BIOTECHNOLOGY AND THE GIVENNESS OF THE GOOD: POSING PROPERLY THE MORAL QUESTION REGARDING HUMAN DIGNITY

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"In the future we will laugh at chance."
(Goethe, *Faust*)

I.

(1) It is difficult to exaggerate the depth, subtlety, and comprehensiveness of the challenge presented to human culture in biotechnology/bioethics today: in vitro fertilization; embryonic-pluripotent stem cell research; cloning; the nature and origin of gender/sexual difference. At stake is the integrity of the human being as *born* not *manufactured* and as naturally apt in his or her bodiliness for the expression of gift.

(2) *Veritatis Splendor* states that the problems now facing Christian morality not only involve specific teachings but reach to the very foundations and nature of the moral life. The problems have their origin in patterns of thought "which end by detaching human freedom from its essential and constitutive relationship to truth" (n. 4). Paragraphs 46–50 discuss this detachment in terms of a division, or extrinsicism, between freedom and nature or, more precisely, between freedom and human nature in its bodiliness.

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Thus the encyclical affirms "the unity of the human person, whose rational soul is *per se et essentialiter* the form of his body" (n. 48). Given this unity of body and soul, "the person, by the light of reason and the support of virtue, discovers in the body the anticipatory signs, the expression and the promise of the gift of self, in conformity with the wise plan of the Creator" (n. 48).

Further: "The natural law thus understood [in terms of the person's "unified totality"] does not allow for any division between freedom and nature" (n. 50). Indeed, a doctrine informed by such a division "revives in new forms certain ancient errors which . . . reduce the human person to a 'spiritual' and purely formal freedom" (n. 49). It "ends up treating the human body as a raw datum devoid of any meaning and moral values until freedom has shaped it in accordance with its design. Consequently, human nature and the body appear as presuppositions or preambles, materially necessary for freedom to make its choice, yet extrinsic to the person, the subject and the human act. Their functions would not be able to constitute reference points for moral decisions, because the finalities of these inclinations would be merely 'physical' goods, called by some *premoral*" (n. 48).

This argument of *Veritatis Splendor*, which is to say, especially, the sense of the body bearing "the anticipatory signs, the expression and promise of the gift of self," is aptly recapitulated and

developed in what Pope John Paul II terms the "nuptial attribute" of the body.[1]

(3) The idea of the human body as merely "physical," or "premoral," is a main feature of the "worldly" or cosmic order assumed at the origins and in the dominant practices of modern science and technology.

The premoderns approached science and technology[2] in the spirit of imitation of (or participation in) a nature or cosmological order given by God or the gods (cf. Plato's *Timaeus*). Consistent with this approach, the premoderns conceived space, time, and motion primarily in terms of quality (e.g., movement was most fundamentally teleological movement toward God); causality primarily in terms of internal ("interior") forming and finalizing acts, and indeed in terms of a mutual (if asymmetrical) influence of whole and parts (cf. Aristotle's *De Anima*). Further, those in the Aristotelian tradition recognized that these terms of quality, interior causality, and wholeness differed specifically in their meaning in the transition from physical to biological or organic and in turn to human levels, even as the latter remained in natural community with the former.

All of this implies that, for the premoderns, the given order of things was good, and the goodness of things was first given. Christians deepened this understanding of the convertibility (unity within distinctness) of being and the good in terms of the doctrines of creation and redemption. The upshot was that the order of the world, the world in its given order, was not "premoral" but "moral": fraught with meaning and significance for man, even as man was key for the meaning and fulfillment of the world—the world and man both understood in relation to God. The order of the (physical and biological) world constituted an inner reference point for morality.

Indeed, as Hans Urs von Balthasar emphasizes, holiness as realized in the great saints up through Aquinas and Bonaventure

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[1]John Paul II, "The Original Unity of Man and Woman," in *Theology of the Body* (Boston: Pauline Books and Media, 1997), 63.

[2]The term "technology" of course stems from the Greek, *JXP<O*, "art" or "skill." "Technology" is thus by definition a matter of the artificial or "man-made." Our question bears on the relation that ought to obtain between what is made by human beings and what is given by nature or the natural order of the cosmos.

was understood to include a dynamic for integration of the entire "worldly" or cosmic *order* of things.[3]

The moderns, in contrast, conceive science and technology first in terms of power and domination. The purpose is to control nature in order to "improve man's estate" (Bacon, Descartes). Consistent with this approach, the moderns conceive space, time, and motion primarily in terms of abstract quantity (for example, motion is now reduced to the mechanics of a local motion [Galileo, Newton] that Aristotle and Aquinas would have understood as a kind of "violence"[4]); causality in terms of external force (mechanized efficient and material cause, to the exclusion of formal and final cause), and indeed in terms of a unilinear direction of causal influence from parts to whole, the latter now representing merely the sum of the former. Further, the moderns account for the biological-organic and the human in terms of the physical conceived mechanistically—or, insofar as life and human life elude such an account, they are assumed rather to be "nonnatural."

This modern shift implies that the given natural order of things is not good, and that the goodness of things is not first naturally given. Being is drained of its original or constitutive goodness. This is referred to by some scholars as modernity's "neutralization" of the cosmos.[5] But as some of these same scholars also recognize, this term is somewhat misleading, since the cosmos is not merely neutral but in fact originally not-good. Which is to say, nature becomes good only insofar as man now intervenes and renders nature good.[6] The convertibility of *verum*, *bonum*, and *ens*

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[3]See, for example, his "Theology and Holiness," in *Explorations in Theology*, vol. 1: *The Word Made Flesh* (San Francisco: Ignatius Press, 1989).

[4]See Simon Oliver, "Motion According to Aquinas and Newton," *Modern Theology* 17 (April 2001): 163–199; here, 186–187.

[5]Rémi Brague, *The Wisdom of the World: The Human Experience of the Universe in Western Thought* (Chicago: University of Chicago Press, 2003). Cf. also Charles Taylor, *The Sources of the Self: The Making of the Modern Identity* (Cambridge, Mass.: Harvard University Press, 1989).

[6]The German-American philosopher Hans Jonas has shown the significant sense in which the moderns slip here into a kind of "Gnosticism." See his "Gnosticism, Nihilism, and Existentialism," reprinted in both his *The Gnostic Religion: The Message of the Alien God and the Beginnings of Christianity*, 2nd ed., enlarged (Boston: Beacon Press, 1991), and *The Phenomenon of Life: Toward a Philosophical Biology* (New York: Delta Books, 1966).

characteristic of the premoderns becomes in the moderns a *verum/bonum quia factum* (Vico).

The point, then, is that the cosmos in modernity is not neutral but on the contrary "*premoral*": nature or cosmological order no longer provides an inner reference point for morality. In the characteristic assumptions of modern science and technology, the world is approached as meaningless "stuff." The order of such "stuff" is not-good and is thus unworthy of "theory" (wonder or contemplation or "obedience"), and acquires goodness only insofar as it becomes an *instrument* of what is—and can only be, by virtue of modernity's separation of body/physicality and spirit/interiority—an originally indifferent and purely formal human freedom and intelligence.[7]

In terms of the view of Balthasar mentioned above, the "worldly" or cosmic order in the modern era need—and indeed can—no longer be *integrated* into the call to holiness, becoming rather a matter of indifference except, again, as an *instrument* of the will (voluntarism). This purely "instrumentalist" approach to the

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[7]It is important to stress that the point being made here does not at all imply denial that the practices of the modern scientific community are often much better than the inner logic of modern science as sketched in the preceding paragraphs and as articulated in formative thinkers like Bacon and Descartes. Researchers could not even begin an experiment without assuming that there was an order to be uncovered in the reality before them; and that such uncovering involved "obedience" to that order. If researchers do not put nutrients in the culture medium, for example, the cells will die; and researchers therefore must "obey" the reality of the cells in accord with the features and "needs" of the latter. Furthermore, this fidelity to given reality cannot but imply at least some minimal sense of mystery and hence wonder. And so on. It is extremely important to see this: indeed, unless the researcher's activity affirms some such sense of obedience and wonder and mystery (even if minimally and unconsciously), the kind of dialogue between philosophers (and theologians) and scientists envisioned by this article and noted later could never really be initiated, let alone sustained.

Furthermore, let us make clear that our argument regarding mechanistic (bio)science means not at all to deny the value of mechanical technologies *tout court*, which would be ludicrous. Nor, a fortiori, does it deny that physical things have ineliminably mechanical properties! The purpose of the argument is simply to clarify the nature of the *principled* limit of mechanism in accounting for the being and behavior of cosmic entities, and thereby to bring into relief why it is important to recognize this limit, especially in the case of organic-human entities.

cosmos (coincident with voluntarist piety) was greatly intensified in America under the influence of Puritanism.[8]

(4) Criticisms such as these regarding the ordering principles and methods of modern science/technology are typically set aside today as at best arcane, in light of modernity's evident successes in enhancing human health and comfort and in reducing suffering—through medicine and medical technology, for example. Modern science, in other words, has "worked," and this "practical" criterion is taken to suffice, a priori, to render moot any critical scrutiny of science and its method(s) in their constitutive order as such. Moral questions as a matter of principle are deflected away from the question of the cosmological/cognitional *order* embodied *in* scientific technology, toward the question of how this technology is *used* or *applied*.

What it is crucial to see, however, in light of the earlier comments, is that such a deflection *changes the nature of the moral question*. It reduces morality as it bears on science and technology to a form of *positivism*. Insofar as moralists grant the order of nature and of knowledge as assumed in modern science and technology, they—*eo ipso*—lose the non-arbitrary "foundation" *in* nature and knowledge necessary for raising the moral question in its proper sense at all, that is, as a reasonable matter integral to the truth of things. The modern order of intelligence as sketched above implies denial of the *givenness* of nature as ("transcendentally") true and good (and beautiful!), and its replacement by the idea of *verum/ bonum/ pulchrum quia factum*. Indeed, this order implies loss finally of the very notion of nature itself, the *ratio* of which includes both nature's givenness and its immediate-intrinsic demand on us (that is, both its being-given and also, by virtue of being-given, its being-good). We have, in other words, the replacement of premodernity's being/nature and the good with modernity's "fact" and "value": "fact" is now an (empirically-accessed) mechanism whose intelligibility is elicited through human control, while "value" is the human will's imposition on "fact" of what is now only nonnaturally "good"—i.e., "good," not as given first-intrinsically by nature, but only as posited, instrumentally-arbitrarily, by man.

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[8]See my "Religion and Secularity in a Culture of Abstraction: On the Integrity of Space, Time, Matter and Motion," *Pro Ecclesia* 11 (Winter 2002): 76–94.

(5) Now moralists today, against this background and in the face of developments in biotechnology, characteristically focus on the moral object and end of a given practice. They focus, for example, on whether/when an entity (moral object) is human and thus on the dignity and rights of such an entity. They seek to circumscribe the human area within which biotechnological experimentation is not to be permitted, while seeking to form an effective consensus with representatives of science, government, and the broader culture that respects these limits.

It is of course essential to emphasize the uniqueness of the human and, accordingly, to draw a clear line respecting human dignity beyond which biotechnological experimentation must cease; and, further, to seek community with members of the broader culture relative to this clear line.

The crucial point, however, in light of the foregoing observations, is that we take account of how the "premoral" conception of "nature" operates in the dominant practices of biotechnology, and how these as a consequence—in their very character *as* practices—tend toward an attenuation-unto-definitive-deferral of the ethical question in its proper—that is, reasonable—form, and just so far toward deferral of any community that would be reasonably formed around this question.

Again: ethicists are right to defend the unique dignity of the human person by virtue of his intelligence and freedom (spiritual "faculties"), and thereby, further, the unique dignity of the human body, that is, by virtue of the person's "unified totality." They are right that the human person/body is not "premoral": here the good is unconditionally given.

But that is just the fundamental question forced by the foregoing considerations: who or what now grants—i.e., gives—being in this unique instance its original-intrinsic goodness, and on what basis?

The question is intensified by the fact that biotechnology, as conceived at least by its most benign practitioners, aims not to deny but on the contrary to enhance the distinct dignity (good) of the human. Its compassionate purpose is to eliminate or reduce the chance-like behaviors of (human-biological) "nature" that are responsible for disease and suffering. Its purpose, in other words, is to realize more fully the conditions under which (even human) being in its proper sense—from within the dominant modern horizon—demands recognition as good in the first place. For, on

the modern view, (even human) being can be good only, and precisely, on the way to its being enacted and enhanced by humans (*bonum quia factum*).

(6) Thus, unless ethicists question modernity's "premoral" conception of nature, their affirmation of an intrinsically given, non-instrumental human good can only be a form of question-begging. Such an affirmation can only take the form, properly, of a nonnatural assertion resting *eo ipso* on a kind of "moral intuition-ism"— on an appeal, that is, which does not give an account of itself (also-) intrinsically in terms of what is given *naturally-anteriorly to*, and thus *transcendently of*, human agency (consciousness).[9]

Note, again, that our claim here presupposes that the good emerges in an "exceptional" (distinctly moral) way with respect to human being, and hence does not deny that distinctly moral consciousness emerges first and properly in man. The issue concerns rather the nature of and warrant for that distinct good. The issue, *vis-à-vis the horizon of modernity*, is precisely whether/in what sense the good that emerges exceptionally in the case of human being, and moral awareness of which occurs first in human consciousness, is first and exclusively-intrinsically given *by* humans.

Our simple but basic contention in this context, then, is that, unless moralists challenge modernity's "premoral" nature and just so far not-naturally-given good, there can be, *relative to modernity* (e.g., to the practices of biotechnological science), no non-arbitrary grounds for introducing a non-instrumental good, moral or otherwise. In the end, either *bonum* (including the human *bonum*) is so originally qua *ens* or it is so originally only qua *factum*.

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[9]It is important to understand that the problem with "nonnaturalism" or "moral intuitionism" as an ethical theory is not its emphasis on the irreducibly distinct character of moral consciousness in relation to nature and "natural" consciousness, and hence not its—rightful—criticism of "naturalism" as an ethical theory. Again, the problem is not, strictly, with nonnaturalism's insistence on the non-inferential character of morality in relation to nature. The problem, on the contrary, is that nonnaturalism construes the rightful *distinctness* between the moral good/moral consciousness and nature/natural consciousness as an *extrinsic relation*, and, accordingly, takes "non-inferential" to be synonymous with "not-related-intrinsically-to." The present article, in contrast, understands the relation between moral consciousness and natural consciousness as a distinctness-within-unity—a distinctness, in other words, that occurs within and just so far presupposes an intrinsic relation between the two.

What I am terming a (nonnatural) appeal to "moral intuition" begs this question and, in so doing, remains locked within the very horizon that exposes the content of that moral intuition for what it now is: an arbitrary value imposed on a world of constitutively "dumb" (scientific-technological) facts.

(7) It follows further in this context that moralists' search for consensus with representatives of the broader scientific culture will now tend as a matter of its own inner logic to be deflected away from genuine or intrinsic community—i.e., community sustained in and by truly reasonable dialogue—and toward "community" constructed by other, more external, means, such as managerial techniques and procedural politics.

II.

(8) What lessons, then, are yielded from the foregoing considerations, if we would pose the moral question regarding human dignity in a truly reasonable, non-question-begging, fashion, relative to modern biotechnology? The main lesson is bound up with three fundamental claims, each of which can be given only a summary description in the present forum.

(9) (i) First of all, the question is what constitutes the original meaning of and connection between the given and the good, which must be answered in a way that does not beg just what is at issue: namely, whether/in what sense the given and the good exist in some significant sense anterior to human agency. The question of what constitutes the distinctly human, and the exceptional human good, in other words, must be resolved in terms of what finally makes being itself be and be good.

In a word, we must ponder the nature of being in its original givenness and the nature of givenness in its original being.

In Thomistic terms, the question is that of the meaning of *esse* in relation to *ens*, now framed expressly in terms of the givenness of that relation: in terms of whether/in what sense being (*ens*) bears within itself the effect or sign of its being-given in a benign or generous sense, and thus of its being-good already in its original order as such.

In relation to Christianity, the question is whether being-given in the benign sense demands a Creator and indeed finally a Redeemer: that is, One who, in giving being, at once intends

somehow to sustain that being in its natural giftedness in the face of (possible) evil.

It is being's originally given order as both sign and fruit of its being-given in a benign or generous sense that enables us—and indeed alone ultimately "requires" us—reasonably to affirm being in its original and natural givenness *as gift*. The givenness of being indicates a *giftedness* that is, *eo ipso*, giving of itself: being, as gift of a transcendent giver, thereby becomes a participant in the giving of the giver. Participating in the giving of a generous giver, being thus becomes itself innerly generous or creative and hence good: *bonum est diffusivum sui*.[10]

For this reason being is also inherently mysterious. Being finds itself always-already "inside" its innerly creative-generous source, and thus inside an origin that (ontologically) "precedes" and thus transcends it, even as being at once *participates* in this *original creativity and generosity*. It is this inherent diffusiveness of being in its origin—of *esse* (*Esse*), and of *ens* as participant in the generosity of *esse* (*Esse*)—that renders being intrinsically and ultimately mysterious. The nature of being in its inner structure and operations, in other words, is such that it is never, in any given instance (as a whole or in its parts), exhaustively a matter of a power mechanically conceived—a power, that is, not conceived as irreducibly generous and self-diffusive.[11]

The premoderns of course offer many different accounts of the nature of being's original givenness. Most of them agree, however, in understanding that reasonable affirmation of being's original givenness as good requires recognition of being's being given in some significant sense by a benignly active transcendent order—of God or gods. In other words, for these thinkers the

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[10]To be sure, there are many further elements that need to be sorted out for a fully integrated notion of the good: why the good in the sense defined is inherently a matter of attractiveness; why it requires in each being an interior *telos*: end or finality; why it presupposes the idea of form or order, and so on. Each of these elements I take already to be implied in the argument outlined in this paragraph, but fuller development must await another occasion.

[11]In this connection, cf. especially the work of Kenneth Schmitz in the matter of recovery of a metaphysical sense of interiority, and of causality as generous: for example, *The Gift: Creation* (Milwaukee: Marquette University Press, 1982).

ontological question must ultimately take a theological form:[12] it cannot be resolved back into a simply anthropological form, since what is most pertinently at issue is what counts in the first place as a worthily-given demand *upon* the human.

(ii) It is premodernity's sense of being as gift and as mystery that prompts and "requires" wonder as the most fundamentally reasonable, and indeed at once most fundamentally ethical, way of relating to given reality.

Wonder is the reasonable recognition of the mysterious, self-diffusive origin of beings that *reaches to the heart of beings* in their wholeness and in each of their parts through the course of their existence.

Wonder so understood is not merely "subjective" ("mystical," "romantic"). On the contrary, wonder before the world in its givenness (conceived as a giftedness already and in principle giving of itself) is just so far already a form of participation *in* that givenness. *Wonder is but the subjective-cognitional form of participation in the objective nature of being as gift.*

Thus it is wonder that sees the world as it really is (-given), in its truest nature as such, and, in that act, sees at once (also) that the world as it really is (—given) invites—immediately "demands" from the whole of each of us—a "yes": a "*fiat*" that takes in, thus "permitting" and itself bringing to completion, the world's original and abiding being *and* worth as such.

Summarizing (i) and (ii), then: objective being-as-gift, together with its subjective-cognitional correlate, being-as-wonder, indicate what it means for the cosmos to be and to be known, and at once to be good and to be known as good. As primordial, this order of being and cognition is necessarily recapitulated in each act of being and cognition, and hence in each act of doing and making insofar as these latter involve (embody, express) acts of being and cognition. The summary point for present purposes is thus that being, as inherently diffusive, and hence both mysterious and good, cannot be exhaustively accounted for (at the outset or at any point

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[12]By "theological" here, I mean simply an understanding of being that includes some account of what ultimately is, of an ultimate-transcendent order, and indeed accords this ultimate being or transcendent order agency with respect to cosmic reality. Given present limits, I bracket the question of the sense in which theology in this—or in its most proper—sense presupposes a divine revelation, or grace, or supernatural faith.

along the way, in whole or in any of its parts) in terms of mechanical power, which is to say, in terms of a causality or causal knowledge conceived as external-"blind" force and hence in the limit deterministically.

(iii) With this we come to a decisively important third claim: the ontological notion of being-as-gift and being-as-wonder, which is to say, of being as diffusive, hence inherently mysterious and good, is inextricably bound up with the tissue of cosmological claims noted at the outset regarding the nature of space, time, matter, motion (physical order), and indeed of life (biological order) and of human life (anthropological order). Premodernity's ontological-theological presuppositions regarding being as gift generate, come to expression in, and are themselves in turn required by premodernity's distinctive notions of quality, of interior—and just so far non-mechanical, non-material, and non-deterministic—forming and finalizing causes (in accounting for the behavior of even non-human entities);[13] of the (consequently) inherently mysterious nature of the being and behavior of an entity, at once in its wholeness and in its "parts"; of the inherent (natural) goodness of—and consequent respect (wonder) to be accorded to—each entity: all of these features understood in analogical proportion to the ways in which they are manifest, distinctly-respectively, in physical, biological-organic, and anthropological contexts.

It is beyond our purposes here to show how this is so in any detail. The burden of our reflections is simply to draw attention to the indissoluble mutual link between cosmological claims and deeper, more comprehensive, theo-ontological assumptions. And to point out further in this context that, just as premodernity's notions of matter and motion, of (human) life and its worth, of causality and the like presuppose (and in turn are required by) some significant affirmation of being as gift and of knowledge as wonder, so do modernity's contrary notions of matter and motion, of

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[13]Cf. Schmitz, *The Gift*; and also his presidential address to the American Catholic Philosophical Association, "Immateriality Past and Present," *Proceedings of the American Catholic Philosophical Association* (1978), 1–15. The interiority indicated here, as our argument throughout makes clear, is to be understood as a metaphysical interiority, actualized in analogically different ways in physical, biological, and anthropological beings.

(human) life and its worth, and of causality likewise presuppose some significant denial that being is gift and knowledge, wonder.

These distinct premodern and modern mixes of cosmological and ontological-theological claims come to expression in, and are presupposed by, correspondingly distinct notions of what it means to know and to control and indeed to make, in whole or in part: of the sense in which knowing, controlling, and making are possible, and good. Biotechnological practices, accordingly, involving as they do knowledge, control, and manufacturing, just so far involve—are mediated by and indeed *themselves instantiate*—a definite mix of philosophical (ontological) cosmology, anthropology, and theology.

(10) What we are suggesting here has been implied throughout the foregoing. But we are now prepared to see the fuller and more precise meaning of the suggestion.

Recall the issue as framed earlier, which was that of when and how the ethical question should be posed with respect to modern (bio)science and (bio)technology: whether it needs to be posed already with respect to scientific-technological practices in their dominant constitutive *order* as such, or only with respect to how or for what purpose these are *used* or applied—for example, relative to the human person.

We have seen that this deflection of the moral question away from biotechnology's intrinsic order and toward its application just so far presupposes that this order is neutral with respect to the nature of morality properly conceived: that the dominant practices of biotechnology are as such empty of any (pre)judgments affecting the nature of morality. Such a deflection, in a word, presupposes that biotechnological practices are in the first instance "premoral," matters of a purely technical or empirical "know-how" that becomes morally significant only after the "fact"—for example, when exercised vis-à-vis a human moral object.

However, what is construed (a priori) as the moral emptiness of biotechnological practices as such, we can now see, already expresses a mechanistic nature and knowledge, which in turn *ontologically* imply a nonnatural life/human life and nonnatural good/

human good,[14] and an absent God (god):[15] each of these and all of them together presuming and expressing a denial of being and knowing as first and most properly gift and wonder.

A putatively purely technical or empirical biotechnological practice, in short, is, precisely *as* a practice, (also) a distinct (albeit often unwitting) *theory* of nature and knowledge (mechanism), which in its turn implies a distinct theory of the universe in its entirety: of (human) life and its goodness (nonnaturalism), and of God (a-theism).[16] Acceptance of a practice so conceived, therefore,

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[14]To be sure, as indicated earlier, (human) life and the (human) good, insofar as they are accounted for (reductively) in mechanistic terms, are appropriately termed "naturalistic," *insofar as they are accounted for (reductively) in mechanistic terms*. The point here is simply that, insofar as (human) life and the (human) good elude such a mechanistic account, they thereby—given the modern reduction of nature to mechanism—cease to be matters of nature at all: which is to say, they become nonnatural.

[15]Absent, that is, in the sense that a mechanistic understanding of nature by definition takes no account of the ontological effect of a transcendent giver *in* things, in their original and abiding constitution and reality as such. (Recall here, for example, the creature's constitutive relation to the Creator, which is just so far *in* the creature and thus *makes a difference to* the creature in its *original and abiding being and acting as such*—in ways we have indicated throughout in terms of what may be called an organismic ontology.)

[16]We use the term "a-theism" rather than "atheism" here to emphasize that the theory of the universe implied by a mechanistic nature in the first instance indicates an absent God and not a simply non-existent God. But the question of course is whether a God who is absent from, or remains simply external to, the being and activities of nature can in the end suffice as truly—which is to say, as an infinite and generously creative—God at all.

It is interesting to recall here that two of the most formative thinkers of modern science, Descartes and Newton, in contrast to many conventional scientists today, understood that our ideas of physical nature finally invoke, and presuppose, some account of the nature of God and of his creative activity in relation to the universe. Their respective accounts of God, however, consist in (quite differently conceived) amalgams of mechanism and voluntarism; and such accounts thus entail exactly the mechanistic notions of nature that (whatever the respective original intentions of these two authors to the contrary, and thus however ironically) inform the contemporary view that nature, and scientific-technological theories and practices with respect to nature, are as such innocent of any implications regarding God. (Cf. in this connection Simon Oliver, "Motion According to Aquinas and Newton" [fn. 4 above]; and also Michael J. Buckley, S.J., *At the Origins of Modern Atheism* [New Haven: Yale University Press, 1987].)

Our point, then, is that contemporary scientists/technologists who claim that their

logically requires, and in the end can only permit, an ethics consistent with such a theory.[17]

Acceptance of biotechnological practice as purely empirical, in a word, thus permits only an arbitrarily asserted human-moral good, one which by definition has no roots in the truth and goodness of nature and natural knowledge, and which, consequently, makes no non-arbitrary demands on those who would be reasonable (given the dominant horizon of biotechnology).

Hence our simple but far-reaching conclusion: ethicists can properly pose the moral question in relation to any given biotechnical *practice* only insofar as they come to terms (dynamically-simultaneously) with the ontology regarding physical nature and knowledge, and in turn human life and goodness, and God that, willy-nilly, and however unconsciously, gives that practice its most basic and abiding *form*. Ethicists can pose the moral question in its rational integrity with respect to biotechnologists only insofar as the dialogue they undertake with the latter bears an inner dynamic for coming to terms with this (always implied) ontological form of their practice.

III.

(11) What such a dialogue indicates may be illustrated in part in terms of Stanford Professor William Hurlbut's proposal before the President's Council on Bioethics regarding "Altered

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theories and practices are empty of implications regarding the nature and creative activity of God thereby confirm, not the emptiness of such theories and practices, but only their ignorance of the latter's (continuing) implication of (some variant of) the mechanist/voluntarist God defended explicitly by Descartes and Newton. That is, these contemporary scientists/technologists assume that the idea of an absent God—a God who is absent from the (inner workings of the) world—is not an idea of God at all, whereas it is in fact merely the (unnoticed) idea of a mechanist/voluntarist God.

[17]The crucial term here is *logically*—or better ontologically—requires: it remains quite possible, of course, that one's ethics with respect to biotechnological practice will be guided by *intentions* of the most benevolent sort. Our point is merely that these intentions remain inconsistent with—are ontologically undermined by—the notions regarding the nature of the universe that are necessarily implied in such practice insofar as the latter is understood mechanistically.

Nuclear Transfer [ANT] as a Morally Acceptable Means for the Procurement of Human Embryonic Stem Cells."[18]

(i) Professor Hurlbut puts the ANT proposal forward as a possible "technological solution to our moral impasse" (December 2004, p. 1).[19]

(ii) Hurlbut ties his proposal expressly to an interpretation of what is termed "systems biology," which offers a "view of an organism as a living whole, a dynamic network of interdependent and integrated parts. If severed from the whole, these partial subsystems may temporarily proceed forward in development, but without the larger environment of their organismal system, they will become merely disorganized cellular growth. ANT proposes that small (but precisely selected) genetic alterations will allow us to harness these subsystems of partial development, apart from their natural organismal context, in order to produce ES [=embryonic stem] cells" (December 2004, p. 8). Elsewhere he states that "an individual human life cannot be described atemporally, but must be recognized in the full procession of continuity and change that is essential for its development" (January 2005, p. 4); and further that

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[18]This proposal was presented to the Council on 3 December 2004. Its burden is to propose a procedure—what is termed Altered Nuclear Transfer (ANT)—that produces embryonic or pluripotent stem cells, but would do so without producing a human embryo. The proposal thereby seeks to resolve the conflict between those who support embryonic/pluripotent stem cell research and those who oppose such research because—insofar as—it involves the destruction of human embryos. For further description of this proposal, see the articles by Roberto Colombo and Adrian Walker in the present number of *Communio*. In our own discussion, we will cite by date from the following (versions of) papers by Professor Hurlbut: "Human Cloning and Human Dignity: An Ethical Inquiry" (July, 2002); "Altered Nuclear Transfer as a Morally Acceptable Means for the Procurement of Human Embryonic Stem Cells" (Text presented at the conference, "The Stem Cell Debate in the United States of America and the Federal Republic of Germany," at The Catholic University of America: October, 2004); "Altered Nuclear Transfer as a Morally Acceptable Means for the Procurement of Human Embryonic Stem Cells" (Presentation to The President's Council on Bioethics: December, 2004); "Altered Nuclear Transfer as a Morally Acceptable Means for the Procurement of Human Embryonic Stem Cells" (January, 2005), forthcoming in the April, 2005 issue of *Perspectives in Biology and Medicine*.

[19]The phrase "technological solution to a moral problem" was also used by other members of the President's Council during their public discussion of Professor Hurlbut's proposal.

"a living being has a continuous unfolding existence that is inseparable from its emerging form. The form is itself a dynamic process rather than a static structure. In biology, the whole (as the unified organismal principle of growth) precedes and produces the parts. It is this implicit whole, with its inherent potency, that endows the embryo with its human character and therefore its inviolable moral status" (January 2005, p. 5). Referring to Thomas Aquinas, Hurlbut states: "When the overarching integration of essential parts and functions is not present (or, as in the 'brain dead' donor, no longer present), there is no living organism and therefore there is no being with human moral status" (October 2004, pp. 3–4).

(iii) Hurlbut makes reference to the fact that biotechnology's "goal is to produce the more advanced cell types of tissues, organs, and possibly even limb primordia. Producing such complex tissues and organs may require the cell interactions and microenvironments now available only through natural gestation" (2002, p. 5); and then adds in a footnote: "Natural development proceeds within the context of a highly refined spatial and temporal niche of organized complexity of positional cues, signal diffusion and cell-cell contact between cellular lineages of diverse types" (2002, fn. 13).

(iv) Hurlbut says that, "[w]ith new tools from cytology to synthetic biology, we are gaining control of not just component parts and their partial trajectories of growth, but the very principles and dynamics of organismal systems" (January 2005, p. 15). In "our new appreciation of systems biology," we can see "how even an alteration in a single gene can affect the entire balance of an enormous network of biochemical processes within the cell" (January 2005, p. 16). Elsewhere he states that "[e]ventually we may understand the biochemical factors that can transform a somatic cell to a pluripotent state. But while the ultimate goal of ES cells is the direct nuclear reprogramming of an adult nucleus, it may be many years before our scientific knowledge and control of cellular factors will make this approach feasible" (December 2004, p. 8).

(v) Concluding his presentation of ANT to the President's Council, Hurlbut sums up: "At this early stage in our technological control of developing life, we have an opportunity to break the moral impasse over stem cell research and provide moral guidance for the biotechnology of the future. This may require a constructive refinement of some aspects of moral philosophy, together with

creative exploration of scientific possibilities, but any postponement of this process will only deepen the dilemma as we proceed into realms of technological advance unguided by forethought. We must initiate the cooperative dialogue that is essential to frame the moral principles that can at once defend human dignity and promote the fullest prospects for scientific progress and its medical applications" (December 2004, p. 13).

The texts cited here are selective. Hurlbut develops the issues embedded therein further in the papers from which they are taken, and no doubt would agree that they need fuller explication than can be offered there, given the papers' limits. We wish to suggest that the texts as cited nevertheless suffice to indicate philosophical assumptions that remain, however unconsciously and despite his explicit intentions to the contrary, ambiguously mechanistic; to suggest that this unintended mechanism shapes at critical junctures both his description and his moral evaluation of what is taking place in the ANT procedure. The present forum does not permit us to develop a sustained and complete argument in support of this claim. Our comments, rather, will be limited to sketching the sorts of questions that are indicated with respect to his description and his evaluation of the ANT procedure, given the problem of mechanism as we have outlined that problem in earlier sections of this article.

Regarding (i): Any suggestion that ANT might provide a "technological solution to our moral impasse" is problematic. There can be no unqualifiedly technological solution to the moral problem that ANT seeks to address because in fact there is no unqualifiedly technological solution to *any* human problem. Technology in and of itself is already-also an ontological form, and hence there can be an adequate technological solution only insofar as that solution embodies an adequate ontological form. Of course, in a sense Hurlbut himself recognizes this, insofar as his own description of the ANT proposal draws explicitly on a tissue of philosophical judgments—partially exemplified in the statements we have cited. But the question, whose implications become clearer in light of the four comments to follow, is whether these (partially developed) philosophical judgments suffice to remove—or, on the contrary, to reinforce—the mechanism (implicitly) reflected in his description and defense of the proposal.

Regarding (ii): It is of course true that an individual human life cannot be described simply atemporally, that the form of a

living being is in a significant sense "a dynamic process" that must be "recognized in the full procession of continuity and change that is essential for its development." Nevertheless, the wholeness proper to an organism implies an "all-at-once" character: the coming-into-being of an organism cannot itself be exhaustively temporally-processive, else there would never come a point at which we could speak properly of an organism's *being* at all. We would be unable to qualify *what* it was in the first place that was in the process of becoming. Furthermore, this "all-at-once" character implies an immediate "downward" causality, such that the parts of the organism are now properly understood as parts *of* the whole, or indeed temporal *unfoldings*, or *stages*, of something that is "already" ("essentially") there. Hurlbut's various descriptions of ANT remain decisively ambiguous on this point. Indeed, it is precisely his blurring of the distinction indicated here—the distinction, that is, between unfolding or manifesting organismal traits and being an organism—that permits him to describe the result of the procedure as a non-embryo, a description that constitutes the heart of his proposal.[20]

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[20]Let us stress that the issue here is not that Hurlbut does not see the importance of a distinction between an organism in its wholeness and in its parts. Thus he states, for example, that "a living being is more than the sum of its parts, and the parts are dependent on the integrated unity of the whole" (January 2005, p. 16). Further, as the text cited in (ii) indicates, he clearly acknowledges the whole as "the unified organismal principle of growth," and states that such a whole "precedes and produces the parts," that it is "this implicit whole, with its inherent potency, that endows the embryo with its human character." Our suggestion, however, again, is not that he fails to distinguish between a whole and its parts, but rather that he fails to recognize the serious ambiguity of his various statements relative to the nature of that distinction. The question is whether he has a sufficiently clear sense of an organism's *originally-actual* (i.e., in a crucial sense "all-at-once" and not merely "implicit") *wholeness*, such that we would then be warranted in speaking of the developing parts as parts *of* the organism. Without a clear sense of this *originally-actual wholeness*, one invariably (logically) tends to conflate "downward" causality (which moves from whole to parts) and "upward" causality (which moves from parts to whole). An adequate conception of an organism—i.e., a conception of organism that would avoid a "vitalist" dualism on the one hand and a mechanistic reduction on the other—requires the simultaneity (within distinctness) of both senses of causality. Hurlbut fails to take integral account of this crucial distinction in his description of what is produced by ANT.

To put the matter in Thomistic terms, Hurlbut fails to articulate adequately the distinction between act and potency as operative in defining the nature of an

Regarding (iii): (Bio)technological procedures can never yield cell interactions and microenvironments that reproduce exactly the environment of natural–organic–gestation. The language often used here is that of "functional equivalency." But the pertinent point is that a mechanical environment, however refined, can at best only approximate a natural, or organic, environment. A mechanical environment, in other words, could *function identically* to a natural-organic environment only if it *were* the latter. Failure to see this indicates a failure to grasp the difference between a living entity/body and a mechanistically-conceived non-living entity/body. Natural gestation, in a word, is different as a matter of principle from a mechanism, even an extraordinarily-subtly complex one.

The point, then, is that efforts to mimic organismic events technologically are not merely empirical matters, as though, were we able successfully so to mimic, the result would be the same organismic events produced by nature. This begs the question: for such an understanding of what is possible—and of what is thus sought by such efforts—is already in*form*ed by a mechanistic ontology that blurs the difference between organic behavior and (even complex and subtle) mechanical behavior, and thereby assumes just what is denied by recognition of that difference—to

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organism. This distinction, rightly understood, requires an absolute priority of act coincident with a relative priority of potency. On a Thomistic understanding, in short, an organism's becoming is always-anteriorly a *being*-becoming.

Further, then, and related to the foregoing comments, Professor Hurlbut rightly stresses "the importance of evaluating products of fertilization and nuclear transfer not simply by visual observation but also against the molecular signature that characterizes natural embryos" (January 2005, p. 15). This qualifier regarding the importance of the molecular signature is *necessary*, but it does not yet *suffice* to account for the "all-at-once" wholeness constitutive of the organism in its proper meaning. The molecular signature is a necessary criterion because an organism in its wholeness is essentially expressed and embodied in its "parts" (i.e., the wholeness is not "vitalistic" in nature); but the molecular signature itself does not suffice to account for the organism in its wholeness because the organism in its wholeness does not reduce to its "parts," even when the latter are now understood as finely organized bits of information (i.e., the wholeness does not reduce to the sum of even very subtly complex mechanistic parts).

For fuller discussion of the philosophical-empirical issues raised here, see Adrian Walker's "Altered Nuclear Transfer: A Philosophical Critique" in the present number of *Communio*.

wit, that these two behaviors *can* converge to the point of *real* identity, identity *in being*.

Or the argument at any rate is that the two behaviors can converge to the extent of counting *effectively as* such an identity, because and insofar as any remaining difference between the two behaviors, at least in the long term and given sufficient technical progress, would be empirically indiscernible. As long as the technological events did really approximate the natural events, so the ontological assumption runs, the consequences—e.g., any possible harmful effects induced by the technological environment—would and could only be negligible, or, if serious, then empirically measurable as such. Note, however, how mechanistic assumptions continue to inform what counts (can count) as significantly harmful here: for "empirically measurable" means discretely identifiable—and indeed in the relatively short run—and it is just the reduction of "significantly harmful" to what can be known in this manner that is (*inter alia*) called into question by a properly organismic ontology.

The point here can be illustrated with reference to in-vitro fertilization (IVF). When biotechnologists mechanically engineer the fertilization and subsequent implantation, it is commonly assumed that they are doing no more than aiding the natural process that normally brings these about. And indeed the result, in many cases, is an organism that successfully implants and eventually comes to birth.

However, we need to take note of the original environment of such an organism—the environmental factors operative with respect to the organism in its original constitution. The environment that is partially constitutive[21] of the organism in the case of IVF is mechanical in nature: the movements effecting the fertilization and in turn the implantation are those primarily of external

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[21]It may seem question-begging to use the language of "constitutive" when describing the environmental factors involved in generating an organism via IVF, since the conventional assumption regarding the IVF procedure, already suggested in the text, is that this procedure changes only the *external* conditions whereby an organism is brought into existence, thus leaving intact the organism that comes into being. But of course that is just our point: such an "external" or "extrinsicist" reading of the environmental factors involved in IVF already assumes the mechanist understanding whereby causes are reductively "effective"—that is, remain outside and on the surfaces of that in relation to which they exercise their agency.

force, even if subtly administered. The significance of this begins to become clear when we recall that the sort of causal activity and movement characteristic of organic beings is in the first instance interior[22]— interior activity, that is, not as exclusive of external-mechanical activity, but as always anterior to and immanent within such mechanical activity and thus as always already having formed (i.e., rendered more interior–subtly gentle and responsive, etc.) the character of the latter.

The point, then, is that this difference in the activities or movements whereby an organism first comes into being *makes a difference to* that organism. Indeed, what takes place in an IVF procedure, notwithstanding what are often the compassionate intentions of its practitioners, is the replacement of an originally interiorly integrated environment with an originally externally manipulated environment, a replacement rightly understood as a loss of a constitutively "domestic" environment—literally of the kind of *home*—required by/for an organic being.[23]

To be sure, and once again: the IVF procedure is sometimes successful. That is, an organism sometimes succeeds in being implanted and in coming to birth, and this would seem to confirm in an empirically conclusive manner that the organism has suffered no significant harm or loss of organic integrity. Such an interpretation, however, again, imports the very mechanistic terms for measuring harm that are in question. It assumes that any harmful effect to an organism produced by IVF, were it significant, would have to be discretely identifiable as such in the relatively short-term, or in any case be able at some point to be disaggregated precisely as a function of discretely identifiable mechanical factors in its original environment. But the pertinent point, given the non-mechanistic philosophy sketched in our earlier comments, is that, while any significant harmful effects would in principle have an

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[22]Indeed, insofar as this interior activity and movement is properly conceived in terms of "form" and "finality," we see that the causal activity and movement of organisms are in the first instance matters of meaning and purpose! Or, in the case of the human body, matters of love: cf. John Paul II's notion of the nuptial body.

[23]The terms "domestic" and "home" are not merely metaphorical; they are properly analogical: see the discussion in fn. 26 below.

essentially empirical manifestation,[24] these effects might nevertheless be (empirically) discernible only long-term and indeed, given the reality of an organism as a dynamic mutually causing and caused whole-in-parts and parts-in-whole, not in a way that can be cleanly disaggregated finally in terms of one or more discretely identifiable causes at all.

Regarding (iv): The preceding point is strengthened when we remain cognizant of the intrinsic limits of knowledge and control as argued earlier in terms of a non-mechanistic understanding of nature. We will never gain complete control of the component parts or partial trajectories of growth or the principles and dynamics of organismal systems. Nor will we ever know precisely how a single gene affects the entire balance of an enormous network of biochemical processes within the cell. To be sure, if scientists succeed in advancing their knowledge in these respects, we will know that they were so to advance (as the philosopher Etienne Gilson used to insist, if something is actual, it is possible!). Furthermore, as Professor Hurlbut rightly points out, scientists *have* greatly increased their knowledge of, and consequently their control over, the parts and the wholes of biological systems. The relevant point, however, is that, granting this advanced and ever-increasing knowledge and control, scientists/technologists for all that have not yet succeeded in giving an exhaustive account of the behavior of *anything* in whole or in part.[25]

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[24]In point of fact, of course, there have been many manifestations of problems associated with IVF, with respect to both the woman and the child: hormonal stimulation of the woman may increase the risk of cancer or other problems; "ovarian hyperstimulation syndrome"; higher rates of miscarriage, stillbirth, and neonatal death; of ectopic pregnancies; greater likelihood of the child's being born with spina bifida and a particular heart defect known as "transposition of the great arteries"; risk of lower birth weight; higher rates of multiple pregnancies with their greater risk of birth defects, and so on (see Robin Marantz Henig, *Pandora's Baby: How the First Test Tube Babies Sparked the Reproductive Revolution* [New York: Houghton Mifflin, 2004], 235–244). On the conventional (and Henig's) reading, however, such problems are matters mostly of technical knowledge and skill that are likely to be resolved over the long term. But whether and to what extent this is so is just what must be examined in light of the distinction between mechanical and organic environments.

[25]This point has often been made by critics (such as physicist David Bohm and biologist Richard Lewontin) with respect to mechanistic biologists (such as Jacques Monod and Richard Dawkins), or again by critics (such as Noam Chomsky) with

The crucial consideration, in other words, arises in terms of the nature and significance of the (current) inability to give exhaustive explanations of, and hence exhaustively to control, the behavior of any entity in whole or in part. Which is to say, it concerns the reasonableness of and warrant for the scientist/biotechnologist's "faith" that they eventually *will* reach such exhaustive knowledge or control, to the extent at least that any remaining lack of knowledge/control will be negligible: that efforts mechanically to engineer an entity in whole or in part will be skillful enough that they will do no great harm to the organisms being engineered. And, once again, biotechnologists point to their ever-increasing empirical successes as justification for such a "faith."

However, this sort of faith in (increasingly) exhaustive knowledge and control of the behavior of organisms, or indeed this appeal to empirical evidence offered in justification of such a faith, begs the question of the difference between mechanisms and organisms, already in favor of mechanisms.[26] It overlooks the (possible) significance of the dynamic, and deeply-internal, mutual relation of whole and parts characteristic of an organism, assuming that nature is rather more like a (Cartesian) machine capable of being broken into "clearly distinguishable bits and pieces, each of which has a determined causal relation to the movement of other bits and pieces"; that an organism, in other words, "can be broken into pieces whose identity as pieces is unproblematic and which have a clear chain of causal connections with each other in [re-]

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respect to mechanistic psychologists (such as B. F. Skinner). But it is in any case worth noting here how (as David Bohm, for example, well understood) the claim that anything has been exhaustively explained, in whole or in part, would entail a changed understanding, not just of that whole or that part, but of the nature of the universe! It would call into question the nature of ultimacy—of whether/in what sense what is ultimate is an infinite and generous creator, etc.—and in so doing would, *eo ipso*, call into question the nature of every entity whose being and acting is affected by the nature of ultimacy—which is to say, the nature of every entity.

[26]Which of course themselves do not in the strict sense exist, for reasons indicated throughout this article. Even machines, in other words, cannot be accounted for in exhaustively mechanical terms—for example, as a simple sum of isolatable parts. This of course does not mean that a living being, with its more deeply interior relations, does not differ essentially from a non-living entity; only that this essential difference is to be conceived analogically (real-unity-within-ever-greater-difference).

producing the properties of the whole."[27] The above faith, further,

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[27]Richard Lewontin, *The Triple Helix* (Cambridge, Mass.: Harvard University Press, 2000), 71. As Lewontin puts it, "The organism does not compute itself from the information in its genes nor even from the information in the genes and the sequence of environments. The metaphor of computation is just a trendy form of Descartes' metaphor of the machine. Like any metaphor, it catches some aspect of the truth but leads us astray if we take it too seriously" (ibid., 38). See also id., *Biology as Ideology*: *The Doctrine of DNA* (New York: HarperCollins, 1991); R.C. Lewontin, Steven Rose, and Leon J. Kamin, *Not in Our Genes* (New York: Pantheon Books, 1984). We should note that the notion of causality sketched in the present article, which we have termed "organismic" (and which in fact could be helpfully developed further in terms of a kind of "dramatic" theory, given the reality of an organism as a dynamic mutually causing and caused whole-in-parts and parts-in-whole) differs significantly from Lewontin's own constructive account of causality, which he terms "dialectical." But this is a matter for discussion elsewhere.

A book that contrasts sharply with the work of Lewontin, and helps to draw out in helpful ways our own argument, is Oxford University professor Richard Dawkins' *The Selfish Gene* [=*SG*] (Oxford: Oxford University Press, 1989 [1976]) (see also his *The Extended Phenotype* [New York: Oxford University Press,1982]). Dawkins argues that organisms are "robot vehicles blindly programmed to preserve the selfish molecules known as genes" (*SG*, vii). The organism is merely the DNA's way of making another DNA molecule. The phenotype is "the bodily manifestation of a gene, the effect that a gene . . . has on the body, via development" (*SG*, 235). Though this may seem an extreme view to some, it in fact only makes explicit what is already implied in Descartes' (putatively) "dumb" material substance. The Cartesian substance's lack of inner reference to anything outside itself, and its supposed neutrality with respect to human meaning, are in fact but alternative ways of saying that such a substance is *ontologically self-centered*: in the sense that it bears no originally-constitutively ecstatic movement toward an other. Dawkins's book thus only makes explicit what remains implicit in Descartes, except that Dawkins now replaces the latter's single selfish substance with a collection of selfish bits and pieces.

This point helps us understand more clearly—by way of contrast—why the language of generosity we have used above to characterize the being and behavior of cosmic-biological (as well as human) entities is not merely metaphorical, but truly analogical. Once we see this, we can see further why it is not merely a metaphorical but a truly analogical use of language to refer to the "domestic" or "home" microenvironment of an organism.

Further, then, Dawkins' conception of (isolatable) genes as selfish provides warrant for what he sees as our capacity in principle to provide a deterministic account of organic behavior, just as our own conception of being as inherently generous or self-diffusive provides warrant for our non-deterministic account of organic behavior.

We should note that Dawkins argues that the determinism he intends is finally of a statistical sort, and that the selfishness he affirms is not of the short-sighted sort (*SG*, 267–268). But it is beyond our purposes here to show the sense in which this fails to bring him beyond the objectionable burden of his claims on both points.

We make these brief references to Dawkins, then, because he helps to clarify

fails to question whether an organism, with its more "interior" nature and environment, might be more vulnerable, or vulnerable in less immediately discernible ways (than a mechanism), with respect to technological interventions–especially those taking place in an organism's original-constituting microenvironment. In short, it begs the question of the ways in which even a subtle or apparently negligible—that is, empirically indiscernible (not discretely identifiable)—lack of knowledge or control might in fact, now or over the long term, result in the manufacture of significantly disabled or destructive bio-entities—e.g., human monsters.[28]

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another—basic—sense in which the supposedly neutral "nature" of the dominant mechanism is non-neutral: mechanism's "dumb" "nature" is in fact an ontologically self-oriented, as distinct from self-diffusive, nature.

[28]Cf. in this connection the following pertinent comments of Hans Jonas: "What we are talking about is the planned creation of new forms of life by direct intervention in the molecularly coded hereditary blueprint of given species. This is not the same thing as the breeding of useful species of animals and plants, which has been practiced since the dawn of agriculture. That breeding operates through the phenotypes . . . .The natural variability of reproduction is used to obtain the desired characteristics from the original genotype by selection of the phenotypes over the generations. . . . This is artificially steered and accelerated evolution, in which deliberate stock selection takes the place of the statistically slow-working selection mechanism of nature . . . . Nevertheless, it is still nature which supplies the selection material. . . . The genetic connection with the wild form, the ability to be crossed back with the latter, is usually not broken. Man, in other words, is manipulating what the existing range of species makes available to him with the distribution of its mutant store and its further mutations.

"What is known as recombinant DNA technology is a very different matter . . . . What is happening is that at a single stroke, with a single step, a whole posterity of altered organisms, enriched by a new characteristic, is being introduced onto the stage of life by 'splicing in' alien genetic material into the chromosome package of a reproductive cell. We might call this process genetic surgery or gene manipulation or even nucleus re-building, all of which phrases express the element of mechanical skill, the extraneous handling of the innermost, the piecemeal reshuffling of the whole. At any rate, the process circumvents the *soma* and goes literally quite straight to the 'core'—the cell nucleus which contains in its molecular alphabet the causative 'information' for the cell's life performance and the constitution of its progeny. The altering of one letter, the interchanging of one word (=gene), the addition of a new one modifies the text and initiates a new hereditary sequence. Just this DNA rearrangement at the key point of life can now be contrived with the aid of microtechnology, and a newly introduced 'word' can be one taken from the hereditary text of a completely different organism. We are dealing, then, with applied nuclear biology. Like nuclear physics, this too leads to unknown, unpredictable territory, where undreamt-of treasures beckon and where

dangers lie in wait, which in their own way could be little less than those of applied nuclear physics" ("Technology, Ethics, and Biogenetic Art: Observations on the New Role of Man as Creator," *Communio* 11 [Spring 1985]: 92–107; here, 98–99).

Jonas' comments here prompt us, *inter alia*, to ponder the distinction between germline genetic engineering, on the one hand, and what he calls "somatic therapy," on the other. (1) Somatic therapy presupposes the relative maturity and integrity of an organ/organism already having developed in and through the environment provided by nature. Germline genetic engineering, on the contrary, presupposes precisely a mechanically manipulated environment at the beginning. Our argument highlights the significance of this distinction.

(2) Jonas' comments prompt us, secondly, to ponder the *different sense of time* operative in a phenotypic as distinct from genotypic intervention in nature, in bringing into being new forms of life. While phenotypic intervention does hasten what would be the normal time required by nature when left to its own evolutionary process, it nonetheless works *with* nature. Phenotypic intervention (e.g., "breeding") presupposes and thus respects the gradual unfolding of life proper to an organism. Genotypic intervention (e.g., "manufacturing"), on the other hand, takes place in "a single stroke," and hence as it were "timelessly": without regard for the "time-fulness" required by what comes to maturity or creates a new form of life organically. The difference here, in other words, is the difference between the time proper to a mechanism and that proper to an organism. Organic life "takes time" (an organism undergoes life, if you will) in a way that a mechanism does not: organic life involves a dynamic *internal* or *interior relation* between whole-in-parts and parts-in-whole that just so far presupposes a mutually internal *taking in* of whole-by-parts and parts-by-whole. This mutually internal taking in—required for and by the integration proper to an organism—is best termed an *ontological patience*. It is this ontological patience that signals the key to the difference between organismic and mechanistic time.

These short remarks demand much fuller elaboration. For present purposes, however, it suffices to suggest that the *notion of time*, for the reasons briefly noted, indicates another important perspective from which to evaluate critically the dominant mechanistic practices of biotechnological science.

(3) Elsewhere in the article cited here, Jonas states firmly that it is difficult to fault the aim of germline genetic engineering to eliminate the causes of defects, and acknowledges that such a practice, "like so much in technology, sets out with very acceptable objectives" (op. cit., 105). Yet, he says, "in a comprehensive balance, misgivings weigh heavily on the other side of the scale:

"1. [Genetic experiments at the origin of human life] are in themselves unethical. And, in the very nature of things, any intervention in the delicate control mechanism of a nascent life is an experiment, and one involving a grave risk that something might go wrong, resulting in a deformity.

"2. If a mechanical construction turns out wrong, we scrap it. Are we supposed to do the same with a biological reconstruction that turns out wrong? Our whole attitude to human misfortune and those afflicted by it would take a new, anti-humane direction.

"3. Mechanical errors are reversible. Biogenetic errors are irreversible.

It is important to remind ourselves here, again, of the relevance of the fact that the behavior of an organic entity remains intrinsically-finally mysterious—by virtue of the mutually internally related causal activities of whole-in-parts and parts-in-whole, and indeed by virtue of the inherently diffusive nature of these activities that is a consequence of the organism's gifted-being. The behavior of an organic entity is not mysterious because of some sort of "mystical" unknown lying still-simply beyond what is presently causally accessible. On the contrary, mystery is proper to organismically-conceived causality as such, and is thus integral to what counts as (possible and/or desirable) knowledge and control of any entity in the first place—in its beginning, in its end, and all along the way, in whole or in part. Mystery is not related inversely—and thus does not diminish proportionately—to progress in scientific knowledge and technical control. Rather, insofar as it is integral to what counts (can count) as such knowledge and control in each instance of same, mystery (thereby) indicates the (significant) sense in which knowledge and control, even in their greatly advanced and ever-advancing forms, remain innerly limited—the sense, in other words, in which knowledge and control *never* involve complete or simple *possession* of their object.[29]

"4. Mechanical errors are confined to the object actually involved. Biogenetic errors spread out from that object, as indeed it is hoped that the successes will also.

"5. In somatic surgery, there is a known inter-relationship between the transplanted organ and the rest of the organism. In genetic surgery, the way in which the transplanted gene will interact with other members of the chromosome whole is unknown and unpredictable, and may not become apparent for generations. [Cf. here also the comments of Richard Lewontin, in *Biology as Ideology*, 70.]

"6. By applying the technique as such to man, we would be opening the Pandora's Box of melioristic, stochastic, inventive or simply perversely inquisitive adventuring. . ." (105–106).

[29]It is useful, apropos of the embryonic stem cell research that sets the immediate context for our article, to remind ourselves that scientists themselves at the present time are quite limited in the claims they make regarding our ability to harness the capacities of ES cells (ESCs) for regenerative medicine. Thus they say, relative to the injecting of human ESCs into mice, that these experiments show "the capability of ESCs to produce a variety of tissues, but the results also highlight the complexity of the biological 'program' of tissue development that can unfold in different biological environments. These results also emphasize the abnormal, potentially neoplastic potential of ESCs when placed into unnatural environments.

"Major questions remain about the genetic or environmental factors in the body

Needless to say, these few remarks in connection with (iii–iv) require much more development than can be provided in the present forum. We have not chosen the IVF procedure as an example because we assume that Professor Hurlbut would defend this procedure. Nor do we necessarily assume that Hurlbut would disagree in principle with much of what we have proposed regarding the difference between mechanisms and organisms in (iii–iv). Our purpose is merely to question whether he has adequately integrated the substance and implications of this difference into his frequent (and sometimes passing) references to the capacity and progressive nature of technical knowledge and control. We suggest that he has not: that, on the contrary, he appears to leave the question of the limits of this knowledge, and of the control consequent upon such knowledge, open simply to an empirical resolution: that is, in the sense that he puts off questions regarding the nature and significance of these limits—regarding what sort of knowledge and control is possible and/or possibly harmful—until the point at which these involve application to a human-moral subject. Our suggestion is that Professor Hurlbut's way of proceeding here just so far implies an (unintended) participation in the conventionally mechanistic horizon whose problematic nature has been pointed out earlier, that is, in terms of how such a horizon always subverts in advance our capacity to assess properly the limits of technical knowledge and skill, *precisely-even* when this knowledge and skill are applied in the special case of the human-moral subject.

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that control the fate of ESCs and about the importance of different factors during the various stages of cell differentiation" (*Stem Cells and the Future of Regenerative Medicine* [Washington, D.C.: National Research Council, 2002], 34). Again: "[N]o one has yet demonstrated any in vivo reconstitution of an organ's function in either humans or experimental animals with cells derived from human ESCs. Moreover, ESCs in tissue culture give rise to a mixture of cell types all at once, and biochemical, tissue-culture, and molecular-biology techniques to control and limit differentiation require much further investigation" (35). "In addition to demonstrating the functional effectiveness of ESC transplants, it is necessary to identify and minimize, or eliminate, the risks that ESCs might pose" (36). "It is too early to tell, therefore, whether it will be appropriate to use human ESCs directly in regenerative medicine. A great deal obviously must be elucidated about how the body controls the differentiation of stem cells, and this has yet to be reliably reproduced in vitro" (38).

The burden of our argument is that we need to ponder the limits of knowledge and control as recorded here in terms of the distinction between mechanisms and organisms, and the peculiar risks inherent in these limits relative to the latter.

Regarding (v): This leads to our final question, which bears on the nature of the dialogue Professor Hurlbut envisions with scientists and biotechnologists. He is quite right to insist that we will face a deepening dilemma as biotechnology continues its ever-accelerating advances. Such advances, taking place willy-nilly, will follow a rightful direction only if thoughtfully guided. But of course that is just the point: Hurlbut recommends the "constructive refinement of some aspects of moral philosophy" coincident with a "creative exploration of scientific possibilities." The pertinent question, however, in light of the argument sketched in this article—and indeed especially in light of the preceding four questions—is whether, in so doing, he has come to terms adequately with the mechanistic ontological form that currently dominates these "scientific possibilities." Lacking a dynamic for dialogue with bioscientists regarding this mechanistic form, one begs precisely the neuralgic issue: to wit, what it truly means to "frame the moral principles that can at once defend human dignity and promote the fullest prospects for scientific progress"—can frame the former principles and promote the latter prospects, that is, in a manner *consistent with the truth and goodness of the order of being and knowing in their proper nature as such*.

IV.

(12) There can be no illusion about the magnitude, depth, and subtlety of the issues involved in the dialogue indicated here. The necessarily critically-constructive philosophical (and indeed finally theological) aspects of this dialogue, however, have nothing to do with "demonizing" science and technology, or denying the ever-present mechanical aspects of things. Nor does the (necessarily-also) philosophical character of the dialogue indicate an imperialistic intrusion on science and medicine in their rightfully empirical dimensions. Nor, further, does it mean that scientists need to become full-blown philosophers and philosophers full-blown scientists, which would result in the confusion of philosophy and science to the detriment of the proper work of both. Nor, finally, does it imply that every instance of conversation between philosophers and scientists need, without considerations of prudence, to invoke the full range of questions about the nature of the universe!

What the dialogue entails, rather, is just that: a dialogue, a genuine listening of each to the other, in accord with the other's proper-inner reasonings and practices and in light of ever-present considerations of prudence—including, for example, the demands for (possibly-imminent) policy-oriented (political) judgments. Bioethicists—philosophers and theologians—should understand that the needed dialogue will involve at its core efforts to uncover the meaning of an organismic, as distinct from mechanistic, understanding of the cosmos, that is, in recognizably scientific terms, and properly in terms of the behavior of the respective entities being studied. In light of the argument outlined in the present article, such a dialogue, from the side of philosophers (and theologians), is best initiated, and conceived, in terms of conversation with those theorists and practitioners of science who, precisely in their achievements *as scientists*, articulate a cosmological order—in terms, variously, of physical, biological, and human behavior, and of practices and technical interventions with respect to each behavior—consistent with a view of being as (analogically conceived) gift and wonder; with scientists, in other words, who show the fruitfulness, *precisely in scientific-technological terms*, of more integrated notions of non-organic and (human) organic nature.[30]

Nonetheless, even with these qualifications, the magnitude, depth, and subtlety of the dialogue that is called for remain. The warrant for such a dialogue, however, can be rightly measured only in terms of the magnitude, depth, and subtlety of what is at stake in the dialogue's outcome. At stake is the (ever more greatly) increased (physical) health and reduced (physical) suffering of human beings made possible through technical-medical interventions. But at stake also, precisely coincident with this concern to ease human suffering, is the dignity of the human being in his or her proper integrity relative to these interventions, which reach to the original-constitutive and hence most vulnerable environment of the human being, and by implication also to the human being's final meaning and worth.

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[30]The work of biologists and physicists like Wallace Clarke, Adolph Portmann, E. S. Russell, David Bohm, Michael Polanyi, Leon Kass, Richard Lewontin, and Charles Birch might be mentioned here—to name only a few more or less randomly, and not necessarily to imply our complete agreement with all of them or their complete agreement with each other.

We conclude with a comment regarding what is the deepest and most comprehensive horizon within which to understand the terms of what is thus at stake.

(13) The ontological question regarding being as gift/wonder is perhaps posed in the most sustained fashion in our time by Martin Heidegger. Heidegger, however, leaves the theological issue (as sketched in no. 9 above) insufficiently addressed, with the consequence that the be-ing (*Sein*) of beings oscillates between being a giver in a benignly ordered sense and being a "no-thing" (*das Nichts*) that in fact "nihilates" (*nihil*). Heidegger's sense of the primacy of *Sein*, in other words, has cosmological consequences:[31] in the end that primacy is such that it drains the nature and knowledge of beings of any principled-specifiable causal order, and thus of the order necessary for distinguishing genuine (true/good) appearances of be-ing (being) from the (false/evil) concealment of same. The consequence, in short, is an (ontological) vulnerability to nihilism of a mystical sort.

Now the immediate purpose of the present article has been to consider the implications of the prevalent tendency to deflect moral questions away from the cosmological-cognitional order embodied in bioscience, toward the latter's practical applications. Such a deflection, we have pointed out time and again, carries the presupposition that the being of nature is effectively "dumb," that it thus has its meaning and goodness only in terms of what is now an ineliminably ambiguous human *factum*.

What we wish to suggest in conclusion is that the failure, in dialogue with science and technology, to uncover the inherently "moral" dimension, or goodness, of being as such, precisely in its implications for the causal order of the cosmos, and (thereby) for the cognitional order of biotechnical science, leaves the practitioners of the latter open to what is in the end but a variant of Heidegger's nihilism. Such a failure, albeit from an opposite direction from that of Heidegger, similarly leaves the nature of being ambiguous in its original givenness, in its evidentiary character as such; and it (thereby) similarly affords no truly reason-

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[31]Cf. the comment of Hans Jonas: "No philosophy of nature can issue from Heidegger's thought" ("Heidegger and Theology," in *The Phenomenon of Life: Toward a Philosophical Biology* [New York: Delta Books, 1966], 235–261; here, 253, fn. 16).

able way of distinguishing between a good technological order or practice and an evil one.

To put the matter provocatively: just as Heidegger's *anti-technologistic* sense of givenness leaves him vulnerable to nihilism in a fascist form, modernity's *technologistic* sense of givenness leaves modernity vulnerable to nihilism in a liberal-democratic form. Heidegger's sense of the given does not permit one to affirm any instance of technology that could logically—from the point of view of reason, rightly understood—be termed good (as distinct from evil), while modernity's sense of the given does not permit one to reject any instance of technology that could logically be termed evil (as distinct from good). Indeed, when we take note of what is the decisively distinguishing feature of modern technology—namely, its ever-advancing capacity to manipulate the human being in his or her original-constitutive and most intimate, and hence most vulnerable, environment, or, again, its growing capacity to replace the human person's being born with being manufactured—we can see that liberal-technologistic nihilism, for all of its genuinely compassionate intentions and notwithstanding what is the very real progress of technology in reducing human suffering, may well be even more virulent in the long run than "mystical" or fascist nihilism.[32]

We are thus brought back to the question of what is at stake in coming to terms with the order embedded in contemporary biotechnology. The issue that needs most urgently to be faced is nothing less than whether biotechnology's ever-more sophisticated interventions with respect to the human being represent extensions, finally, of a nature imitating, and of the human person imaging, the diffusive-generous creativity of being/Being (and of God himself), or whether they represent on the contrary a significant inversion of such creativity. To the extent that the latter is the case, the prevalent ontological form of biotechnology can be said—again, notwithstanding its genuinely compassionate intentions and coincident with what is otherwise its genuine service to the elimination of human disease and misery—to be hastening what is quite rightly and literally termed the death of nature, a death that at once implies and helps to bring about the death jointly of man and of God.

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[32]Cf., for example, our discussion of Jonas' criticisms in fn. 28 above.

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