Benedict XVI, *Address at University of Regensburg*, (September 12, 2006), <http://www.zenit.org/article-16955?l=english>

healthier, and more comfortable lives than our ancestors. Medicine has undergone a breathtaking transformation in the recent past. The end of the 19th century saw the beginning of anesthesia, antiseptic practices and X-Rays. We tend to forget that scientists discovered the first effective antibiotics only during the Second World War. After that, medical science exploded with an armamentarium of life-saving procedures—blood grouping, open heart surgery, mechanical ventilation, dialysis, organ transplants, and chemotherapy, to name a handful. Throughout most of human history, death came at an early age—typically one lived only 25–35 years. Over the past century, however, life expectancy has risen to around 77 years—tripling the life span of our ancestors.

Science and technology has indeed eliminated many miseries and discomforts. Thanks to technical advances, we have higher standard of living, travel with relative ease, and can communicate with family or friends on the other side of the globe instantly. Most of us cannot live without these modern comforts—just imagine living without electricity or hot showers. At the same time, we are plagued by the fact that technology can sometimes harm us. There is a sense that technology can also harm us.

This ambivalent attitude towards technology is evident in many areas today. Industrialization has undoubtedly improved the quality of life, but we are just beginning to recognize many ecological disasters that came with it. The nightmare of Chernobyl, acid rain from electric plants, air pollution from automobiles, oil spillage and water pollution, ozone depletion, animal extinction, the problem with waste disposal and climate change are just some examples.[8] While genetically modified foods promise to alleviate world hunger, there

[8] See Paul Haffner, *Towards a Theology of the Environment* (Leominster: Gracewing, 2008).

are those who are worried of "Frankenfood" and the seeds that will destroy the natural food chain.[9] Information technology has changed the way we relate to each other in the spheres of social relationships, education and research, commerce and politics, religion and culture. At the same time, the negative impact of cybernetics is just around the corner—online gambling, pornography and even child porn, plagiarism and illegal trading, invasion of privacy, spam and virus attacks are prominent examples.[10] One must not forget that many innovations, including internet, GPS and innovative surgical techniques were ironically spin-offs from military technology. The ambivalent attitude toward technology is most acute in medicine because it affects us more deeply than other advances, promising cures and extending lives. Lifesaving techniques make it possible to resuscitate biological life, but at the expense of unconscious existence sustained by inhuman machines. Unprecedented choices have fostered false hopes that medicine can do the impossible, not only radically reduce human suffering, but enhance human performance and make allowance for new and better lifestyles.[11]

Yet, we feel helpless without technology, and there seem to be no turning back to an age without cell phones, internet or organ transplants. Will science and technology save or destroy humanity?

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[9] See for example, F. William Engdahl, *Seeds of Destruction: The Hidden Agenda of Genetic Manipulation* (Montreal: Global Research, 2007).

[10] See for example, the recent UK report on the problem of pornography for the underage in *Independent Parliamentary inquiry into online child protection: findings and recommendations*, (April 2012) <http://www.claireperry.org.uk/downloads/independent-parliamentary-inquiry-into-online-child-protection.pdf >

[11] See Daniel Callahan, *Setting Limits: Medical Goals in Aging Society* (Washington DC: Georgetown University Press, 1987); Id., *False hopes: Overcoming the Obstacles to a Sustainable, Affordable Medicine* (New Brunswick, NJ: Rutgers University Press, 1999).

We see this ambivalence toward technology from this passage of John Paul II in *Redemptor Hominis*:

> "The man of today seems ever to be under threat from what he produces, that is to say from the result of the work of his hands and, even more so, of the work of his intellect and the tendencies of his will. . . Man therefore lives increasingly in fear. He is afraid that what he produces—not all of it, of course, or even most of it, but part of it and precisely that part that contains a special share of his genius and initiative—can radically turn against himself; he is afraid that it can become the means and instrument for an unimaginable self-destruction, compared with which all the cataclysms and catastrophes of history known to us seem to fade away."[12]

Where does ethics fit into all this? To answer this question, we need to examine the history of technology and our troubled relationship with it. During modernity and the industrial revolution, there was a buoyant optimism that a new humanity could finally triumph over nature by means of science. Francis Bacon's dictum "Knowledge is power" became the banner of the insatiable search for improvement. This positivistic vision makes the question of direction—what are our goals, why we want to go there, and what is the best way to get there—irrelevant or impossible. Later on, evolutionary theories applied this concept of malleable nature to humans themselves. The next few centuries saw a vertigo-inducing metamorphosis of the world. These advances allow modern man to program the future with technical precision in almost every aspect of

[12] John Paul II, Encyclical *Redemptor Hominis* (March 4, 1979), n. 15.

his economic, political and aesthetical life. Even health, sickness and death become organized. This new technological culture receives a quasi-religious significance, providing a sense of security that replaces the traditional need for a providential God. Technologized societies must operate according to values such as efficiency, programming and power. However, organization and planning cannot fill the place of ethics.[13]

At the same time, modern man is in anguish because it is not able to find any firm point of reference. When modernity denies traditional forms authority, everything including power is up for grabs. The technical culture of constant movement and renewal cannot satisfy the human spirit. Since nature has become an unknown, chaotic and uncertain force, humans are now engaged in a game of power struggle—imposing force on culture, nature and on each other—in order to survive. Risky behaviors are a part of this gamble, since technology has made the world impersonal and cold. In this scenario, where individuals can exercise power without personal responsibilities, the tragic consequences of the World War II ensued.[14] The atom bomb, "an invention to end all inventions," has gravely shaken our confidence in the saving powers of science and reason.

It is as if technology has taken on a life of its own, something we can no longer dominate but has the potential to destroy everything we hold dear. The catastrophic events of World War II greatly influenced the philosopher Hans Jonas, who called for responsible ethics in this era of high technology. Traditional ethics is no longer

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[13] See Romano Guardini, *Power and Responsibility: a Course of Action for the New Age* (Chicago: Henry Regnery Co., 1961).

[14] See Romano Guardini, *The End of the Modern World* (London: *SHEED & WARD*, 1957).

sufficient. We need to consider the accumulative effects of human impact on the world. Jonas proposes an "imaginative heuristic of fear" as the guiding principle which anticipates the issues in balance and their attendant perils. This precautionary ethical approach to foresee all possible ill-effects on future generations and humanity is urgent since the velocity of technological advances makes it difficult to exercise restraint. Against the temptation of "Promethean immodesty," Jonas calls for a "power over power" by seeking political and structural responsibility to safeguard the future of humanity.[15]

Another German philosopher, Martin Heidegger, offers a contrasting reflection. Even though his philosophy is not an easy read, his *Question Concerning Technology* provides a thought-provoking analysis to this postmodern dilemma.[16] *Techne* in its original etymological sense is related to *poiesis* because they are both productive. The latter arises from an instinctive awe with nature producing or bringing forth the arts and poetry. Originally, *techne* conceals and reveals to humanity something about Being, nature and truth. Modern technology, however, has changed this relationship with nature. We no longer cooperate with or learn from nature but challenge, assault and exploit it for our own benefit. Nevertheless, technology still has the ability to reveal and bring forth the truths of nature and our destiny. This is more difficult since our contact with nature is no longer immediate but mediated by many unknown steps when we tap into its powers. Thus, the technology of our age is ambiguous: it could be either "supreme danger" or "saving power."

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[15] See Hans Jonas, *The Imperative of Responsibility. In Search of Ethics for the Technological Age* (Chicago / London: Chicago University Press, 1984).

[16] See Martin Heidegger, "The Question Concerning Technology," in *Basic Writings*, ed. David Krell (New York: HarperCollins, 1993).

Heidegger uses the German word *Gestell*, which literally means "en-framing," to describe our present-day predicament. By this, he wishes to convey the disquieting reality that this all-encompassing framework traps the postmodern society—technology is no longer a means to an end but a mode of human existence: "Thus we shall never experience our relationship to the essence of technology so long as we merely conceive and push forward the technological, put up with it, or evade it. Everywhere we remain unfree and chained to technology, whether we passionately affirm or deny it." [17] Technology has become absolute. While we may still live with the illusion that they are only instruments, we are in fact their slaves. It is no longer neutral but invades every aspect of our globalized world. In this *Gestell*, every solution we seek to resolve problems created by technology is itself technological. This serves only to reaffirm the prison we are in.

Perhaps the difference in approach between these two contemporary authors Jonas and Heidegger is indicative of the postmodern uncertainty regarding the role of technology. Hiroshima and Auschwitz make the need for ethical responsibility ever more urgent. Jonas approached the urgency with a proposal of increased awareness and collective duty. Heidegger, however, is silent on this subject, probably because he sees no solution in this *Gestell* since ethics implies the ability to free oneself of this technological prison in order to choose the right course of action from an outsider perspective. His existential and individualistic philosophy would not permit him such a project. Heidegger, realizing the impossibility of such a task, hinted with a note of irony that only a "god" could provide us with such an external perspective.

[17] See Martin Heidegger, "The Question Concerning Technology", p. 287.

From the Will to Power to Transhumanism

Today's dilemma concerning technology is also caused by an increased awareness of human freedom. Since the time of the Enlightenment, freedom has taken on greater significance in society, but with a heavy emphasis on individual choices and rights. Autonomy, privacy and self-determination are the hallmarks of modern liberal societies. As technology joins forces with liberty, it is not difficult to understand why the public accepts the latest novelties from the high-tech market.

Friedrich Wilhelm Nietzsche (1844–1900) coined the famous dictum "the will to power" (*der Wille zur Macht*) commonly understood to mean that the new man must continually strive to achieve perfection. Since evolution and transformation are the principles of reality, the modern man must never be fixed on anything alleged to be true. Instead, he should move on to a higher plane. Will to power means that truth is the result of the will, deriving its power from superior forces and even violence. Certainly, the ideology of "might makes right" is found in political regimes as well as in religious fundamentalism. Less well known is its presence in scientific pursuits that seek to silence all dissensions. Carlo Caffarra summarizes this ideology in the case of reproductive technology, "the belief that subjective rights coincide with the desire of psycho-physical well-being: I have the right to what I desire. This identification of 'desire-right' is tied to the belief that 'what is technically possible must be allowed.'"[18]

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[18] "La convinzione secondo la quale il diritto in senso soggettivo coincide col desiderio del bene-essere psico-fisico: ciò che io desidero ho diritto ad avere. Questa identificazione "desiderio-diritto" si sposa ad un'altra convinzione, quella secondo la quale "ciò che è tecnicamente possibile deve essere consentito." Carlo Caffarra, "La procreazione artificiale: aspetti etici ed aspetti politici," Verona (8 February, 2003) <http://www.caffarra.it/verona03.php>

As we have noted already, technology and science allows us to explore the nature outside us, and the human nature within us. The news that we can clone animals made news in 1998, and attempts have since been made to clone humans, to create animal-human hybrids, and to proceed with synthetic biological life. Recent advances in the areas of genetic engineering, neuroscience, nanotechnology, and artificial intelligence are also on the horizon as means to cure diseases, prolong lifespan, and enhance the human race. Manipulation of nature, especially human nature at the beginning of life, the end of life, and the processes of human reproduction is the major concern of biomedical ethics. For instance, if an infertile couple "wills" to have a child and, if medical science unleashes this "power," then it seems reasonable for them to employ the latest reproductive know-how. Artificial reproductive technology has precisely moved along this logic from contraception to *in vitro* fertilization to eugenic measures through genetic screening and enhancement. Eugenics in its original sense means the promotion of good genes—now this can be done by screening either at the prenatal level (before the child is born) of at the preimplantational level (testing the genetic makeup embryos with PGD)—by eliminating the less than perfect embryos and implanting the desired ones. In these techniques, the scope is the same—creating an offspring with the best if not perfect genetic material. While prenatal diagnosis or PGD can eliminate the supposed "burden" of unhealthy offspring, they open the way to manufacture of "designer babies" and gender discrimination, a slippery slope toward the genetic discrimination of GATTACA.[19]

[19] See for instance, Gilbert C. Meilaender, *Body, Soul, and Bioethics*, (Notre Dame: University of Notre Dame Press, 1995): 61–88; Leon R. Kass, "Making Babies: The New Biology and the "Old' Morality", in Id., *Toward a More Natural Science: Biology and Human Affairs*, (New York: The Free Press, 1985), 43–79.

The science fiction film GATTACA portrays a futuristic struggle with biotechnology. The initial letters of the four DNA bases (Adenine, Cytosine, Guanine, and Thymine) forms the title of this cinematographic drama. In this society driven by liberal eugenics, there is a lot of pressure for parents to use preimplantation genetic diagnosis (PGD) to create children selectively with the best hereditary traits. In this way, society differentiated its members according to their genetic makeup which predicts their personality traits, physical prowess, disease risks and lifespan. Only those who have superior genomes and enhanced traits qualified for the best jobs, whereas the disease-prone and mentally inferior members were consigned to menial labor. The plot of this movie revolves around one of these inferiors who manages to beat the system by his ingenuity, hard work, sacrifice, courage, and indomitable spirit that are ironically missing in his genetically superior counterparts. The last scene is evocatively religious. The genetically defective protagonist manages to reach the heavens in a space shuttle. As the fire of the rocket blasted, the scene shifts to the fire of the furnace where his genetically perfect alias incinerates himself for failing to live up to his genetic destiny. Interestingly, afteranalyzing hundreds of films, NASA recently named this "the most plausible science fiction movie ever made."[20]

Leon Kass wonders aloud if we have purchased technical progress with the high price of our humanity:

> "[As] Aldous Huxley prophetically warned us, in his dystopian novel *Brave New World*, the unbridled yet well-meaning pursuit of the mastery of

[20] See Jarett Wieselman, "NASA picks the best & worst sci-fi movies," in *New York Post*, (January 06, 2011) http://www.nypost.com/p/blogs/popwrap/nasa_OI2DH3V3G5dBOdxlXj3MiI

> human nature and human troubles through technology can issue in a world peopled by creatures of human shape but of shrunken humanity—engaged in trivial pursuits; lacking science, art, religion, and self-government; missing love, friendship, or any true human attachments; and getting their jollies from high-tech amusements and a bottle of soma."[21]

In fact, this coupling of liberty (will) with technology (power) echoes the famous dictum "will to power" Nietzsche predicted would characterize our postmodern world. When liberty becomes absolute and technology unchecked, he predicted that a new human race of supermen (ÜBERMENSCH*)* would be the logical outcome. In science, we see the realization of this in transhumanism, where certain scientists and philosophers advocate the enhancement of the human species—both in mind and body—by employing any means at our disposal.

Transhumanism is the climax of this will to power as it proposes to overcome our present limitations and take control of our evolutionary future with the latest biotech innovations. Joseph Fletcher, one of the fathers of bioethics, was ahead of his time when, in the 1950s, he advocated the right to contraception and artificial insemination.[22] For the sake of perfecting the human race, he denied the personhood of defective infants and mentally handicapped, which he derogatorily considered as "idiots."[23] Following this logic, killing

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[21] Leon Kass, "Defending Human Dignity," in *Human Dignity and Bioethics*, Vv.Aa., (Washington DC: President's Council on Bioethics, 2008), 303; Aldous Huxley, *Brave new world* (New York Perennial Classic, 1998).

[22] See Joseph Fletcher, *Morals and Medicine* (Princeton: Princeton University Press, 1954).

[23] "Idiots. . . are not, never were, and never will be in any degree responsible. Idiots, that is to say, are not human. The problem they pose is not lack of sufficient mind, but of any mind at all. No matter how euphoric their behavior might be, they are outside

"idiots," as in the case of mentally of physically disabled neonates, is justified as "postnatal abortion." [24] The unrepentant Fletcher encourages quality control by genetic selection for intelligence and weaning out carriers of undesirable traits.[25] At one point, he echoes the Nazi's eugenics program by encouraging annihilation of genetically defective children by forced abortion: "It would be right either voluntarily or coercively to limit procreation by prevention either before or after conception—if and when specified genetic diseases or defects are predictable or at risk." [26] Fletcher is unhampered by any fixed notion of human nature, and would not be abashed at the possibility of reconstructing males so that they may give birth, or creating hybrids through coitus between humans and apes.[27] His utilitarian leanings led him to such outrageous proposals as reproductive cloning to produce an army of soldiers or workers, and creating transhumans:

> "If the greatest good of the greatest number (i.e. the social good) were served by it, it would be justifiable not only to specialize the capacities of people by cloning or by constructive genetic engineering, but also to bio-engineer or bio-design para-humans or "modified men" —as chimeras (part animal) or cyborg-androids (part prostheses). I would vote for cloning top-grade soldiers and scientists, or

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the pale of human integrity. Indeed, sustained and "plateau" euphoria is itself *prima facie* clinical evidence of mindlessness." Joseph Fletcher, *Humanhood: Essays in Biomedical Ethics* (Buffalo, NY: Prometheus Books, 1979), p. 22.

[24] See Joseph Fletcher, *Humanhood*, p. 140–148.

[25] See Joseph Fletcher, *The Ethics of Genetic Control: Ending Reproductive Roulette* (New York: Doubleday 1974).

[26] Joseph Fletcher, *Humanhood*, p. 119.

[27] See Wesley J. Smith, *Culture of Death: The Assault on Medical Ethics in America* (San Francisco Encounter Books, 2000), pp. 225–226.

> for supplying them through other genetic means, if they were needed to offset an elitist or tyrannical power plot by other cloners—a truly science-fiction situation, but imaginable. I suspect I would favor making and using man-machine hybrids rather than genetically designed people for dull, unrewarding or dangerous roles needed nonetheless for the community's welfare—perhaps the testing of suspected pollution areas or the investigation of threatening volcanoes or snow-slides."[28]

He is so optimistic in technological advances that no restriction must ever be placed on scientific research, none whatsoever! In this scheme of things, even the last liberal hurdle of individual autonomy and choice must be vaulted for the good of the society: "Testes and ovaries are social by nature and it would appear ethically that they should be controlled in the social interest."[29]

Apparently, when Fletcher wrote in the 1970s, his predictions about technology were imprecise. Modern day transhumanists are more sophisticated and advocate employing the latest gizmos to reengineer the human race. In some way, this is the logical conclusion to the train of thought developed above. *In vitro* fertilization provides the "raw material" of a large quantity of human embryos for commercialization, experimentation and selection. Stem cells and cloning jumped on to this bandwagon of regenerative medicine, which together with nanotechnology, cybernetics, and genetic engineering promise to cure the incurable and indefinitely prolong life. James Hughes, director of the World Transhumanist

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[28] J. Fletcher, *Humanhood*, p. 85.

[29] J. Fletcher, *Humanhood*, p. 118.

Association, argues that these technologies will radically enhance human lives and expand the boundaries of humanness. As an inevitable coda to evolution and scientific progress, modern democracies must make these technologies available to everyone.[30] In the words of Gregory Stock, "The next frontier is our own selves."[31] In the same vein, geneticist Lee Silver writes:

> "Why not seize this power? Why not control what has been left to chance in the past? Indeed, we control all other aspects of our children's lives and identities through powerful social and environmental influences and, in some cases, with the use of powerful drugs like Ritalin and Prozac. On what basis can we reject positive genetic influences on a person's essence when we accept the rights of parents to benefit their children in every other way?" [32]

Indeed, the biotech gamble has raised the stakes since it allows us to transform human nature itself. The transhumanist proposal to seize the power and take control of our evolutionary future can leave us either with Nietzsche's superman or the *Abolition of Man* predicted by C.S. Lewis. [33] The indiscriminant use of biotechnological powers has alarmed not only religious groups but also a number of secularists who worry about unchecked

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[30] See James H. Hughes, *Citizen Cyborg: Why Democratic Societies Must Respond to the Redesigned Human of the Future* (Cambridge, MA: Westview Press, 2004); Id., "Embracing Change with All Four Arms: A Post-Humanist Defense of Genetic Engineering", *Eubios Journal of Asian and International Bioethics* 6.4 (1996): pp. 94–101.

[31] See Gregory Stock, *Redesigning Humans: Choosing our Genes, Changing ourFuture* (Boston: Houghton Mifflin, 2003).

[32] Lee Silver, *Remaking Eden. Cloning and Beyond in a Brave New World* (New York: Avon, 1998), p. 277.

[33] See Friedrich Nietzsche, *Thus Spake Zarathustra: A Book for All and None*, (1891); C. S. Lewis, *The Abolition of Man*, 6th ed. (Glasgow: HarperCollins, 1986).

profit-driven interests, the effect of an unknown post-human future, and generational inequalities that would undermine the foundation of liberal democracies.[34]

Moral Relativism and the Denial of Universal Truth

As a sequel to the logic of the will to power which proposes the making of a superman in the transhumanist agenda, Nietzsche advances his belief that there is no objective truth found in nature, including human nature. Thus, moral relativism is inevitable. He states in *The Twilight of the Idols*:

> "One knows my demand upon the philosopher that they place themselves *beyond* good and evil—that they have the illusion of moral judgment *beneath* them. This demand follows from an insight first formulated by me: *that there are no moral facts whatever*. Moral judgement has this in common with religious judgement that it believes in realities which do not exist. Morality is merely an interpretation of certain phenomena, more precisely, a misinterpretation. Moral judgment belongs, as does religious judgement, to a level of ignorance at which the concept of the real, the distinction between the real and imaginary, is lacking: so that at such a level "truth" denotes nothing but things we today call "imaginings". To this extent moral judgments are therefore never to be taken

[34] See Jeremy Rifkin, *The Biotech Century,* (London: Penguin, 1998); Francis Fukuyama, *Our Posthuman future: Consequences of the Biotechnology Revolution* (New York: Picador, 2002); Jürgen Habermas, *The Future of Human Nature* (Cambridge: Polity, 2003).

> literally: as such it never contains anything but nonsense."[35]

For moral relativists, no universal standard exists by which the truth of an ethical proposition's can be assessed, but they are instead relative to social, cultural, historical or personal circumstances. According to Tristram Engelhardt, in the field of ethics, moral skepticism and relativism is rampant. Even though one might not agree with his understanding of the role of reason and natural law, he is prophetic in foretelling the moral skepticism of the day which denies or doubts the possibility of ascertaining moral knowledge or ethical truth.[36]

One form of moral skepticism is the neo-positive school of non-cognitivism and emotivism which holds that ethical statements (for example, 'Do not kill innocent persons') are not assertive propositions—that is, they do not express factual claims or beliefs and therefore are neither true nor false (i.e., they are not *truth-apt*)—but express only emotions (e.g., Killing is yucky). While non-cognitivists and emotivists do not negate the existence of moral truths, they maintain that it is not the function of ethical discourse to refer to such values. The real function of moral discourse is to express *feelings* of approval or disapproval, and to recommend similar *emotions* to other.[37] MacIntyre declares emotivism to be the unprofessed moral

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[35] Friedrich Nietzsche, *Twilight of the Idols* in Philip Novak (ed.), *The Vision of Nietzsche*, (Rockport, MA: Element Books, 1996 [1889]), p. 72.

[36] See H. Tristram Engelhardt, Jr., *Bioethics and Secular Humanism: the Search for a Common Morality* (London–Philadelphia: SCM Press—Trinity Press International, 1991), pp. 110–111.

[37] See Hans Reichenbach, *The Rise of Scientific Philosophy* (Berkeley University of California Press, 1951).

theory accepted today. It is very much "embodied in our culture" and is more common than we think.[38]

Moral skepticism, emotivism and relativism are cognates, all feeding into Nietzschean nihilism which is the philosophy asserting that right and wrong, good and evil do not exist. The average man on the street is not a philosopher who speculates on these matters. But in public behavior and lifestyle, many hold similar attitudes in a pragmatic rather than abstract way. In place of moral truths that are objective and obligatory for everyone, the current mentality seems to exalt personal choices and freedom. Freedom without truth means that what I desire and want becomes the measure of "my" truth and "my" morality. This is the common slogan of the pro-choice advocates and those who see no problems with same-sex marriages, transgender operations, etc, as long as the person wants it and is comfortable with his or her decision. Benedict XVI summarizes this disconcerting mindset in the Regensburg address:

> The subject then decides, on the basis of his experiences, what he considers tenable in matters of religion, and the subjective "conscience" becomes the sole arbiter of what is ethical. In this way, though, ethics and religion lose their power to create a community and become a completely personal matter. This is a dangerous state of affairs for humanity, as we see from the disturbing pathologies of religion and reason which necessarily erupt when reason is so reduced that questions of religion and ethics no longer concern it. Attempts to construct an ethic from the

[38] See Alasdair C. MacIntyre, *After Virtue* (London: Duckworth, 1984), p. 22.

> rules of evolution or from psychology and sociology, end up being simply inadequate.[39]

We have just taken a very look at the sociological and philosophical background as to why science has been put on a pedestal and is now almost immune to any external critiques. As a result, most people on the street have high regards for scientists and do not usually question their endeavors. This new clout gained by the scientific community makes it very difficult to question the motives and ethnicity of scientific research and development. To add to this, financial interests and political leverage makes it even harder to criticize them. Critics, religious or not are often labeled as luddites who are considered retrogrades, doomsayers and against the progress of humanity.

Which Ethics for Science?

We are also faced with the second challenge of finding an adequate ethic of science. Heated debates exist among ethicists about the existence of a common or universal ethics. There are some who outright reject the existence of a global ethics, while others accept it on a pragmatic level and yet there are those who enthusiastically embrace it. These positions will be briefly evaluated, leading to an examination of natural reason espoused by the Catholic tradition.

While modern philosophers launched the project of rationalism as the criterion of truth with heavy reliance on the scientific method, postmodernists are skeptical that truth is accessible by reason. Modern philosophers in a way dug their own grave when they limited their scope of truth to the realm of empirically verifiable data.

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[39] Benedict XVI, *Address at University of Regensburg*.

Empiricism shed great doubts on our ability to know realities beyond our senses, thereby challenging the metaphysical concepts of nature, causality and substance. German idealism delivered the *coup de grâce* because it further limited reason's grasp of reality outside of the self. This eventually provoked the final phase of postmodernism nihilism which rejects any truth-claims, any reference to objective values within reach of reason or faith.

In the field of medical ethics, there was a dire need in the 1970s to seriously address a number of critical issues brought on by technology and human experimentation. The *Belmont Report* (1978) emerged from an examination of principles and their application to guidelines for informed consent, risk-benefit assessment and selections of subjects. This was eventually proposed as a universally acceptable method available to all cultures and backgrounds. The four principles of biomedical ethics, autonomy, beneficence, non-maleficence, and justice, provided a theoretical framework for practical decision making. None was *a priori;* all were viewed as *prima facie* in application. In its latest edition, Beauchamp and Childress further elaborate a defense of this methodology which is founded on *prima facie* or self-evident principles. Beauchamp reiterates the case on the basis of a common morality that is binding on all humanity, irrespective of race and culture.[40] This is not to say that principlism in itself, rooted in secular liberal philosophy, is unproblematic from a Christian and natural law perspective. Above all, it tends to absolutize individual choices at the expense of other values, and falls into the emotivism that MacIntyre complains about.

[40] See Tom Beauchamp and James Childress, *Principles of Biomedical Ethics*, OUP, New York 1979; Tom Beauchamp, "Comparative Studies: Japan and America," in *Japanese and Western Bioethics: Studies in Moral Diversity*, ed. Kazumasa Hoshino (Dordrecht 7 Boston/ London: Kluwer Academic Publishers, 1997), 25–48.

Another pragmatic candidate to global ethics is the "overlapping consensus" of John Rawls. It can serve as the basis of common morality among different visions of the good in a society, by picking the lowest common denominator. Rawls recognizes the lack of broad agreement about what constitutes the good in modern democratic societies. A plurality of doctrines—religious, political or philosophical—raises the interrogative as to how society could reconcile these differences. He reformulates the possibility of "overlapping consensus" in public debates based on a political conception of justice. Overlapping consensus provides a core of moral standards that all reasonable individuals in a pluralistic society with different comprehensive conceptions of the good would support since it is largely uncontroversial. Overlapping consensus is the area of agreement, shared by all reasonable participants in this social contract.[41]

Another frequent appeal to global ethics is found in the language of human rights. After the tragic experience of the Second World War and the Nuremburg trials, many nations felt the need for a safeguard against future abuses and inhuman acts. Thus, in 1948 the United Nations signed the *Universal Declaration of Human Rights*. Its preamble says: "All human beings are born free and equal in dignity and rights." These rights are deemed basic to all humans and transcend all cultures and nationality. Since then, many other national and international documents have recourse to the language of human rights in the areas of politics, work, education, healthcare, and the environment.

A few years ago, some Asian leaders complained that human rights were a Western invention that were imposed on the rest of the

[41] See John Rawls, *Political Liberalism, The John Dewey Essays in Philosophy 4*, Columbia University Press, New York 1993.

world. There were other complaints that these declarations never explicitly define the meaning, content, and foundations of human rights. Mary Ann Glendon traces the development of the 1948 *Declaration* and shows that the signing nations looked for a political consensus rather than a moral or philosophical treatise on human nature.[42] In spite of this deficiency, nations affirmed human rights and dignity because man's inhumanity to man was fresh in their minds—the Holocaust, slavery, genocide, ethnic cleansings, political murders of dissidents in totalitarian regimes, religious coercion, human trafficking, torture and degradation of prisoners. It was through this *via negativa* that they affirmed the existence of universal human rights.[43] Even though many people uphold that some moral propositions such as "slavery is always wrong" can be universally held, they are unable to agree upon the rationale behind this. Can natural law rationality supply the missing foundation of human rights based on human dignity and natural rights? Before turning to this question, we will now address the question of religious input in general ethics.

There was a time when religious input was essential in any ethical consideration. However, with the rise of modernity and secular humanism, religion was considered sectarian and detrimental to the good of humanity. Since the times of the Enlightenment, traditional control of religion in vital spheres of the social order began to crumble under the secular challenge in the areas of politics, culture, science, economy, judiciary, philosophy, and education. Ethics and theology were probably the last strongholds until they

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[42] See Mary Ann Glendon, "Foundations of Human Rights: The Unfinished Business," *American Journal of Jurisprudence* 1 (1999): 1–14.

[43] See Joseph Tham, "Challenges to Human Dignity in the Ecology Movement," *Linacre Quarterly* 77, no. 1 (2010), 53–62.

eventually succumbed as well under the influence of the now secularized academia.

This is most evident in the budding field of bioethics which began in the 1960s due to a peculiar set of circumstances in the USA. Biomedical technology was developing at an unprecedented pace, and there was a need to make decisions on a slew of difficult issues. It was a time of cultural upheaval, when traditional ethical theories seemed inadequate. Bioethics was born as a response to address these complex issues, with an interdisciplinary approach involving philosophers, theologians, lawyers, doctors and policymakers. Obviously, medical ethics traces its origin to the Hippocratic Oath, with significant Christian input from moral theology and manuals as well as the code of ethics. However, even though a majority of the forerunners in bioethics had theological training, in the next few decades, a process of secularization took place.[44]

As a result, the religious voice has been marginalized and deemed inappropriate in the public debate on ethics and bioethics. This somewhat provocative (or humorous, depending on how seriously one takes it) posting on the internet is indicative of a general antagonism toward religious "intrusion" into ethical issues:

> "This blind acceptance of mixing ethics and medical science with religion is unacceptable, and has to stop. For centuries, societies have known better than to let religious influences interfere with democracy, due process, reason and scientific inquiry. The inalienable domains of biology and procreation should be regarded no differently than the social and

[44] See Joseph Tham, "The Secularization of Bioethics," *National Catholic Bioethics Quarterly* 8, no. 3 (2008): pp. 443–453; John Evans, *Playing God*?

> political arenas. Religious bioethics is full of inherent problems and inconsistencies. It's time to dismiss it and acknowledge the efficacy and validity of real and accountable secular bioethics. In biology as in politics, citizens have the right to be free from the pressures of organized religion."[45]

Other examples of discrimination against religious voices in public debates can be observed in the media treatment of cloning, stem cell research and end of life issues. In California, supporters of Proposition 71 avert that opposition to embryonic stem cell research "rests on religion attempting to block science and amounts to imposing religious views on public policy."[46] *Washington Monthly* accuses the religious right of promoting pseudo-science by its own experts.[47]

After the 9-11 tragedy, there were posters with this slogan: "Science will fly you to the moon. . . Religion will fly you into a building." Lately, there has been constant reminder in the media by different writers such as Richard Dawkins and Christopher Hutchins that science and religion, reason and faith are incompatible. Thus, the question of whether science needs ethics is complicated with the question of whether an ethics of science can be open to religious input. The question is increasingly urgent as the technological imperative becomes widespread. Stanley Jaki adverts:

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[45] G. Dvorsky, "Canada: The Separation of Church and Bioethics: Our Physical Bodies should be as Free from Religious Interference as Our Political Bodies", in <http://www.sentientdevelopments.com/2006/03/separation-of-church-and-bioethics.html>

[46] Anonymous, "Stem-cell dispute not *reason versus ignorance*, theologian says", *Catholic News Service* (Oct. 19, 2004). <www.catholicnews.com/data/stories/cns/0405767.htm>

[47] See Chris Mooney, "Research and Destroy: How the Religious Right Promotes Its Own *Experts* to Combat Mainstream Science", *Washington Monthly* 36 (2004): 34. <http://www.washingtonmonthly.com/features/2004/0410.mooney.html>

> "No longer is it enough. . . 'to wave the flag of Galileo.' That flag is being waved by all those molecular biologists who hold what Chargaff called the Devil's Principle: 'Whatever can be done, must be done.' That principle had already been obeyed when scientists went ahead with the construction of the atomic bomb on the ground that it was merely superb physics and that after all it was, to quote Oppenheimer's defense of it, a technically sweet project."[48]

What then is the proper role of religion in the ethics for science? To answer this, we will primarily explore the traditional Catholic approach of natural law which sees a harmony between reason and faith. Rationality is the common basis and the starting point of ethical reasoning, but it is not the only font of knowledge since it is open to transcendental truth and revelation.[49] The 2008 International Theological Commission (ITC) document *The Search for Universal Ethics: A New Look at Natural Law* is an outstanding update of this approach to common ethics.[50] The first numbers of this document highlight the need and awareness of a global solidarity which calls for the "search for common ethical values" amid current challenges. The ITC document recognizes the far-reaching applicability of natural law in the global context of bioethics and human rights. However, without a firm acknowledgement of human nature, human

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[48] Stanley L. Jaki, "Consistent bioethics and Christian consistency", *Linacre Quarterly* 3 (1994), 8280.

[49] See John Paul II, Encyclical *Fides et Ratio: on the Relationship between Faith and Reason*, 1998.

[50] The original document in Italian can be downloaded from <http://www.vatican.va/roman_curia/congregations/cfaith/cti_documents/rc_con_cfaith_doc_20090520_legge-naturale_it.htm>l The observations and quotations is taken from an unofficial English translation downloaded from <http://www.pathsoflove.com/universal-ethics-natural-law.html>

rights in the absence of duty and limits can be abusive.[51] On the contrary, it protects individual conscience in face of unjust laws:

> "Facing the menace of the abuse of power, and even of totalitarianism, which juridical positivism conceals and which certain ideologies propagate, the Church recalls that civil laws do not bind in conscience when they contradict natural law, and asks for the acknowledgment of the right to conscientious objection, as also the duty of obedience in the name of obedience to a higher law."[52]

Confronting relativistic individualism—in which every subject decides for himself what is good and right—and cautious about democratization of ethics based on consensus, natural law proposes objective moral truths knowable by human reason. As a matter of fact, the most recent encyclical by Benedict XVI emphasizes the indivisible characteristic of human ethics—ecology, bioethics, social ethics and business ethics all form a single book.[53] Natural reason can engage secular positions in public debate by presenting non-sectarian arguments, which are also directed towards individual and common good.[54]

Grounded on our natural capacity to reason, it can concurrently counteract the claims of cultural relativism while permitting intercultural and interreligious dialogue. In fact, Pope John Paul II spoke of a "grammar," "a *moral logic* which is built into human life

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[51] See *The Search for Universal Ethics*, no. 18–35.

[52] *The Search for Universal Ethics*, no. 35; see also John Paul II, Encyclical *Evangelium Vitae: on the Value and Inviolability of Human Life*, 1995, no. 73–74.

[53] See Benedict XVI, *Caritas in Veritate: on Integral Human Development in Charity and Truth*, 2009, no. 51.

[54] See *The Search for Universal Ethics*, no. 35.

and which makes possible dialogue between individuals and peoples."[55] Joseph Ratzinger, in a famous interchange with German philosopher Jürgen Habermas, points out the fact that secularization which marginalizes the place of religion in society and politics in the West is in fact an anomaly compared to the rest of the world. He believes that secular rationality without any limits and is not comprehensible to all humanity. In this dialogue, he emphasized that faith and reason needs one another, to purify one another from possible excesses.

"We have seen that there exist pathologies in religion that are extremely dangerous and that make it necessary to see the divine light of reason as a 'controlling organ'. Religion must continually allow itself to be purified and structured by reason. . . There are also pathologies of reason, although mankind in general is not as conscious of this fact today. There is a hubris of reason that is no less dangerous. This is why reason, too, must be warned to keep within its proper limits, and it must learn a willingness to listen to the great religious traditions of mankind. If it cuts itself completely adrift and rejects this willingness to learn, this relatedness, reason becomes destructive."[56]

The then-cardinal continues that global ethics derived in this manner "remains an abstraction." This hubris of reason is dangerous and threatens humanity, as the atomic bomb and the treating of humans as products have shown. Instead, a healthy tension between faith and reason, avoiding the extremes of fideism and rationalism,

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[55] John Paul II, Address to the Fifteenth General Assembly of the United Nations Organization, 5 October, 1995. http://www.vatican.va/holy_father/john_paul_ii/speeches/1995/october/documents/hf_jp-ii_spe_05101995_address-to-uno_en.html

[56] See Joseph Ratzinger and Jürgen Habermas, *The Dialectic of Secularization: On Reason and Religion* (San Francisco: Ignatius Press, 2007), 76.

can take on an intercultural dimension. In fact, for Christians, Christ being the *Logos* Incarnate means that faith itself cannot be *illogical*. Even though natural law finds its fulfillment in the new commandment of charity of Christ, it does not exclude dialogue with other groups on a common basis that is above cultural and religious differences.[57]

Conclusion

This paper has addressed two challenges of the place of ethics in science. The first deals with the problem of scientism and nihilism which in effect negates the needs of ethics as an independent audit of the scientific enterprise. The second challenge relates to the question of finding an ethical system for science, which for historical reasons has rejected natural reasoning and religious input. As a response to these challenges, some comments deriving particularly from Catholic sources would follow.

First, there is a need to reappraise the role of technological prowess by accepting our frail human condition with humility. Against the hubris of a technological imperative to create a Brave New World, many secular writers are sending signals of caution against the indiscriminant use of these powers. Jewish ethicist Leon Kass cautions about such possibility:

> "At long last, mankind has succeeded in eliminating disease, aggression, war, anxiety, suffering, guilt, envy, and grief. But this victory comes at the heavy price of homogenization,

[57] See *The Search for Universal Ethics*, pp. 103–116.

> mediocrity, trivial pursuits, shallow attachments, debased tastes, spurious contentment, and souls without loves or longings. The Brave New World has achieved prosperity, community, stability, and nigh-universal contentment, only to be peopled by creatures of human shape but stunted humanity. . . Brave New Man is so dehumanized that he does not even recognize what has been lost."[58]

The self-sufficient and self-centered technocratic society is ultimately unsatisfying and miserable. As Pope John Paul II in *Veritatis Splendor* emphasizes repeatedly, true freedom means responsibility. Perhaps what is needed is greater humility to see and accept our human condition in the face of technological modernity. It also means accepting our contingency and fallibility when events may escape our efficient programming. This might require fortitude and courage to make amends while trusting in providence.[59]

In place of an unrealistic reliance on technology, we need to recognize that our ultimate hope cannot be based on the flimsy nature of created matter. Heidegger was ambiguous about the dilemma of technology. In an interview on the same question before his death, the German philosopher uttered the now famous refrain, "Only a God can save us." [60] Since Heidegger was an agnostic, he probably meant to remind us of the need to recover a sense of wonder and admiration toward nature, rather than callously exploiting it. There are elements

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[58] Leon Kass, "Preventing A Brave New World," in *The New Republic Online* (June 21, 2001) <www.csus.edu/indiv/g/gaskilld/ethics/BanCloning.doc>

[59] See John Paul II, Encyclical *Veritatis Splendor: Regarding Certain Fundamental Questions of the Church's Moral Teaching*, 1994; Romano Guardini, Power and Responsibility.

[60] See Martin Heidegger, "Only a God Can Save Us," in *The Heidegger Controversy*, ed. Richard Wolin, (Cambridge: MIT Press, 1992), 91–116.

of truth in Heidegger's intuition that we cannot escape the *Gestell* which has become the very structure of our relations. The ambiguity of technology is all the more frightening because of the sense of impersonality and irresponsibility that came with it. Technology seems to offer hope to a suffering humanity, but technology itself can be a cause of harm.

The two recent encyclicals by Pope Benedict XVI offer other examples of theological critiques of the modern culture. *Caritas in Veritate* recalls the fact that true human development is not just technical, but primarily and integrally, human.[61] *Spe Salvi* states that the question of technology is ultimately a question of hope for a better future. The pontiff's discourse points to the vanity of this enterprise without God:

> "Francis Bacon and those who followed in the intellectual current of modernity that he inspired were wrong to believe that man would be redeemed through science. Such an expectation asks too much of science; this kind of hope is deceptive. Science can contribute greatly to making the world and mankind more human. Yet it can also destroy mankind and the world unless it is steered by forces that lie outside it."[62]

Second, against a pessimistic view that everything is relativistic and that ethical truth is too idealistic, we nonetheless need to make an effort to strive for this ideal. As a result of secularization, the current culture has turned its back on the search for universal ethics which it considers too authoritarian. The fragmented moral tradition prefers now the language of diversity and tolerance. This poses a great

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[61] See Benedict XVI, Caritats in Veritate, pp. 68–77.

[62] Benedict XVI, *Spe Salvi,* pp. 24–25.

challenge to Christianity which is universal in its doctrine, scope and ethical demands. The Christian faith does not extinguish cultural diversity, but is capable of purifying some of these elements.

This engagement is possible when reason is open to faith, while faith-based assumptions are also open to the critique of reason, thus faith and reason purify each other from possible excesses. Natural reason can thereby appeal to the conscience of all individuals to discover the good and avoid evil. Above all, derivations of the first principle of natural law are apparent—slavery, torture, racism and terrorism are to be censured. For this reason, the human rights and human dignity language can be useful in the international setting with certain legal force, on the condition that it restrains itself from excessive liberal extensions of rights; reconsider its link to natural rights; and avoiding an *a priori* exclusion of religion from discussions. In a recent homily, Pope Benedict commented on the meaning of the light of the Easter candle:

> "The darkness that poses a real threat to mankind, after all, is the fact that he can see and investigate tangible material things, but cannot see where the world is going or whence it comes, where our own life is going, what is good and what is evil. The darkness enshrouding God and obscuring values is the real threat to our existence and to the world in general. If God and moral values, the difference between good and evil, remain in darkness, then all other "lights", that put such incredible technical feats within our reach, are not only progress but also dangers that put us and the world at risk. Today we can illuminate our cities so brightly that the stars of the sky are no longer visible. Is this not an image of

> the problems caused by our version of enlightenment? With regard to material things, our knowledge and our technical accomplishments are legion, but what reaches beyond, the things of God and the question of good, we can no longer identify. Faith, then, which reveals God's light to us, is the true enlightenment, enabling God's light to break into our world, opening our eyes to the true light."[63]

As we step into this new millennium, we can hope that scientists and ethicists will discover this light and see that science does need ethics, and such ethics need not be closed to religious input or reference to the transcendent.

[摘要] 本文主要討論兩個與倫理在科學中之地位有關的難題。第一個挑戰將處理與後現代科學觀相關的一些問題；縱然在全球化下的世界，科技急速多變發展，我們與科技之間仍有一種不安感。我們將會透過以下三個角度分析形成這種不安感背後的原因：一、從歷史及哲學角度探討科學主義的根源；二、探求科技上衝創意志的根源；三、超人類主義以及道德相對主義的根源。科學主義以及虛無主義均否認倫理的需要，特別是當倫理作爲一個獨立的科學事業審計，將會爲人類帶來威脅。第二個難題關於科學應該受甚麼類型的倫理指導。爭辯常圍繞科學中是否亦有普世接受的倫理標準以及宗教在這些倫理方法中的角色。後現代主義否定宗教倫理學的貢獻的可能性，持論者認爲宗教倫理學並不能以經驗爲依據而視之爲不重要。基於上述的背景，本文以自然律的角度回應。早前教宗本篤 16 世亦撰文論述科學與倫理以及信仰與理性的正確關係。

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[63] Benedict XVI, "Pope's Holy Saturday Homily" in *Zenit News Agency*, (April 8, 2012) <www.zenit.org/article-34598?l=english>