



Biomedical Technology

Omnipresent in Contemporary Care, but Virtually Absent from Catholic Bioethics

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Abstract

Catholic bioethicists have examined specific biomedical technologies (esp. at life's beginning and end). But a comprehensive reflection on the phenomenon of biomedical technology itself is missing. Moreover, a paradox appears operative. Several such technologies are rejected as unnatural when used to regulate procreation, but deemed a natural form of intersubjective care and as such obligatory when sustaining life. Given the pervasiveness of biomedical technology in contemporary health care, an in-depth reflection on this paradox and the phenomenon of biomedical technology in general is needed. By critically reviewing the existing Catholic bioethical literature, this paper seeks to contribute to such a comprehensive ethical analysis.

Keywords: artificial nutrition and hydration, artificial reproductive technology, bioethics, biomedical technology, Catholicism, life-sustaining technology

Introduction

Biomedical technologies have become the subject of many bioethical analyses. The ethical challenges they evoke have been examined by secular ethicists as well as by those working within specific faith traditions. Catholic bioethicists are no exception; they have examined in great detail specific biomedical technologies, such as in vitro fertilization (IVF),

stem cell tissue generation, and artificial nutrition. But one looks in vain for a comprehensive Catholic reflection on the phenomenon of biomedical technology as such.

For example, both the Pontifical Academy for Life and the Pontifical Council for Health Pastoral Care have remained silent on the theme of biomedical technology. The Pontifical Academy of Sciences has devoted volumes to topics as different as biodiversity, brain death, human trafficking, spectroscopy, and the calendar; but it has not addressed biomedical technology in a systematic manner. In 2003, the Pontifical Academy of Sciences published a volume on *Stem Cell Technology and Other Innovative Therapies*. But the focus of this document is on the use of stem cells and derived therapies, not on the phenomenon of biomedical technology as such. A rare exception is a 2002 thematic issue of the journal *Health Progress*, the official journal of the Catholic Health Association of the United States, entitled *For an Ethics of Technology*. But even the papers included in this issue only skirt the topic of technology proper, discussing instead a number of related but different themes such as the ever rising cost of health care and the dangers of over-treatment at the end of life.

Given the dearth of Catholic bioethical literature on biomedical technology, the critical review presented in this article is merely an attempt at organizing a series of fragmentary thoughts by Catholic authors, found in a disparate array of presentations, guidelines, papers and proceedings, often devoted to themes other than biomedical technology proper. Such an attempt is admittedly fraught with the risk of imposing particular interpretations onto these fragments that might not have been intended by those who authored these fragments, and reflect instead this author's interpretation. Then again, if this paper elicits corrective responses from those authors, it has thus already contributed to the development of a more robust Catholic perspective on biomedical technologies.

First, the Catholic Church's ethical appraisal of technology in general will be reviewed. Using the authoritative fragments gathered, we will next discuss the magisterial concerns about fairness, respect for cultural diversity, and the importance of what in this paper is called "groundedness." This then leads to a discussion of the relationship between technology and nature.

Following a preliminary assessment of our findings up to that point, we then turn our attention to a remarkable paradox that appears to be operative in Catholic bioethical thinking about biomedical technologies. Such technologies are generally rejected as immoral when they are used to regulate the procreative process, both when they are used to prevent conception and when they are used to overcome infertility. The insertion of biomedical technologies into the sexual relationship between a husband and wife is viewed as a violation of the nature of that relationship and an affront to its sanctity. But at the end of life, it would seem that there is no limit to the amount of technology that may be used to extend human life. Indeed, some of these technologies (such as a percutaneous endoscopic gastrostomy (PEG) tube to administer artificial nutrition and hydration) are no longer viewed as an invasive technology but instead as a natural form of intersubjective care.

In devoting half of this paper to the aforementioned paradox, this paper actually perpetuates the overly narrow Catholic reflection on biomedical technologies (focusing on the beginning and end of life only) that this paper was intended to overcome. In a concluding section, an attempt will be made to draw conclusions that have a broader reach

and in doing so, stimulate the development of a comprehensive Catholic reflection on twenty-first century biomedical technology.

The Church's Overall Stance towards (Biomedical) Technology

A first observation that can be made about the Church's general stance on technology is that rarely a distinction is made between technology and science. Almost always in papal statements, documents of the various Vatican academies, and other magisterial sources, the authors talk about "science and technology" in one breath. Or in the words of the Pontifical Academy of Sciences, "technology is a part – or a phase – of science and actually can be considered an operational aspect of science, so closely related that it is difficult to differentiate it from science" (1979: 7). To the extent that the Magisterium has viewed technology to be distinct from science, it seems to generally have considered technology to be the handmaiden of science. Indeed, Pope Paul VI called technicians the "brilliant pupils" of scientists (1968a: 127). The scientist, or more precisely the "disinterested seeker" should "precede" and then "accompany" the technician (Paul VI 1972: 135). And both, in turn, should be guided by conscience (John Paul II 1979: 152).

When the topic "Catholic Church and science" surfaces, it is often assumed that the Church's views have not changed since the seventeenth century when it condemned Galileo Galilei. But the opposite is true. These days, the Church is actually very optimistic about science, and even home to scientific entities such as the Vatican Observatory and the aforementioned Pontifical Academy of Sciences to which some of the world's most prominent scientists belong, including several Nobel laureates. Already in 1948, Pope Pius XII ensured the scientists in his audience: "We *admire* the hands and the intellects of the disciples of nature, which you are, in your schools, in your laboratories, in your offices, in your workshops, in your arsenals . . . In your imaginations and in your minds you form, invent and construct *wonderful* images and plans of devices, of instruments, of telescopes, microscopes and spectroscopes, and of thousands of other means available nowadays to tame, harness and to direct the natural forces" (61, emphasis added). And his successor, Pope John XXIII, exclaimed: "You know how much *We share the delight and satisfaction* deriving from the *brilliant* results obtained by the scientists and technicians of our day, who have succeeded in taming nature in a way which, but lately, would have seemed impossible to the most fertile imagination" (107, emphasis added).

Given the Church's overall positive attitude towards science, at least in the most recent century, we can thus conclude that the Church's view of technology is positive as well, at least generally speaking (e.g., Moraczewski). Conversely, the concerns it has voiced about technology are the same as it has about science – more on these later; there does not appear to be much concern about technology as such, separate from its scientific precursor. This optimism towards technology is tempered only by a rather generic admonition to engage technology in a morally sound manner: "Technology, as the transfer of science to practical applications, must seek the good of humanity and never work against it. Therefore science and technology must be governed by ethical and moral principles" (John Paul II 1987: 298). But this admonition begs the question exactly which ethical and moral principles shall guide the development and use of technology.

As already pointed out, one looks in vain for an in-depth magisterial reflection on biomedical technologies. A rare acknowledgment that the ever-expanding presence of technology in health care may not be the most desirable of developments is the 1979 caution from the Pontifical Academy of Science. While addressing the transfer of biomedical innovations from highly developed nations to developing nations, it cautioned that “care must be taken not to try to transfer to these countries the highly specialized structures which characterize modern medicine, and perhaps represent *an excess of technology* in the medical field” (40, emphasis added).

The only area of biomedical technology that consistently evokes magisterial concerns is reproductive biomedical technology, broadly understood. For example, the Congregation for the Doctrine of Faith (CDF) in its 2008 *Instruction Dignitas Personae – on Certain Bioethical Questions* starts off by pointing out that “new biomedical technologies which have been introduced in the critical area of human life and the family have given rise to further questions . . .” This suggests that a comprehensive assessment of contemporary biomedical technology can be found in the document. But the continuation of the quoted sentence reveals the much more narrow focus of the document: “. . . in particular in the field of research on human embryos, the use of stem cells for therapeutic purposes, as well as in other areas of experimental medicine” (1). In fact, only one biomedical technology is discussed in some detail, that is, artificial reproductive technology (ART). A year later, the Prefect of the CDF, Cardinal Levada, in an address to participants at a conference in Radom, Poland, stated: “It seems every week the press carries a new article about some development in the area of biomedical technology. Allow me to cite just three examples.” The three examples listed next involve two on IVF and one on embryonic stem cells. Likewise, Zycinski’s 2006 article, notwithstanding the title “Ethics in Medical Technologies: The Roman Catholic Viewpoint,” is mainly concerned with reproductive technologies, cloning and human enhancement, but not with biomedical technology as such. And that is true as well for Lauritzen’s 2010 chapter on “Technology and Wholeness,” which – as the subtitle “Oncofertility and Catholic Tradition” signals – only addresses reproductive technologies.

In a later section, we will return to the area of reproductive medicine. But surely, most of the biomedical technologies currently in use are not all related to this one area of health care. Even the briefest of visits to a modern hospital reveals the abundance of technologies, ranging from the simple thermometer to the CAT scanner, from the neonatal intensive care unit to the blood bank, and from the electron microscope to the rescue helicopter. Hence, a critical examination of the phenomenon of biomedical technology should not be limited to reproductive medicine only.

This paper is concerned with the phenomenon of biomedical technology itself. It will not, therefore, attempt a comprehensive ethical analysis of the various modes of *treatments* in which these technologies are typically employed. Thus, we will not seek to provide an assessment or even a detailed description of the Church’s teaching on reproductive medicine, but only on the specific place of biomedical technology within this field of medicine. Likewise, we will not review the Church’s teachings on the ethics of end-of-life care, but only examine the role of life-sustaining technologies themselves.

This raises the question exactly how “technology” shall be defined. Within the secular literature we can readily find multiple critical studies on the nature of technology. But since there is a veritable dearth of magisterial documents on this topic, for the purposes of this paper the following stipulative definition of technology will have to suffice: the replacement of human activities by machinery. This admittedly simplistic definition makes clear, firstly, that this paper is not concerned with particular “ways of proceeding,” also called “techniques,” but only with machineries. Secondly, this paper is not concerned with tools and other relatively simple instruments (sometimes called “low technologies”), which can properly be seen as extensions of the human body, rather than their replacement. Using this definition, three types of biomedical technologies can be distinguished by what they replace: Those that replace (1) human care of a diseased fellow human being (e.g., automated monitoring of a patient’s vital signs); (2) human functions that are themselves pathogenic (e.g., dialysis to replace a malfunctioning kidney); or (3) both (e.g., artificial nutrition replacing the practice of manually feeding a patient who is unable to eat).¹

As mentioned earlier, Pope John Paul II insisted that “science and technology must be governed by ethical and moral principles” (1987: 298), without, however, specifying the ethical and moral principles that should be followed. Similarly, the United States Catholic Conference of Bishops in their *Ethical and Religious Directives for Catholic Health Care Services* call upon health care professionals and their patients to “evaluate the use of the technology at their disposal” (2009: Part V). But again, no principles are outlined in this document to use in the recommended evaluation, in any event no principles that are specific to this particular evaluative process. However, it appears possible to extract from the various magisterial statements on biomedical technologies several principles or ethical guideposts for assessing such technologies.

Fair Access

A first such ethical guidepost pertains to the accessibility of new technologies. Echoing Pope Leo XIII’s reminder that “God has given the earth for the use and enjoyment of the whole human race” (8), a century later Pope John Paul II reminded the attendees at the 2000

¹ While machines to enhance rather than completely replace the provision of health care (whether a stethoscope or a neonatal intensive care unit) are included in this definition, excluded from the definition and our examination is any machinery that is solely aimed at enhancement of persons who are normal rather than diseased, disabled or traumatized.

A more complex question is whether medications qualify as technologies. They are not properly machines but more akin to nutrients consumed. Thus, one could argue that the insulin pump for a diabetic is a technology but the insulin itself is not. However, such a conceptual separation seems untenable in reference to a pacemaker that delivers an electrical current to the heart. Additionally, as nanotechnologies are being developed, the difference between “machines” and “medications” becomes ever less clear.

A third question that we cannot examine in detail here involves the difference between technological and artificial biomedical interventions. Most of the authors we are citing in this paper do not distinguish between the two, juxtaposing both of them to “natural” forms of care. However, some authors draw different lines of distinction – as will be discussed later in this paper. More confusingly yet, some authors use “artificial” both as a morally neutral descriptive synonym of “technological” and as a negative prescriptive synonym of “unnatural” (see, for example, Di Pietro and Spagnolo 2005).

Jubilee of the Agricultural World that “what God has given man, he has given with the heart of a father who cares for his children, no one excluded. God’s earth is therefore also *man’s earth* and that of *all mankind*.” (2000a: 5). Similar concerns had been voiced a year earlier by the participants of a study week on the subject of “Food Needs of the Developing World in the Early Twenty-First Century,” organized by the Pontifical Academy of Sciences. The focus of this meeting was world hunger and new biotechnologies, in particular genetic engineering. Commenting on the congress, Sorondo pointed out that “the need to examine the ways by which developing countries could gain access to these new forms of technology was deemed urgent. In general, this requires finding the right methods by which to balance general public interest with the search for gain by private individuals or companies” (2003: XLV).

It is important to note that the cited documents do not appear to discourage development of such new biotechnologies for fear that their emergence will only widen the gap between the rich and the poor. The Church’s optimism towards scientific and technological progress identified earlier appears to be operative here too. Admittedly, it is remarkable how new technologies have a way of becoming universal. iPhone and Facebook are now used by people all over the world, even by those living in remote mountain villages in developing countries. Still the question has to be raised whether fair access to new technologies will always materialize. What is true of relatively cheap technologies, such as cell phones, has not become true of more complex and more expensive technologies, such as renal dialysis units or even X-ray machines. It is highly doubtful that the anti-aging technologies that are now being developed in economically advanced nations will be available to more than a very small segment of the world’s population. This problem increases to the extent that the particular technologies are necessarily tied into and depend on a larger technological context for their effective functioning, as is typically true of biomedical technologies.

Respect for Cultural Diversity

This also leads us to the second moral guidepost that can be gleaned from magisterial reflections on biomedical technologies: respect for cultural diversity. New technologies have a way of inserting themselves into all kinds of environments and social contexts with complete disregard for the specifics of those contexts. The same iPhone is being used by people all over the world, irrespective the traditional modes of communication that had developed in their particular social context over the ages. What Pope John Paul II said about modern space technology, that is, that it “must not be used by any form of cultural imperialism, to the detriment of the authentic culture of human beings in the legitimate differences that have developed in the history of the individual peoples” (1984: 181), appears to apply equally to many other new technologies, including biomedical technology. Modes of caring for dying patients vary dramatically in different contexts and cultures. But the life-sustaining technologies that are nowadays used in hospitals are the same all over the world, leaving little or no room for culturally diverse practices of caring for the sick and dying.

Groundedness

In much the same way that technology can result in people becoming culturally uprooted, there is the danger that people become uprooted from their natural environment. Pope Paul VI already expressed concern that “agriculture, once traditional and following a customary pattern, gradually becomes expert and technical. The peasant is replaced by the rural cultivator” (1972: 138). More recently, the Pontifical Council “Cor Unum” worried about agricultural intensification: “Agricultural technologies are now becoming independent of the land, which is their natural medium. The reciprocity which formerly linked them is being reduced and replaced by a more hazardous duality between agricultural technology and the economic environment” (21).

These concerns about human beings remaining literally “grounded” – a term not itself used in the aforementioned magisterial documents – in their natural living environment can also be voiced analogically about the relationship of human beings to their own bodies. Biomedical science considers the human body a complex machine, a chemical factory annex supercomputer. This reductive perspective is what enables the biomedical sciences to develop reliable diagnostic techniques and effective therapies. But these gains come at the price of ever increasing difficulties on the part of health care professionals to care for the patient as a whole. And so we find the United States Catholic Conference of Bishops rightly cautioning health care professionals, “without health of the spirit, high technology focused strictly on the body offers limited hope for healing the whole person” (1981: 12).

Few people other than biomedical scientists and health care professionals trained in the biomedical sciences, share in the aforementioned scientific understanding of the human body as a kind of a chemical factory annex supercomputer. But technology, as the material incarnation of science, turns science into a visual and tangible reality for health professionals and patients alike. It thus contributes to the spread of this mechanistic and reductionist understanding of the human body.

Relationship to Nature

The foregoing reflections lead us to consider what is surely the most important component of a specifically Catholic assessment of biomedical technologies: their relationship to nature. Following Drane, two paradigms can be distinguished. Whereas St. Thomas Aquinas and his contemporaries in the thirteenth century had deemed technologies to be morally good when and because they *imitate* nature,² according to fourteenth century theologians such as Scotus and Ockham, humans are called to *dominate* nature. The latter, more optimistic view about the capability of humans to outdo nature became the foundation of the enlightenment and ultimately of our contemporary faith in science and technology. Drane does not elaborate on this paradigm shift, but scholars of medieval technology such as Ferkiss (1993) and White (1978) also describe it.

² Ea quae sunt secundum artem imitantur ea quae sunt secundum naturam, et tanto magis opus artis est melius quanto magis assequitur similitudinem eius quod est in natura (Aquinas, *De regimine principum*, lib. I c.2), freely translated by White as: “Art is imitation of nature. Works of art are successful to the extent that they achieve a likeness of nature” (32).

White points out that this paradigm shift was not universally adopted within Christianity, as can be illustrated quite nicely in reference to the newly invented mechanical clocks. Whereas these were by and large abhorred by the eastern Christian churches of the late Middle Ages as an affront to the concept of eternity, they were readily adopted and placed on top of, and even inside many churches in the west: “Clearly, by the later Middle Ages, western men felt psychically compatible with machines” (249). Indeed, “technological aggression, rather than revered coexistence, is now man’s posture towards nature” (251).³

Virtually all magisterial pronouncements in the twentieth and twenty-first century about biomedical and other advanced technologies appear to reflect the domination paradigm. Earlier we cited the 1948 address of Pius XII to the gathered scientists: “You form, invent and construct wonderful images and plans of devices, of instruments, of telescopes, microscopes and spectroscopes, and of thousands of other means available nowadays to *tame, harness and to direct* the natural forces” (61, emphasis added). So too the 1962 statement by his successor John XXIII: “You know how much We share the delight and satisfaction deriving from the brilliant results obtained by the scientists and technicians of our day, who have succeeded in *taming nature*” (107, emphasis added).

Humankind is permitted in this view even to rewrite what some (see, e.g., Clinton; Collins) have labeled God’s script for nature, that is, the genome: “I have learned with satisfaction that among the themes discussed during your Study Week you have focused attention on in vitro experiments which have yielded results for the cure of diseases related to chromosome defects. It is also to be hoped . . . that the new technique of *modification of the genetic code*, in particular cases of genetic or chromosomal diseases, will be a motive of hope for the great number of people affected by those maladies,” thus Pope John Paul II (1982: 167, emphasis added). In a similar vein, the USCCB has approvingly pointed out that “through science the human race comes to understand God’s wonderful work; and through technology it must conserve, protect, and *perfect nature* in harmony with God’s purposes” (2009: 9, emphasis added).

As the latter quote makes clear, the domination paradigm is not absolute. When scientists and technicians set out to “perfect” nature, they ought to do so “in harmony with God’s purposes.” But meeting this condition is difficult. For how shall we determine what God’s purposes are? The traditional answer used to be that we can find the answer in God’s creation itself, that is, in nature. This conviction underlies the ethical theory of “natural law,” a staple of Catholic moral theology. Thus, we find Pius XII cautioning scientists and technicians: “Your art does not create the material which is in your hands, but only modifies it with cognitive skill, and rules its action *according to the laws which you have discovered for yourselves*, combining and matching your practical and technical knowledge of the reality of things with your speculative knowledge of the same real things” (1948: 61, emphasis added).

³ That this western Christian embrace of technology was certainly not shared universally can also be illustrated quite aptly by Mahatma Gandhi’s stance towards technology. Writing in the early twentieth century, he lashed out against technology: “Neither railways nor hospitals are a test of a high and pure civilization. At best they are a necessary evil . . . Machinery is the chief symbol of modern society; it represents great sin” (10, 95).

At first sight it may seem that Pope Pius XII is referring here to the physical laws of nature, such as the law of gravity or the laws of thermodynamics. But that type of caution would be trivial, since any attempt by engineers to build technologies that defy such physical laws is futile. The caution only makes sense if Pius intended to refer here to the much richer concept of the moral laws of nature, which is informed by physical laws of nature but cannot be reduced to them. But now the question arises what those moral laws of nature actually prescribe and proscribe vis-à-vis the use of (biomedical) technologies, a question left unanswered by the Holy Father in his address.

Rather than the very broad concept of natural law, the U.S. bishops invoke instead the much more specific concept of personhood as a guiding principle. Earlier we quoted the bishops' caution that "without health of the spirit, high technology focused strictly on the body offers limited hope for healing *the whole person*" (1981: 12, emphasis added). And in the fifth edition of their Ethical and Religious Directives for Catholic Health Care Services (ERDs), we find the observation that "in a time of new medical discoveries, rapid technological developments, and social change, what is new can either be an opportunity for genuine advancement in human culture, or it can lead to policies and actions that are contrary to *the true dignity and vocation of the human person*" (General Introduction, emphasis added). These cautionary observations lead us back to our earlier reflections about the impact of technology on our understanding and evaluation of the human body, and the relationship between personhood and the human body.

Many contemporary secular bioethicists understand personhood essentially as autonomy: A person is any being that is free and able to determine his or her own being, including his/her body. In this view, a person's body is not fundamentally different from a person's belongings. But this understanding of personhood is at odds with a Catholic understanding that emphasizes that being human is fundamentally being an embodied subject, and not just during our earthly life but also in the hereafter. Hence, the human body is not an object controlled by the human subject; rather the human subject is itself embodied and the body is as much constitutive of the human subject as is the human mind.

Thus, biomedical technologies that supplant the body not only are ethically precarious when and to the extent that they cause the person to lose his grounding in the same way as a farmer can lose the connection to the land due to agricultural technologies. Such biomedical technologies can in fact become an affront to the human person himself who is necessarily and by his nature an embodied subject.

This, then, explains why critics of contemporary reproductive technologies worry about technologies replacing the corporeal act of intercourse and even pregnancy (about which more will be said below): "The increasingly massive and exorbitant technical intervention of the treatment of sterility has brought about an authentic anthropological mutation in this phenomenon. Here we encounter the core of the problem of artificial reproduction. Gradually the corporeal dimension of human procreation was seen as being purely accidental compared to the wish to have a child. The essence of parenthood has been made to lie in the decision to procreate, independently of the corporeal conditions through which it is implemented. As a result, these conditions, deprived of symbolic and relational meanings, have been left to the mercy of technical manipulation and of being replaced by contracts"

(Melina: 61). In a similar vein, the USCCB in its 2009 ERDs admonishes health care providers that “the well-being *of the whole person* must be taken into account in deciding about any therapeutic intervention or use of technology (Part II: 33, emphasis added). This, in turn, requires that “the use of life-sustaining technology is judged in light of the Christian meaning of life, suffering, and death. In this way two extremes are avoided: on the one hand, an insistence on useless or burdensome technology even when a patient may legitimately wish to forgo it and, on the other hand, the withdrawal of technology with the intention of causing death” (Part V, Introduction).

Preliminary Assessment

Our analysis up to this point leads to the preliminary conclusion that the Catholic Church, at least in the past century, has generally been very optimistic about the possibility of technology to improve the human condition. “Nature,” according to the Pontifical Academy of Sciences, “is ‘incomplete’ or unfinished as it is always open to new developments, through a combination of its energies. Moreover, it is subject to disease and death, to loss of energy and to destructive clashes between opposing forces. Confronted with the incompleteness and the degradation, man, both the scientist and the technician, must use his intelligence to coordinate, animate, appropriate for his own benefit the forces of nature and to counteract its degenerative processes” (1979: 23). At times, in its encouragement to tame, harness, direct and even redirect nature through technology, the Magisterium appears to place even more faith in the ability of humankind to develop and apply technologies in an ethically sound manner than do secular authors.

This optimistic view towards technology does not go completely unchallenged. We find church leaders expressing concerns about fairness, the importance of preserving cultural diversity, groundedness, and human dignity. Occasionally, we even encounter a very critical observation, as when the Pontifical Academy of Sciences continued its statement quoted above with these acerbic words: “If it is man’s ideal task to perfect the work of creation and to combat degeneration, his action is often insane, as it has been in the past and is still today in our age of technological progress and industrial civilization. In fact, man wants above all to dominate nature and to exploit it, impoverishing it, in order to increase production; thus he is creating new and dangerous processes of degeneration” (1979: 23). But such forceful criticism is rare, and no similarly strong cautions have been found *vis-à-vis* biomedical technologies. Rather than issuing definitive moral rules regarding biomedical technologies, the few times that church authorities have addressed these technologies, they call on the flock to prudently seek balance in their development and application.

There are, however, two remarkable exceptions. The Magisterium has issued very specific and quite definitive sets of guidelines for the use of biomedical technologies in two particular areas of medical care: the regulation of conception and the provision of artificial nutrition and hydration (AN&H) at the end-of-Life. These exceptions are remarkable not only because they are the only two areas, when modern medicine is replete with technology. What is most striking is that in the former instance the Church *proscribes* technology, when in the latter instance it *prescribes* technology, deeming such technologies *unnatural* in the former instance but *natural* in latter instance. This remarkable paradox invites further examination

and in the remainder of this paper, we will review each of these two types of biomedical technologies in greater detail.

But before we do so, we need to once more repeat the caveat made earlier. This paper does not intend to present a comprehensive ethical analysis from a Catholic perspective of these two areas of medical practice. For such an analysis, the reader is urged to read in full the various magisterial documents on these practices cited below. Here, they are referenced only because and to the extent that they involve a biomedical technology; for it is the technologies that this paper is concerned with, not the practices themselves.

The Regulation of Conception: Contraception

Not all interventions in the field of reproductive medicine evoke ethical concerns on the part of the Magisterium. The use of technologies to overcome infertility is not categorically prohibited. But the regulation of conception, both preventing and promoting conception, has evoked and continues to evoke a lot of concern. One reason why the practice of contraception is ethically suspect is its close link to *abortus provocatus*. Since abortion, defined as the intentional termination of the life of a human being post-conception but before birth, is understood as homicide and as such considered a grave moral error, any practice that cannot clearly be distinguished from abortion becomes morally suspect too. Thus, intra-uterine devices and post-coital emergency contraceptives that are designed to prevent conception but can also kill an already conceived embryo are considered immoral. Secondly, contraceptives of all kinds are morally suspect because they are viewed as part of a slippery slope that ends in abortion.

But even pure (i.e., non-abortive) contraception, practiced by couples who would never consider an abortion if the contraception fails and a pregnancy occurs, is morally suspect and prohibited according to the Magisterium when it is achieved through barrier technologies such as a condom, diaphragm, or tubal ligation, or, more broadly, through artificial means such as hormones. The question now arises why this practice of contraception is morally suspect. Indeed, a large majority of Catholics has difficulty understanding the Church's teachings in this area and does not abide by the proscriptive rules. In response, the rules about the types of contraception that are and are not allowable have become ever more detailed and specific to a degree rarely encountered in other areas of magisterial teachings. Even Pope Francis I, while not reversing the existing body of teachings against contraception, has encouraged church leaders not to focus only and in an overly regulatory manner on contraception.⁴

More vocal critics have contended that the Church's teaching on contraception reflects the preoccupation of celibate priests with sexuality or, worse, an attempt by the male

⁴ "We cannot insist only on issues related to abortion, gay marriage and the use of contraceptive methods. This is not possible. I have not spoken much about these things, and I was reprimanded for that. But when we speak about these issues, we have to talk about them in a context. The teaching of the church, for that matter, is clear and I am a son of the church, but it is not necessary to talk about these issues all the time. The dogmatic and moral teachings of the church are not all equivalent. The church's pastoral ministry cannot be obsessed with the transmission of a disjointed multitude of doctrines to be imposed insistently" (Francis I: Section on "The Church as Field Hospital").

dominated church leadership to suppress the freedom of women. Even if some of these nefarious forces are at work in a church which is, after all, made up of human beings, these critiques overlook one important aspect, an aspect that many defenders of church teaching overlook as well: the Magisterium has not issued a blanket prohibition against contraception. As mentioned already, the practice of contraception is morally permissible provided it does not involve technology and other artificial means, but is achieved naturally.⁵

It is not easy to separate out which parts of church teaching are about the practice of sexuality and which are about the regulation of conception proper. Indeed, the Magisterium teaches that the sexual act has two intrinsic and inseparable meanings, the unitive meaning and the procreative meaning; any directly intended separation of these two meanings is intrinsically disordered. Furthermore, married couples engaging in sexual intercourse must always be open to the possibility of the transmission of life and, conversely, human procreation should never become a nonsexual act. This perspective, sketched here in the broadest of strokes only, undergirds the prohibition against pre- and extramarital intercourse, irrespective of the use of contraceptives. It also drives much of the debate about artificial reproductive technologies (about which more will be said below). Nevertheless, the link between sexuality and procreation is not complete. That is to say, not every sexual act between a married woman and man has to be aimed at conception in order to be morally permissible. Pope Pius XII acknowledged that “serious motives,” whether of a “medical, eugenic, economic, or social nature,” may exist for a couple to intentionally limit their sexual intercourse to those periods in which the woman is known to be infertile (1951: Section III, par 17). This teaching was seconded by Pope Paul VI in his 1968 encyclical *Humanae Vitae*, which is specifically devoted to the regulation of birth (16). A variety of strategies to regulate fertility may be employed by the couple, which are typically lumped together under the header “natural family planning” (NFP).⁶

Different experts advocate somewhat different NFP methods based on their supposed ease of use and success rate at avoiding conception. But they usually involve some combination of tracking the woman’s menstrual calendar, her body temperature, and changes in the vaginal mucus. All of these should enable the couple to precisely determine the period during which the woman is fertile. By engaging in intercourse outside of this period of fertility, conception can be prevented.

⁵ It is important to emphasize here that magisterial documents tend to discuss these contraceptive practices under the header of “Natural Family Planning” (NFP), about which more is said below, even if the couple engages in such NFP with the specific intent of preventing conception. In this paper the term “contraception” is used more broadly to encompass all acts of intentionally preventing conception. It is not presumed that such acts necessarily signal a couple’s anti-life stance or unwillingness to accept children into their marriage.

⁶ Advocates of NFP do not typically describe NFP as a form of conception because the same technique can be used both to decrease and increase the odds of conception. However, they do advocate NFP specifically as a way for couples to “avoid pregnancy,” and tout its avoidance effectiveness rate of 94.6% to 97.9% (as stated on the website of the Pope Paul VI Institute for the Study of Human Reproduction, one of the leading centers for NFP; see www.creightonmodel.com). If contraception is defined, in accordance with the etymological origin of that term, as an act aimed at preventing conception during sexual intercourse, then a couple using NFP to avoid rather than to achieve pregnancy is in effect engaged in contraception.

These methods are also used to *increase* the odds of conception when a couple *wants* to have a child but has not been able to conceive. But this fact is not itself the justification for the moral permissibility of their contraceptive use. No recourse to the principle of double effect is necessary. For it is morally permissible for a couple to use these methods solely, explicitly and intentionally to *prevent* conception. Thus the question arises what renders these contraceptive methods morally permissible, when so-called “artificial” methods such as hormonal and barrier methods are not. As the label “*natural* family planning” suggests, what renders them permissible is their supposed naturalness as opposed to artificiality. This, then, raises two new questions.

Why is it, firstly, that the contraceptive means advocated as NFP are deemed “natural” rather than “artificial” when they clearly involve technologies as well? These technologies – a clock, thermometer, and ruler – admittedly are far simpler than IUDs or tubal ligation techniques. They may even be labeled “low” technologies. But artificial they are.

For sure, NFP interventions do not themselves have an anatomical or physiological impact, as do sterilization or hormones. Thus they can be said to leave the natural state of the woman unaffected. But this leads us to the second and more urgent question. Why is it that in the area of conception, the older paradigm is resurrected and applied in which science and technology are morally permissible only if and to the extent that they *mimic* nature? Why is it that the more recent paradigm in which humankind is called to *tame, regulate, direct* and even *redirect* nature, using science and technology, is not applicable here? This shift in paradigm begs to be explained and justified.

The Regulation of Conception: Overcoming Infertility

A similar inconsistency surfaces in the Catholic Church’s stance on technologies that *increase* rather than *decrease* the odds of conception. Before we examine this inconsistency, we should point out once more, as we have already done in reference to contraceptives, that the ethical concerns on the part of the Magisterium engendered by various forms of artificial reproductive technology (ART) are not only motivated by the specifics of the interventions but also by the broader socio-cultural patterns of which these technologies are part. Thus we find the Pontifical Academy for Life in its 2005 report on *The Dignity of Human Procreation and Reproductive Technologies* conclude: “We refer here to the progressive emergence of a new mentality, according to which recourse to ART constitutes a preferential route – compared to the ‘natural’ route – to bring a child into this world because it is possible through these techniques to exercise a more effective ‘control’ over the quality of the conceived child in line with the wishes of those who ask for such a child. All this works in favor of seeing the child obtained through the use of ART as being on the same level as a ‘product’ whose value in reality depends in large measure on its ‘good quality’, which for its part is subjected to severe controls and careful selection. The dramatic consequence of this is the systematic elimination of those human embryos that lack the level of quality that is held to be sufficient, and, moreover, according to parameters and criteria that are inevitably disputable” (De Dios Vial Correa and Sgreccia: 7).

In addition, certain ARTs are used in a manner that generates moral dilemmas independent of the goal of procreation proper. It is, for example, very common in cases of

IVF for multiple eggs to be fertilized, some of which are not reinserted into the woman's uterus but stored in the laboratory to facilitate a second attempt in case pregnancy does not occur after the first attempt. This, in turn, leads to spare embryos cryopreserved in coolers indefinitely, or worse, killed or used as tissue donors. As morally objectionable as this "collateral damage" of IVF is, it does not suffice to deem the practice of IVF *itself* immoral. It is possible to perform IVF without fertilizing more than one ovum. What we are concerned with here is which reproductive technologies are morally suspect precisely *qua* technologies.

Here, again, we have to begin by pointing out that not all ARTs are prohibited by the Magisterium. Indeed, most are not. Anatomical barriers to conception may be removed through the most advanced microsurgical techniques and technologies, and pathophysiological conditions that appear to frustrate implantation may be corrected. In fact, medications may be used to stimulate ovulation even in the absence of clear evidence of the cause of a couple's infertility, consistent with the paradigm that humankind is called to tame, regulate, direct, and even redirect nature. In all these instances, ART *precedes* the act of sexual intercourse. In the view of the Magisterium, moral problems arise only when ART *succeeds* intercourse. Or more precisely, when the medical intervention comes *in-between* intercourse and conception. As soon as conception has occurred, it is once again considered legitimate to apply virtually any technology to protect the embryo and to sustain the pregnancy. It is only when conception itself is not the direct and immediate result of sexual intercourse that moral problems arise. Examples of ARTs that fall into this category are all technologies that bring about extracorporal conception (such as IVF), whether heterologous or homologous, but also the technically assisted insertion of a husband's sperm in the woman's fallopian tube (when it is believed that the spermatozoa will not reach the ovum otherwise). As Di Pietro and Spagnolo summarize: "Far from being the result of a direct and immediate conjugal union, the new life becomes the product of a technical procedure that can also be perfect from the scientific point of view but remains, in any case, impersonal. It is not the parents that give life to the child but a doctor or biologist" (122).

Oddly, one ART which clearly interrupts the progression from intercourse to conception but which is allowed, at least according to some Catholic scholars, is Gamete Intrafallopian Transfer (GIFT), or at least some forms thereof. Di Pietro and Spagnolo readily concede that the "collection [of] sperm during the conjugal act with a perforated condom . . . to then introduce it in the female reproductive tract" involves "recourse to technology, to artificiality: however, the intervention of the doctor is successive to the conjugal act" (122). In being successive, the technology does not cancel "that which is specific to generative act" (122).

But this observation begs the question as to what is specific to the generative act. More restrictive, but also more consistent, appears to be the stance towards GIFT taken by Watt in the same collection of conference proceedings: "Even in a case where no condom was used, so that marital self-giving was in no way compromised by the intentional withholding of sperm, the withdrawal of sperm from the woman's body would nullify the effect of intercourse in bringing sperm and ovum closer together. The father in this case would be justified in thinking that he did not cause – even partly – the uniting of the gametes: he

merely made sperm available which was later brought towards the ovum by a technical procedure” (21).

But Watt does not prohibit *every* type of medical-technical interference in the process of conception. She goes on to say: “In contrast, if the sperm were merely assisted in its journey towards the ovum, the man would know that he contributed to causing that journey, and thus to causing conception. It is not necessary that the entire journey be caused by the husband and wife: after all, no sexual act could cause conception were it not for the final act of God in creating a new soul. Providing intercourse unites the couple, where that very uniting brings sperm and ovum closer together in a way that is not then cancelled by the sperm’s subsequent removal, the child owes its origin to an act with the kind of human dignity that his or her own dignity requires” (21).

The question now arises why it is permissible for medical technicians to stand by while husband and wife engage in sexual intercourse, and, shortly after ejaculation, to take over and, using sophisticated technologies, collect and transfer the sperm into the woman’s fallopian tube. This process seems very much at odds with the paradigm of mimicking nature. Conversely, if the domination paradigm is normative, this type of GIFT does not seem to differ significantly from the process in which a perforated condom is used.⁷ Quite sensibly, then, we find Di Pietro and Spagnolo wonder out loud: “Should we rather say that, from the moment the *technical intervention is predominant* in respect to the presence of the spouses and procreation, even though it follows the conjugal act, it is dichotomised from union of persons, that is, GIFT is a form of negative artificiality? (122; emphasis added). But then, what is the measure of the alleged predominance?”

Preliminary Recapitulation

It would seem we have come full circle. We started out with the observation that certain types of reproductive medical interventions, whether aimed at preventing or achieving conception, are morally suspect when and because they involve technology. We also saw that not all technically driven reproductive interventions are immoral, for the Church deems permissible a whole array of technically advanced procedures, ranging from complex imaging procedures, to microsurgeries and hormonal stimulation. We next noticed that only those reproductive technologies appear morally suspect that are directly tied to the act of sexual intercourse itself. Then again, not all such technologies are morally suspect. When *contraception* is the objective, it would seem that *extracorporeal* technologies (such as a thermometer) are permitted, but *intracorporeal* technologies (such as a condoms, sterilization or hormones) are not. But if the goal is *procuring* conception, different lines are drawn: Now, *intracorporeal* technologies are permitted, such as hormonal interventions and even

⁷ An analogy that Watt could have invoked to hold on to the moral difference between both strategies – though she does not actually invoke it herself – could be the stance adopted by some Jehovah Witnesses that as soon as blood has left the body, it may not be re-inserted. Thus autologous blood transfusions are immoral, as would be re-injecting excess blood from a venous draw that is not needed for testing purposes without the needle ever having left the vena. But this objection rests on a very strict interpretation of biblical texts that prohibit the “consumption” of any blood. No such biblical literalism appears to undergird Watt’s reasoning.

intrafallopian gamete transfer, but only if the technologies do not cause any gametes to become *extracorporeal* during the fertilization process.

These divergent lines of reasoning, coming on top of the more fundamental question about the proper paradigm to be adhered to, cry out for clarification.⁸ Yet the final answer given by Di Pietro and Spagnolo – that technologies are moral when and because they are predominant – only leads us back to the starting question: What ARTs are morally suspect and why?

One possible answer, though not presented by any of the authors cited so far, is that the concerns while axiological, are not ethical at their core but esthetic.⁹ Earlier, we already saw the Magisterium expressing concern about technologies infringing on the cultural diversity around the globe. Although this concern has ethical ramifications, the value of culture, and hence of cultural diversity, is first and foremost esthetic. We next encountered the Magisterium's warning about the bond between farmers and their land being broken by the insertion of agricultural technologies and, by extension, the bond between the human being and his body by biomedical technologies. Here again, the concern about humankind losing ground, being uprooted, is certainly ethical. But at a deeper level it expresses an esthetic concern about the beauty of man's embodied being within nature, that is, about paradise on

⁸ To make matters worse – at least from a strictly logical perspective – the reasoning of many Catholic critics of ART is tarnished by unnecessary and indeed unjustified hyperbole. We already saw Msgr. Melina contend that in the context of ART parenthood is “*left to the mercy of technical manipulation*” (61, emphasis added). In the same set of conference proceedings, we find Watt arguing that ART involves “*a utilitarian sequence of events totally geared towards the child projected as the outcome of a technical procedure*” (20, emphasis added). Along similar lines Di Pietro and Spagnolo charge that in ART, “the role of the spouses is limited to *a cold and impersonal production of gametes*” (122, emphasis added). Human procreation thus has been placed “in the hands of *a technologist and his exploitation of it*” (De Dios Vial Correa and Sgreccia: 3, emphasis added). These accusatory qualifiers not only beg the question, but the very same concerns can also be raised vis-à-vis so-called “natural” forms of procreation. There too exists the risk of procreation turning into the production of a commodity, as when children are conceived for the purpose of economic gain, security in old age, survival of family name, or as an organ donor for an older sibling. Yet the Church does not prohibit “natural” reproduction merely because it can and indeed is all too often exploited.

⁹ Ethical judgments assess the value of human actions, typically expressed in terms of their goodness; esthetic judgments assess the value of existing entities, typically expressed in terms of their beauty. This presumption of a shift in axiological domains is admittedly tenuous and will require much more research. However, besides the arguments presented already, the following considerations appear to support the presumption. First, the source of the moral concern vis-à-vis ART is not the dignity of the child that is thus conceived. A child conceived through ART is itself equally created in the image of God and as such has the exact same intrinsic dignity as the child conceived through sexual intercourse. Indeed, it is precisely this fact that renders the existence of so-called “spare embryos” so morally abject. Hence, the source of the moral concern must *precede* the conception. Second, in the eyes of the Magisterium, the decisive moral factor does not appear to be the love between the couple that is conceiving. Such love does not justify IVF, nor does the real danger of rape justify the use of sterilization of an intellectually disabled girl. Third, the moral concerns are not evoked by the mismatch between biological and social parenthood (e.g., when donor sperm is used in ART). The Church considers adoption morally permissible, and not simply as the least of two evils (i.e., when the alternative would be abortion). Thus, the locus of morality must be the manner of conception itself. As Salzman and Lawler have already pointed out in reference to ART, “all that can be claimed with certainty . . . is that the act of sexual intercourse is not immediately responsible for procreation” (199). It is unclear, however, why this is *ethically* relevant.

earth. Within this context, the magisterial concern about the insertion of technology within human sexuality suddenly becomes much more understandable. Perhaps it is not so much that the technology itself is deemed immoral, though of course it can become so as can every human invention. Rather, it may be the beauty of human sexuality that is put at risk by the introduction of technology.¹⁰

Artificial Nutrition and Hydration

Human life as a gift from God is of immeasurable value. As stewards of this gift, rather than owners, it behooves us to nurture, guard, and protect human life, both our own and that of our fellow men. Nowhere has this obligation been more consistently, systematically, and structurally taken up than in the world of modern health care. With America now spending upwards of 18% of its gross national product on health care, of which a very large percentage is spent during the final months of patients' lives, we tend to forget that the average age of Americans around 1900 was only 37, and the odds of being healed did not increase a whole lot by paying a visit to the doctor – which was little wonder since physicians did not even consider hand washing an essential hygienic measure at the time. Only during World War II were antibiotics invented, and almost all life-sustaining interventions and technologies that are now a staple of modern hospitals and TV shows alike were only invented in the last half-a-century.

But these miracles of modern science and technology were not embraced by all; indeed, some of the most sick or traumatized patients were among their most vocal critics. Several of the now classic cases in bioethics involved patients whose very lives were being sustained by sophisticated life-sustaining treatments, and yet they refused continuation of these treatments. But the Magisterium remained by and large silent, occasionally voicing statements that confirmed its overall optimistic approval of life-sustaining biomedical technologies and their value as tools to protect human life. Even the staggering cost of health care did not appear to trigger much criticism, except for concerns about equal access to these expensive technologies.

Secular medicine, it should be emphasized, was equally hesitant to critically evaluate these new developments. Instead, it evaded its professional responsibility by readily adopting respect for patient autonomy as the single most important bioethical norm, thereby shifting the difficult task of assessing the value of these new life-sustaining technologies to patients and family members. The Magisterium, though accepting of the patient's own responsibility before God and hence the importance of respect for patients' autonomy, nevertheless feared a slippery slope towards euthanasia and apparently considered it safer to instead underscore the importance of accepting medical science and technology as means of sustaining life.

¹⁰ One analogy that comes to mind here – though an examination of its argumentative relevance to the issue at hand cannot be executed here – is the debate within the Church about the introduction of technology in the liturgy. These concerns date back at least to the initiation of the holy mass being broadcast on television. More recent debates involve the introduction of multimedia during the liturgy. While potentially serving an important purpose (e.g., providing translations in multiple languages so as to be more inclusive, or using captivating images from the history of Catholic art to literally illustrate theologically complex ideas), the introduction of technology is often experienced as distasteful, ugly, in short, as unesthetic.

Given these developments, those not fully familiar with church teachings on this topic may conclude that the Church requires the use of any and all life-sustaining technologies. But this is most certainly not the case. Although the Magisterium, as acknowledged earlier, has not formulated many specific norms about medical interventions at the end of life, a more prudential approach is regularly advocated. As early as 1957, we find Pope Pius XII reflecting on the recently developed technique of cardio-pulmonary resuscitation (CPR) and subsequent artificial ventilation. Though not reaching definitive conclusions, the Pope considered it morally permissible to cease such ventilation of a patient if “only automatic artificial respiration is keeping him alive” . . . “these forms of treatment go beyond the ordinary means to which one is bound” (328, 332). In a similar vein, the Congregation for the Doctrine of the Faith in its 1980 *Declaration on Euthanasia* stated: “One cannot impose on anyone the obligation to have recourse to a technique which is already in use but which carries a risk or is burdensome. Such a refusal is not the equivalent of suicide; on the contrary, it should be considered as an acceptance of the human condition, or a wish to avoid the application of a medical procedure disproportionate to the results that can be expected, or a desire not to impose excessive expense on the family or the community” (IV). The *Catechism* even uses the word “overzealous” to describe the unbridled use of life-sustaining interventions “that are burdensome, dangerous, extraordinary, or disproportionate to the expected outcome” (2278).

As the latter quote from the *Catechism* illustrates once more, except for very rare instances (such as Pope Pius XII’s 1957 address cited above), the few magisterial teachings on end-of-life care that have been issued do not specifically address the use of technology. They are concerned with medical end-of-life care in general. There is, however, one life-sustaining technological intervention that has gradually become a focus of specific and explicit moral guidance by church leaders: artificial nutrition and hydration (AN&H).

As early as 1991, the bishops of Pennsylvania argued that the use of a feeding tube is morally obligatory, insisting that it is not a medical intervention proper akin to dialysis, but instead a form of basic human care. The bishops argued, “every mode of taking in food and drink is, to some extent, artificial. This is the case whether we speak of the patient receiving parenteral feeding or the honored guest at a banquet for royalty – a banquet which observes every nicety of the most sophisticated table manners and requires a certain expertise in the recognition of all appropriate cutlery” (section on “Provision of Nutrition and Hydration”).¹¹ But this equation of a feeding tube and cutlery did not take a firm hold in Catholic medical-ethical doctrine until 2004 when Pope John Paul II addressed the participants at a 2004 conference on the persistent vegetative state with these words: “I should like particularly to underline how the administration of water and food, even when provided by artificial means, always represents a natural means of preserving life, not a medical act . . . Its use . . . should be considered, in principle, ordinary and proportionate, and as such morally obligatory, insofar as and until it is seen to have attained its proper finality, which in the present case consists in providing nourishment to the patient and alleviation of his suffering” (4).

¹¹ This analogy between AN&H and cutlery was repeated verbatim in the 1999-updated version of this document.

Although the level of magisterial authority of this papal address given at a scientific conference was relatively low (compared to, for example, an encyclical), a subsequent statement from the Congregation for the Doctrine of Faith (2007) confirmed this papal statement, thereby increasing its authority. In response, the United States Conference of Catholic Bishops adjusted its ERDs, issuing the fifth edition in 2009.¹² Whereas the fourth edition from 2001 had included the cautionary note that “hydration and nutrition are not morally obligatory . . . when they bring no comfort to a person who is imminently dying or when they cannot be assimilated by a person's body,” the new introduction to Part V contained instead the following statement: “While medically assisted nutrition and hydration are not morally obligatory in certain cases, these forms of basic care should in principle be provided to all patients who need them, including patients diagnosed as being in a ‘persistent vegetative state’.” In addition, the specific directive (58) pertaining to AN&H was changed accordingly, increasing the level of directiveness: Whereas the 2001 edition had underscored “a presumption in favor of providing nutrition and hydration to all patients,” the 2009 edition insisted that “there is an obligation to provide patients with food and water” with the exceptions listed later in the same paragraph.¹³

¹² The full text of the changed segments reads as follows (footnotes removed):

ERDs 4th edition, Part V, last paragraph: Some state Catholic conferences, individual bishops and the USCCB Committee on Pro-Life Activities have addressed the moral issues concerning medically assisted hydration and nutrition. The bishops are guided by the church's teaching forbidding euthanasia, which is ‘an action or an omission which of itself or by intention causes death, in order that all suffering may in this way be eliminated’. These statements agree that hydration and nutrition are not morally obligatory either when they bring no comfort to a person who is imminently dying or when they cannot be assimilated by a person's body. The USCCB Committee on Pro-Life Activities' report, in addition, points out the necessary distinctions between questions already resolved by the magisterium and those requiring further reflection, as for example the morality of withdrawing medically assisted hydration and nutrition from a person who is in the condition that is recognized by physicians as the “persistent vegetative state.”

ERDs 5th edition, Part V, last paragraph: The Church's teaching authority has addressed the moral issues concerning medically assisted nutrition and hydration. We are guided on this issue by Catholic teaching against euthanasia, which is ‘an action or an omission which of itself or by intention causes death, in order that all suffering may in this way be eliminated’. While medically assisted nutrition and hydration are not morally obligatory in certain cases, these forms of basic care should in principle be provided to all patients who need them, including patients diagnosed as being in a “persistent vegetative state” (PVS), because even the most severely debilitated and helpless patient retains the full dignity of a human person and must receive ordinary and proportionate care.

¹³ The full text of 58 in both editions reads as follows:

ERDs 4th edition 58: There should be a presumption in favor of providing nutrition and hydration to all patients, including patients who require medically assisted nutrition and hydration, as long as this is of sufficient benefit to outweigh the burdens involved to the patient.

ERDs 5th edition, 58: In principle, there is an obligation to provide patients with food and water, including medically assisted nutrition and hydration for those who cannot take food orally. This obligation extends to patients in chronic and presumably irreversible conditions (e.g., the “persistent vegetative state” who can reasonably be expected to live indefinitely if given such care.(40) Medically assisted nutrition and hydration become morally optional when they cannot reasonably be expected to prolong life or when they would be “excessively burdensome for the patient or [would] cause significant physical discomfort, for example resulting from complications in the use of the means employed.”(41) For instance, as a patient draws close to inevitable

It is an ongoing debate whether the 2004 address by Pope John Paul II constitutes a departure of earlier church teaching on AN&H or only a further explication of the same instruction (see, for example, the contributions to the 2008 volume edited by Tollefsen). What matters here foremost is how this intervention is understood. Whereas the ERDs did and still do label the intervention as a “medical” intervention, John Paul II in his 2004 presentation insisted that “the administration of water and food, even when provided by artificial means, always represents a natural means of preserving life, not a medical act.”

Not only do some authors overlook or simply brush away the differences between orally consuming a meal and AN&H, as does May in his defense of the 2004 papal address; not only are they explicitly judged to be morally irrelevant, as illustrated by the 1991 statement of the Catholic Bishops of Pennsylvania; the differences are denied outright by John Paul II: Surgically opening the abdominal wall and intestines, inserting and fixating a plastic tube, hooking this tube up to a machine, which then pumps into the patient’s body a mixture of water and nutrients that has been prepared in a distant pharmaceutical factory, while the patient is lying in a lonely hospital bed with a nurse occasionally checking whether the machine is still working, is considered the same as a husband preparing a special dinner for his wife to celebrate her birthday, with dishes that she particularly savors, setting a festive table, serving her with tenderness, and then sitting down with her to jointly enjoy the meal.

This equation of a medical technology with a shared meal has three very troublesome consequences. First, it renders it possible for caregivers to provide nutrition and hydration to patients without having to make the extra effort of creating experiences that are as close as possible to a true shared meal. There is no need to ask the patient what foods he likes or find out what flavors really please him; there is no need to serve a meal in a way that is pleasing to the nose, eye and palate alike; there is no need to sit down with the patient while the patient eats, or even to assist the patient in eating. One can simply insert a feeding tube and turn one’s attention to another patient in need of care. No doubt, those advocating that AN&H is to be administered in virtually all situations will forcefully deny that one may thus abandon the patient. But as a matter of fact, this conclusion follows logically and the temptation to thus abandon the patient is real.¹⁴

Granted, the Church’s defense of the obligatoriness of AN&H is not rooted in the significance of a shared meal in human life. One finds no reference to the Wedding at Cana or the Last Supper in the magisterial defense of AN&H. Rather, the focus is on the physiological impossibility for the human organism to remain alive in the absence of adequate nutrients and water, and the warning symptom of starvation that the body may

death from an underlying progressive and fatal condition, certain measures to provide nutrition and hydration may become excessively burdensome and therefore not obligatory in light of their very limited ability to prolong life or provide comfort.

¹⁴ That this temptation is real, even for very caring and compassionate providers, became clear to me when an occupational therapist revealed during one of my lectures on this very topic that it was common practice at her care facility to exclude pupils who were tube-fed from the common meals, using that time instead for some other care intervention.

generate as it runs low on these essential chemical building blocks. This, then, brings us to the second problem. For what is true physiologically of nutrients and water is true as well of oxygen. No human can remain alive in the absence of an adequate supply of oxygen, and the warning symptom that the body generates when it runs too low on O₂ and high on CO₂, that is, dyspnea or suffocation, is far more traumatic than hunger. If it is not permitted to let a patient die as a result of a shortage of nutrients whenever we have technology readily available to administer such nutrients into the digestive track where they can be absorbed, then the same is true of an oxygen shortage, and we hence must use a ventilator to pump oxygen into the patient's respiratory system where it can be absorbed. It would be as immoral to withdraw a ventilator (while palliating the symptom of dyspnea) as it would be to withdraw a feeding tube (while palliating the symptom of starvation). And if the administration of nutrients, water, and oxygen is imperative because those are all necessary chemical building blocks, then so is the removal of toxic chemical waste from the body. Hence, dialysis now becomes imperative as well. If a percutaneous endoscopic gastrostomy tube is analogous to banquet cutlery, then dialysis is analogous to bathing a patient and hence a nonmedical intervention as well. And yet, neither ventilation nor dialysis are considered non-medical forms of interpersonal care by the Magisterium that may only be forgone in highly exceptional circumstances.

Third, since AN&H is a technology that is actually inserted into the body, the difference between the natural body and artificial additions is annihilated. The umbilical cord and feeding tube have become one and the same. Such a denial of the difference between the natural and the artificial reinforces the view, dominant in the medical sciences at least since De La Mettrie published his *l'Homme Machine* in 1748, that the human body is but a complex machine. This, in turn, reinforces the temptation already identified above to let machines do what machines seemingly can do more effectively and efficiently.

We thus find ourselves faced with another remarkable paradox. Let us grant, as Di Pietro and Spagnolo have insisted, that “the generative act . . . is not a vegetative activity . . . ; it is not solely a biological act . . . From the gifts of the persons springs forth the gift of life: a gift that transcends and transfigures the biological fact . . .” (122). Why then can the act of sharing in a meal, which God's earth has given and human hands have made into a celebration that transcends the mere biological, be reduced to a simple succession of technical interventions? If the role of the spouses shall not be “limited to a cold and impersonal production of gametes” (Di Pietro and Spagnolo: 122) and “the beginning of the life of an individual human [placed] in the hands of a technologist and his exploitation of it” (De Dios Vial Correa & Sgreccia: 3), then the dying patient should not be rendered hostage to medical technology and care givers not reduced to managers of life-sustaining machines. If it is enough for a couple to engage in a loving embrace and tender intercourse, knowing that their rejection of ART will cause their sexual intercourse not to result in new life, then it should also be enough for the husband of a patient with advanced dementia to tenderly spoon feed his wife but a single bite of her favorite ice cream, knowing that his rejection of AN&H for his wife will mean that her life will end soon. Otherwise, we are at risk of exchanging “medicine at the service of the individual's total well-being” for “medicine marked by technical and organizational efficiency,” the very exchange Pope John Paul II had warned against four years prior to his 2004 address (2000b: 3).

Final Recapitulation and Conclusions

In this exploration of the Church's ethical assessment of biomedical technologies, we have relied heavily on a distinction which Drane proposed in 2002 between the medieval paradigm that technology is morally sound when and to the extent that it mimics nature, and the early modern paradigm that technology serves humankind's call to dominate, guide, and even transform nature. It is the latter paradigm that appears to have undergirded the Church's generally optimistic teachings on new technological inventions, including the many biomedical technologies developed in the past 75 years.

Drane, in contrast, is far less optimistic in his assessment: "Given what history reveals to be a chronic myopia when predicting the negative consequences of scientific and technological change, the idea of humans remaking the world may strike some people frightening" (30). But he is not alone. Only two years earlier, John Paul II had already expressed his grave concern over the emergence of "an irresponsible culture of 'dominion' . . . with devastating ecological consequences." The Pope went on to insist that God's assignments to humankind to "fill the earth and subdue it; and have dominion over the fish of the sea and over the birds of the air' (Genesis 1: 28) . . . entrust the earth to man's *use*, not *abuse*. They do not make man the absolute arbiter of the earth's governance, but the Creator's 'co-worker': a stupendous mission, but one which is also marked by precise boundaries that can never be transgressed with impunity . . . [B]iotechnologies . . . must be submitted beforehand to rigorous scientific and ethical examination, to prevent them from becoming disastrous for human health and the future of the earth . . ." (2000b: 4).

These cautionary comments notwithstanding, it is quite remarkable that for all of the Church's reflective, prudential, and meticulous ethical assessment of and guidance about an array of issues in health care, one looks in vain for a detailed and comprehensive assessment of biomedical technologies. It is only in the area of reproductive medicine that different technologies are scrutinized. Unfortunately, this scrutiny does not appear consistently executed, as we have seen. And it remains altogether unclear whether the rejection of some types of reproductive technologies but not others is ultimately grounded in concerns about the technologies qua technologies.¹⁵

The narrowly focused concerns voiced about certain ARTs are easily outstripped by the Church's wholesale acceptance of biomedical technologies in all other domains of medicine, from neonatal intensive care units to neuroimplants and nanotechnologies, and from dialysis to diagnostic imaging and defibrillators in daycare centers. Following the 2004 address by Pope John Paul II, moral theologians, Catholic bioethicists, and other commentators have vigorously debated the morality of AN&H. But even this debate has not led to a more comprehensive reflection on biomedical technologies as such. If anything, such a reflection appears to have become even less likely after Pope John Paul II's insistence that a feeding tube is not actually a technological intervention but a non-medical form of basic human care.

¹⁵ Note, for example, that the Church's main document *On the Regulation of Birth* does not specifically address technology as such. In fact, the word nowhere surfaces in this encyclical. The adjective "technical" is used once, and the adjective "artificial" four times in this 7,000 word document (Paul VI 1968b).

This dearth of careful reflection on the role of technology in contemporary health care is most unfortunate. For one, the burgeoning field of health care is in desperate need of bioethical reflection that moves beyond the important but narrow focus on such topics as clinical case consultation, patient autonomy, or reproductive rights, and instead submits to a careful ethical reflection the very concepts, foundations, structures, systems, and developments in contemporary health care.

But there is a second and far more urgent reason for the Church itself to undertake a careful, critical and comprehensive reflection on technology in general and biomedical technology in particular: The challenge it presents to the very phenomenon of religion. As early as 1966, Pope Paul VI, quoting the important Vatican II document *Gaudium et Spes – Pastoral Constitution on the Church in the Modern World*, had already cautioned: “In man’s own interests, the Church desires at all costs to save that ‘ability to contemplate and to wonder’ to which a purely technical civilization would be in danger of attaching little value. Above all does she fear, like a mother solicitous for the true good of her children, ‘that man, confiding too much in modern discoveries, may even think that he is sufficient unto himself and no longer seek any higher realities’” (120). A decade later, the Pontifical Academy of Sciences echoed these concerns when it concluded that “technology and industry are responsible for having almost eliminated in the Western World the inclination and the very aptitude for contemplation, so greatly does the myth of production absorb the energies and the time of western man. It is important that among those people of the Third World who still have the contemplative ability there should be established a proper relationship between technology and nature, so that the artificial does not suffocate the natural but preserves and perfects it so as to enrich it for the enjoyment of the spirit” (2007: 23).

Whereas Paul VI and the Pontifical Academy of Sciences voiced concern about technology crowding out humankind’s ability to wonder and with it space for faith and religion, neither appeared to have noticed that technology was becoming the very focus of humanity’s wonder, and thus assuming the place of faith and religion. To explain this point, Caiazza’s comparison between the steam engine and laptop is helpful. Whereas the steam engine, symbol of the early industrial revolution, might have been awe inspiring, its workings were easily explainable to any reasonable person. In contrast, the modern computer “remains a mystery even after inspection of its innards,” known and knowable only to a small enlightened elite, much like the priests of ere. And yet, computers are now all around us, in virtually every product we buy, every means of commuting and communicating, every mode of learning, building, healing, caring, even dying. Thus, “our personal environments have become so much the result of technological manipulation that when we reflect on them we perceive the creative power of human scientists, whereas in earlier times when we reflected upon nature we could see the creative power of God” (18).

Caiazza does not specifically address biomedical technology, but Reuter does. Reminding the reader that biomedical technology is widely considered to be among the most important and most promising of all, Reuter concludes, “it is considered *necessary* for further societal development and the establishment of public health, to the extent of fulfilling a quasi-religious function” (12). Biotechnology is believed to provide the key to health, happiness, and eternal life. In short, it has taken on salvific status.

In much the same way as it was utterly pointless in the seventeenth century for the Inquisition, the forerunner of today's Congregation for the Doctrine of Faith, to try holding on to an unmoving earth at the center of the universe, so it would be pointless to dismiss technology offhand, as Gandhi once did: It is at the center of our twenty-first century universe and it is what moves everything. The domain of health care is no exception. But by uncritically buying into, and indeed embracing biomedical technology wholesale, the Church *nolens volens* also buys into the values that are embodied therein. And thus we find modern biomedical technology becoming a moral guide of the Magisterium, instead of vice versa.

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