

# POPE JOHN PAUL II

## LECTURE SERIES IN BIOETHICS

### *THE BIOLOGICAL REVOLUTION AND THE MYTH OF PROMETHEUS*

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#### INTRODUCTION

Next to the scientific revolution itself, the biological revolution is the greatest of all the purely human revolutions thus far. I say "purely human revolutions" because the greatest of all revolutions was that affected by Christianity. But since the latter consisted of Christ entering human history, it was revolution by Divine intervention and therefore belongs in a class by itself. I shall, however, have occasion to advert to the significance of Christianity for the biological revolution later in this presentation. The magnitude of the biological revolution originates in the fact that it signals a decisive breakthrough in our mastery over *internal* nature. While the other revolutions, such as the Industrial Revolution, were confined in their influence to man's environment, advances in the biological sciences bring with them the promise of manipulating his own being even unto the point of manufacturing human beings in his own image. The generation of human life by in vitro fertilization will soon be a commonplace as well as will be the storage of frozen human embryos. Although other projects frequently discussed, such as recombining DNA, other forms of genetic engineering, and cloning remain very far from application to human beings, their very prospect confronts us with the question, "What Sort of People Should There Be?"<sup>1</sup> Speculations, however fantastic, such as the creation of computers with human brains (cyborgs) and computers with biological parts capable of replacing themselves,<sup>2</sup> are "thought experiments"<sup>3</sup> sufficiently fascinating to challenge our conception of human nature.

As we might have expected, secular humanism cannot conceal an enthusiasm for the biological revolution, despite expressions of concern from some of its advocates about mismanagement and violations of liberty. No doubt, the temptation to refashion man so that he will be perfect manifests itself today *genetically* as opposed to its former *political* manifestation. Classical political theory - e.g., as set forth by Plato, Aristotle, Augustine, and Aquinas - saw temporal society as the "second best state" whose task was to mitigate by law and custom human imperfection insofar as it asserted the impossibility of attaining perfect justice in this life.<sup>4</sup> But modern political theory, since Marsilius of Padua, has rejected as irrelevant to man's temporal political projects the supratemporal concerns of religion, such as heaven and hell. It was accordingly inevitable that modern political theorists should have found themselves with no alternative than that of seeking the ultimate reward and punishment in temporal society alone: human perfection will be attainable in this life or not

at all. Given this outlook, it is hardly surprising that biological manipulation, dangling before the world the rich promises of genetic engineering, should now vie with political control as the preeminent instrument for the eradication of “evil” from human conduct and for making man perfect.<sup>5</sup>

But the biological revolution has a more fundamental significance than as an extension of the ambitions of modern political theory. Nowhere is this significance more powerfully expressed than in the Myth of Prometheus. The common version of the myth tells of *Prometheus pyrphoros*, who stole fire (the symbol of culture) from Zeus and gave it to man. The other version, which probably had a different and later origin, tells of *Prometheus plasticator*, who creates man.<sup>6</sup> Obviously, the second version is simply a specific amplification of the aspirations expressed in the older version. The Promethean figure may be described as one who is constantly striving to unlock the secrets of nature and who refuses to acknowledge any limits to the human mind's capacity to understand them. Such an individual might even covet the knowledge of God. This rebellion against human limitation emerges quite clearly in Goethe's *Faust*. The afflatus for Faust's lifelong pursuit of learning was not wisdom but the desire to be like God:

I, the image of godhead, who thought myself near to the mirror of eternal truth, enjoyed myself in heaven's clear radiance and stripped of all mortality; I, more than a cherub, I, whose free strength already dreamed it flowed through the veins of nature and dared presume to enjoy the creative life of the gods - I must do penance for that.<sup>7</sup>

It would therefore be mistaken to categorize the Promethean figure simply in terms of expanding the frontiers of human knowledge, discovering the philosopher's stone, or even sharing the Divine wisdom. The Promethean *élan* drives some human beings to become creators of human life itself. Consider, for example, the homunculus aspired to by Paracelsus,<sup>8</sup> the creation of an homunculus by Wagner in Part Two of *Faust*<sup>9</sup> and the Frankenstein monster in Mary Shelley's novel, appropriately subtitled *The Modern Prometheus*.<sup>10</sup>

It is clear that the biological revolution expresses the Promethean myth in contemporary terms. It is Promethean not only insofar as it testifies to man's relentless striving to enlarge his knowledge but also insofar as it testifies to his desire to increase his domination over the universe - even into the creation of human life itself.

To be sure, the Promethean myth enshrines man's preeminence in nature, his nobility as a seeker of truth and self-determining agent. But we should not allow its positive side to blind us to its down side. The Promethean myth is a tragedy: Prometheus is monstrously punished for bringing fire and hope to mankind. Disaster ineluctably follows from the attempt to emulate God. Wagner's homunculus dashes itself to bits on the rocks; the Frankenstein monster enslaves and destroys its creator but only after inflicting suffering and death on innocent people.

But the Promethean need not be a tragic figure. Man's desire for increasing knowledge of and domination over nature are the springs of human progress. The Promethean tragedy presupposes a rivalry between God and man (despite allusions to a future reconciliation in Aeschylus' *Promethean Bound*), e.g., *Promethean Bound*, *Faust*, and *Frankenstein*; it would not be inappropriate to include here the account of the Fall of *Genesis*. Christianity, however, rid the myth of the rivalry. According to its teachings, God not only made man in His own image and likeness but, through Christ's death and resurrection, enabled him to become His adopted son. The universe and heaven itself henceforth were his inheritance. For example, St. Albert the Great was a Promethean figure who saw man's quest for knowledge as an unfolding of God's plan. For him the honor and glory of God were the primary inspiration for the pursuit of knowledge. Enthusiastically, relentlessly, Albert pursued knowledge in theology, philosophy, the natural sciences, mathematics, and even in astrology and magic.<sup>11</sup> And although the intellectual appetite of his brilliant pupil, St. Thomas Aquinas, was not so broad and exotic, he too doggedly and optimistically pursued the truth wherever it might lead. Thus the sense of man's preeminent dignity implied in Prometheus' defiance of Zeus has been affirmed and super elevated by divine grace; the latter has similarly validated the desire for knowledge, power, and autonomy.

But in secular humanism - which can only be understood as a post-Christian humanism - a newer Prometheanism has arisen that is as defiant of God as it is dismissive of Him; more than an atheism, secular humanism has justly been called an "antitheism."<sup>12</sup> This new brand of Prometheanism has an optimism to match its enormous defiance of God. Consider, for example, Shelley's *Promethean Unbound* and Marxist doctrine. Thus two kinds of Prometheanism can be detected at work in the contemporary world. The one may be called "Christian Prometheanism" in that it manifests itself in man's insatiable desire for knowledge of and mastery over nature, but it sees the fulfilling of this desire as an unfolding of the Divine plan and its actual and final fulfillment in God alone. The preeminence of man in nature which this kind of Prometheanism presupposes derives its special *élan* from the conception of him as made in the image and likeness of God and as super elevated through divine grace to being an adopted son of God for whom the universe is now his patrimony. The second kind of Prometheanism can be called "Post-Christian Prometheanism," for although rejecting Christianity and, for that matter the existence of a supreme being, its prodigious energy and optimism presuppose the aforesaid Christian contributions.

Now the first point I wish to unfold in this lecture is that the biological revolution gravely threatens the future of mankind because it derives much of its impetus from Post-Christian Prometheanism. This form of Prometheanism returns man to the tradition wherein Prometheus destroys himself. The rejection of God only further conduces to the absolutizing of scientific knowledge and hardening of the dogma of infinite progress, both of which produce a deformed conception of human dignity and destiny. The inevitable result of this deformity will be the manufacture of Frankenstein monsters rather than the anticipated improvement of the human species.

The second point I wish to unfold is that the biological revolution itself is not the threat. Were Christian Prometheanism the driving force behind it, the Promethean *élan* would be channeled so as to

produce an improvement in the human species as genuine as it would be spectacular. The banks of this channel would be formed, on the one side, by the realization that divine knowledge is the paradigm for knowledge, and, on the other side, by an authentic conception of man's dignity and destiny.

The destructive potential of the biological revolution warns us that man's ontological reach exceeds his ontological grasp. But the *élan* of post-Christian Prometheanism induces in man a forgetfulness of his creaturehood and intrinsic limitation. Secular humanism's failure to see that creaturehood is not a condition that can be overcome blinds its apostles to the insuperable obstacles in their path. The attendant failure to see that human power and knowledge - the two areas of Promethean endeavor - are accordingly limited and to see in what ways they are limited explains at the outset the inevitably destructive end of any Prometheanism that would rival God. Specifically, post-Christian Prometheanism unwittingly treats *power* and *knowledge* as univocal rather than analogous concepts.

### **Creature and Creator**

The idea of endless progress is a modern contribution to the Promethean myth and it vividly portrays the erroneous view of creaturehood entertained by post-Christian Prometheanism. The idea of endless progress presupposes a lineal rather than a cyclical view of history, a view characteristic of the Enlightenment. I think that it is arguable that the view has its seeds in the Judeo-Christian teachings, specifically in the doctrine that God created the world *ex nihilo* and in the doctrine of Christ's transformation of the world through His death and resurrection: "Behold, I have made all things new."<sup>13</sup> The pagan doctrine of the eternity of the world left no room for novelty insofar as its view of history was inevitably cyclical. For in an eternal universe - since by definition it has no beginning - nothing new can occur; every event occurs an infinite number of times. But if you accept the doctrine that the world was created in time, then - since the world was new, i.e., has a beginning - you cannot deny the possibility of novelty and uniqueness in it, for its history must then be lineal. This is not to say that its lineal progress must be uninterrupted. It can have cyclical, even regressive episodes of considerable duration and still be progressive in its overall configuration. Nevertheless, although the writers of the Enlightenment inherited the idea of progress from the Judeo-Christian tradition, the idea received a new twist at the hands of secular humanism. The Judeo-Christian tradition can easily be harmonized with the idea of endless progress, if by the latter is meant that human culture will continue to advance as long as mankind exists and that, no matter how long that may be, its approach to perfection will always be asymptotic; that is to say, it will never have exhausted all possibilities for improvement. For as remarked earlier, the Judeo-Christian view is that man cannot satisfy his desire for the infinite until he is with God in eternity. But modern secular humanism maintains, on the contrary, that the promises of progress can be realized, fully and perfectly, in this temporal existence. You have only to consider the writings of Karl Marx for an example of this view.

Some thinkers go farther than this, maintaining that man will continue to progress until he himself becomes God. This view was unabashedly advanced in the nineteenth century, as can be seen in Shelley's epic poem, *Prometheus Unbound*<sup>14</sup> and in Feuerbach's *The Essence of*

*Christianity*.<sup>15</sup> While it is far from clear what it means to say that mankind will become God, those who entertain this view regard God as a projection of human aspiration, an ideal of perfection which motivates human beings in their struggles on this earth. Feuerbach is the best known and no doubt the most influential proponent of the man-God thesis. As it goes well beyond Christ's exhortation, "Be ye perfect as your heavenly Father is perfect", it is reasonable to ask for the rationale behind the man-god aspiration. In Feuerbach we find a rather crude materialism as the underlying reason and, indeed, it is hard to see what else could lead to so grandiose a conclusion as that man will become God. With an almost cavalier argumentation, he asserts the identity of reality with matter.<sup>16</sup> His materialism accordingly leads him to construe the difference between the finite and the infinite as a difference in quantity: man, the individual, is infinite; his powers are limited, making him dependent on other human beings. Mankind, on the other hand, is in-finite because the totality of individual men overcomes all limitation insofar as the limitation of the powers of any individual member is completed by the powers of all the other members.<sup>17</sup>

The crudity of Feuerbach's philosophizing evinces itself in this wholly unsatisfactory view of what constitutes the difference between the finite and the infinite. By definition the individual is finite because to be an individual is to be set apart from others and hence to be limited. But to suppose, as Feuerbach clearly does, that the infinite is the sum total of individual parts is to fail spectacularly in understanding the meaning of "finite" and "infinite." All the men and women who ever lived could not constitute an infinity, even in numbers. For infinite is by definition what is in principle or nature unlimited. But no matter how many human beings you may imagine or wish to posit, you will never have an infinity, for you can then still imagine one more human being. No matter how stupendous the total intelligence of mankind, you can always imagine an increase in that intelligence; the same can be said of talent, power, etc.

The difference between the finite and the infinite has nothing to do with quantity as *such*, the latter being the measure of matter. The difference between them is the difference between the contingent and the necessary, between participated being and being itself. Permit me to illustrate the point by borrowing an analogy from Thomas Aquinas: if whiteness were a subsisting reality, there could only be one whiteness in existence since it would be infinite; you cannot, after all, increase the whiteness of whiteness itself. But even though there could only be one existent whiteness, there could nevertheless be many white things, for rather than being whiteness itself; i.e., white by essence, the latter only participate in whiteness. Equally, because God is existence itself, His being is infinite. Other beings, which is to say, creatures, can exist, but only because they are not, could not be, existence itself; rather they only participate in existence. Thus, no matter how vast the magnitude of its achievements, mankind can never over-come its finitude, conquer its essential limitedness, for finitude, as we have just seen, has, in principle, nothing to do with quantity and, *a fortiori*, cannot be transformed into infinitude by an increase in quantity. The totality of human beings is just as finite as one individual human being.

The failure to grasp the difference between the finite and the infinite, whether this failure be

enshrined in explicit philosophical assertions or remain implicit in an ideology of unending progress and the perfectibility of man, is, I suspect, a powerful contributing factor in the conviction that man can become like God in knowledge and power. And because the conviction springs from a fundamental philosophical error, it can remain nothing more than an illusion. But, as Dostoyevsky's character Kirillov dramatically illustrates by his philosophically motivated suicide,<sup>18</sup> when man thinks that he himself is God, he destroys himself.

### **Creative Power as an Analogous Concept**

The Faustian and Frankenstein examples of the Promethean figure, stretching to its limits the desire to be like God, not only conclude that the products of human creation are inferior to those of nature but also that, even though man might gain the power to control it; indeed, his very creation will turn to his own destruction. The metaphysical source of this limitation seems to have been adumbrated by Mary Shelley in the introduction to the 1831 edition of *Frankenstein*:

... invention it might be humbly admitted does not consist in creating out of a void, but out of chaos; the materials must, in the first place, be afforded: it can give form to dark, shapeless substances, but cannot bring into being the substance itself.<sup>19</sup>

Being a creature, man is *a creator* only analogously. While it is correct to describe Verdi as a creative composer of opera - hence his claim to the title "the Father of modern opera" - the fact remains that there could have been no Verdi (as "the Father of modern opera") if there had not first been a Bellini to influence him. And despite Newton's powerful creative genius, he would not have arrived at his theory of gravitation had he been isolated from the work of his predecessors and contemporaries.<sup>20</sup> Thus man, the creator, creates only analogously rather than absolutely because he does not, cannot, create *ex nihilo*; he requires preexisting materials. His "creations" can be likened to the production of a mosaic, wherein the artist arranges preexisting materials in novel ways. But even the extent of the novelty is limited by the inherent determinations and limitations of the materials. (Moreover, the novelty itself is not novel in the absolute sense, for it has for eternity been a possibility in the mind of God.) Thus man from the very start of his enterprise lacks complete control over the products of these enterprises. Faust, for example, was forced to acknowledge the limitations of his creaturliness when, having been terrified by the momentary apparition of the spirit he had conjured, he says: "If I have the power to draw you, I have no strength to hold you."<sup>21</sup>

The desire to be like God can have no bounds other than those of desire itself. We have noted that in the theistic universe, man's desire to attain absolute knowledge and power has its fulfillment not in this temporal life but in the Beatific Vision of the afterlife. Since the denial of God's existence does not extinguish the desire to be godlike, the atheist seeks fulfillment of this desire in temporal life. Thus the prospect of genetic engineering and cloning, both conferring on man the power to make humans as we deem desirable and the preeminent

achievement, creating human life itself, thereby making him master of life and death, are crucial steps toward the fulfillment of these ultimate desires. The desire to be like God and the primordial determinations of the preexistent universe thus confront each other in what may fairly be described as mortal combat.

### **Knowledge as an Analogous Notion**

Descartes has justly been accused of “angelizing” man by defining him simply as a thinking being.<sup>22</sup> But he is also guilty of deifying man by implicitly taking human knowledge as the standard of all knowing. For insofar as he refused to accept as philosophically true any proposition that cannot be apprehended as clear and distinct or demonstrated as necessarily true, he rendered intellectually suspect the highest function of intellect, namely, that whereby the human intellect apprehends truly but hazily not only the most intelligible and loftiest truths but also the concrete singular existents in their singularity. The impact of this approach to knowing on subsequent Western culture has been enormous. It has glorified human intellect and knowing, with all their limitations, as the standards. Accordingly knowing seen as an analogous notion, with Divine knowing as the primary analogate, became less and less appreciated. The current widespread view that that alone constitutes authentic knowledge which can be expressed in concepts, and in concepts of a quantitative and measurable knowledge at that, should hardly surprise us.

How this implicitly assumed notion of knowledge pertains to the biological revolution discloses itself in the eugenic ambitions of those who support the laboratory manipulation of human life. There can be little doubt that procedures such as in vitro fertilization, artificial insemination, embryo transplants, surrogate mothers, genetic engineering, and cloning excite the greatest enthusiasm among members of the scientific community and intelligentsia when seen in terms of their eugenic possibilities: the artificial production of human beings according to certain types which are regarded as desirable for the species. But this eugenic goal would reduce man to the level of brute animals, for it implies that he is primarily a *what* rather than a *who*. We value an animal primarily according to the type to which it conforms - disposition, sturdiness, fecundity, etc. In contrast, we value a human being primarily for his selfhood, for his uniqueness as a center of conscious, autonomous being. If human rights mean anything, they mean that he possesses that kind of value. For what do rights presuppose if not that individual men and women are naturally and justly entitled to live and act free from interference in certain areas of their lives? And what, in the end, can be the rationale for this entitlement but that each human being is a person or a self?

The generation of life involves the uniting of the contributed male and female chromosomes into a unique genetic combination. The possible number of these combinations is practically inexhaustible. We cannot therefore predict with any kind of accuracy what our offspring will be like. Their intelligence, temperament, talents, health, etc., all remain a mystery until they are born, and more precisely, until they reach maturity. This consideration is especially important with regard to the generation of human offspring. Because the source of man's dignity as well as his primary importance to society is his personhood, his ontological

uniqueness as a self, the attempt to valorize him according to a type necessarily reduces, to a considerable extent, the possible number of genetic combinations and thus, by reducing the biological conditions, reduces the range of persons that can be conceived. And this, in turn, must progressively diminish the possibility of the unique contributions of a Socrates, St. Theresa of Avila, Beethoven, Einstein, Churchill, Mother Teresa, etc.<sup>23</sup>

When it comes to the concrete particular entity, what we call the "individual," science is no better off - in fact, it is worse off - than philosophy; it cannot know the individual *as such* because the individual *as such* cannot be grasped conceptually; and since its control over nature depends upon its knowledge of things, it follows that its control over the individual must be as indirect and tentative as is its knowledge of it. Science operates from generalization and that is why its prodigious predictive power is limited to statistical frequencies and correlations. Scientific prediction is thus no more than highly sophisticated guessing; it calculates the probability of a given event occurring a given number of times according to a standard, say, one hundred *per cent*. As long as predictive success remains high, the failure of some of the entities in question to conform to the predication does not invalidate the hypothesis. But the significance of the failure rate depends upon the kind of entity under investigation, especially on whether it is human or subhuman. If human, then the failure of even only one out of every thousand or million or billion, or however vast a number you wish, is not necessarily to be written off as an insignificant anomaly. Because subhuman beings are not selves, the abstractive process by which scientific generalization reduces individuals having similar relevant properties to the same common denominator does not do violence to their nature. But human beings are selves; each is a center of the universe, his actions follow from a unique ontological interiority, and he is self-perfecting and self-determining. Consequently, the attempt to reduce his uniqueness, which is essentially and primarily ontological rather than psychological, to the common denominator of a type can radically violate the nature of the individual human being. If the generalization seeks simply to predict the frequency with which a certain biological type occurs, then obviously no violation takes place. But if the generalization ruled out of court as in-significant the individual *as such* (a dismissal encouraged perhaps because the individual *as such* cannot be absorbed intact into the generalization), then he could well suffer the violence of the Procrustean bed.

Intelligence, health, physical type, etc., in short all the things that supporters of eugenics have in mind when they call our attention to the types of men and women that they regard as desirable, are, in philosophical terms, "accidents;" the substance they do not know. Expressed in terms of the Aristotelian doctrine of substance and accident, they would know the accidents of their laboratory subjects directly, e.g., their intelligence or morphology, and their substances only indirectly, i.e., the concrete singular entity, "Adam." But the substance is the subject of the accidents: intelligence, let alone degree of intelligence, physical type, temperament, etc., do not exist by themselves but as modifications of the substance. It is after all this particular human being, "Adam," who has the intelligence. We say that the intellect knows when, accurately speaking, it is the individual man who knows.<sup>24</sup>

Now here is the rub. Because, as accidents, intelligence, health, talent, etc., have no reality in themselves but derive it only insofar as they share in the existence of the substance - they are, in other words, ways of being - what is of primary importance is the substance, the concrete, singular entity. But since the substance cannot be known in its singularity, we must face the fact that we cannot know things, not, at any rate, with a direct conceptual knowledge, in their most important aspect. We can, to be sure, know the substance of Adam as “this particular human being.” But this occurs through a combination of direct knowledge of his essence, *man* (a conceptual knowledge produced by the intellect's abstraction of the thing's intelligible form), which knowledge is then, by a reflexive action, returned to the concrete being of a specific type. Through intuition, a non-conceptual knowledge, we know that concrete singular as such and, *a fortiori*, know the concrete, singular human being, “Adam,” in his singularity or uniqueness - which is to say in his selfhood, in the unique, unrepeatable person that he is.<sup>25</sup> But, although it is the highest, most important kind of knowledge, intuition (*intellectus*), by the very nature of its operation and object, does not lend itself to conceptual formulation and thus eludes the embrace of scientific methodology.

With regard to the scientific knowledge of subhuman beings, our inability to know the individual *as such*, although admittedly a limitation, poses no important threat to their dignity or to mankind for the simple reason that animals are not persons, not unique centers of conscious, autonomous being. That is why we regard the breeding of animals for the production of offspring that embody the ideal type as part of the natural order of things. Conversely, the value of a human being is precisely in his uniqueness as a subject. To breed men and women for an ideal type, whether that be intelligence, talent, morphology, etc., is to invert the natural order by endeavoring to make the substance serve the accidents. A stupid or sickly man is every bit as dignified and valuable as an intelligent or healthy one; each man and woman possesses a preeminent dignity by virtue of an ontological interiority: each is a person.

Here then is a second area where the Promethean aspiration overstretchs itself, where Icarus flies too close to the sun only to plummet into the sea to his destruction - the inability of the human mind to know the individual *as such* and thus the inability of science to grasp the human being in his unique selfhood. In his masterful novel, *Dracula*, Bram Stoker reveals insight into this point when he has one of the characters observe:

It looks like religious mania, and he will soon think that he himself is God. These infinitesimal distinctions between man and man are too paltry for an omnipotent being. How these madmen give themselves away! The real God taketh heed lest a sparrow fall; but the God created by human vanity sees no difference between an eagle and a sparrow. Oh, if men only knew!<sup>26</sup>

Add this limitation to that discussed above, namely, that man creates only in an analogous sense, and you can see the metaphysical basis for the destructive end to the Promethean creations in *Faust* and *Frankenstein*. The lesson of these Promethean myths does not depend

on the swift and cataclysmic occurrence of man's destruction. His destruction could as easily occur slowly and imperceptibly by a process of evisceration. Assume for the sake of argument that the laboratory reproduction of human beings in our own image and likeness - i.e., according to an ideal type - comes about. During and after its occurrence, the members of the human race might plausibly remain oblivious to the disaster. For, if breeding for an ideal type inevitably narrows the range of possible combinations of genes, thereby progressively delimiting the possible number of unique human beings coming into existence, there would most probably be no awareness of these lost possibilities. Those who did come into existence would, to be sure, be unique. But the totality of the contributions of these beings would be limited because it would be constricted by the possibilities contained in the ideal type. The reciprocal and overall influence of the widest number of unique beings is what the human species needs for its vitality and progress. Uniqueness of self, recall, is at the very heart of the dignity and value of the human person. And this uniqueness is, before he or she exists, unpredictable and, after that existence ends, irreplaceable. Thus the laboratory reproduction of human beings must produce an increasingly stereotypical man and woman. Although gradual, such a deterioration of creative, vital resources could, in the end, prove as destructive of the human race as a nuclear holocaust.

### **The Pivotal Ontological Consideration**

Whether Pre-Christian, Christian, or Post-Christian, the Promethean myth proclaims the preeminent dignity of man in nature: man the knower, the seeker of knowledge, the very quest itself revealing his perception of himself as the inheritor of the universe. It is not simply man's right to know what the Promethean myth proclaims but, more fundamentally, his right to determine his own life and destiny. Only, the desire to know and the desire for self-determination are inextricably bound together. But between the Christian and Post-Christian forms of Prometheanism stands a pivotal consideration which determines the meaning of man's dignity as a rational, autonomous, creative agent. When you admit the existence of God, you acknowledge the universe as *a creation*, as something *given*,<sup>27</sup> because there is a "draughtsman," i.e., essences, intelligible structures, in things. (Although in the order of discovery, the human mind proceeds in the opposite way: seeing that things are intelligible, that they embody essences, it is led to the conclusion that there must exist a "draughtsman.") In the second part of his *Summa Theologiae*, Thomas Aquinas represents essence such that it is at once the sign of man's creaturehood and his imaging of God. It seems to me that this representation is quite pertinent to the task of reconciling human dignity and human limitation:

... law, being a rule and measure, can be in a person in two ways: in one way, as in him that rules and measures; in another way, as in that which is ruled and measured, since a thing is ruled and measured, in so far as it partakes of the rule or measure. Wherefore, since all things subject to Divine providence are ruled and measured by the eternal law ... it is evident that all things partake somewhat of the eternal law, in so far as, namely, from its being

imprinted on them, they derive their respective inclinations to their proper acts and ends. *Now among all others, the rational creature is subject to Divine providence in the most excellent way, in so far as it partakes of a share of providence, by being provident both for itself and for others. Whereof it has a share of the Eternal Reason, whereby it has a natural inclination to its proper act and end; and this participation of the eternal law in the rational creature is called the natural law.*<sup>28</sup> (Emphasis added)

If the natural law is the eternal law of God as the latter expresses itself in the being of creatures possessed of reason and free will, it follows that, just because man is a creature, he does not have perfect autonomy; he is not absolutely self-determining. Although he directs his life by reason, he nevertheless remains subject to the inclinations of his essence. It is his essence (“blueprint”) - what he has in common with all men (*unum in multis*)- rather than his unique selfhood which impels him to his final end of happiness in God. Even his intellect and will, the source of his preeminence in nature impressed upon him by the Creator determine his way of reasoning and choosing.<sup>29</sup>

If we accept the view that man is self-determining, but not absolutely so - and it seems to me that our experience confirms this view - then we have a rule and measure for reconciling man's preeminent dignity with this limitation which has its ground in what he essentially and really is. From a knowledge of man's essence - which is learned *experimentally (operatio sequitur esse*<sup>30</sup>) - we learn two things: first, man has an essence and therefore is not undefined at the start of his life but is in fact specified so as to exist according to a predetermined intelligible structure. He does not create his own nature, but creatively actualizes the potentials as a man, and more precisely, as a unique embodiment of man. As a being of a specified type, he reveals himself as a being that is “ruled and measured.” second, we learn from the specificities of his essence that he has determinate finalities and exigencies, that he has a natural inclination to his “proper act and end.”

Thus, although we cannot know a priori how we ought to behave in specific cases, say, of gene manipulation, what we have learned experimentally about man's essence indicates basic kinds of conduct that are immoral because contrary to the finalities of that essence. For example, treating men and women as mere means to an end, as mere objects of scientific research or social purpose: destroying human beings, whether in the blastula, embryo, or fetal stage, because they are growing deformed; producing men and women with varying degrees of intelligence (semi-morons for menial work, e.g.) or with physiological anomalies to increase dexterity in the performance of certain specialized tasks, such as with abnormally short legs attached to a normal sized torso with stooped shoulders for working in mines or other troglodytic ventures.

In itself the conclusion that we are to base our decisions concerning the genetic manipulation of mankind on the exigencies and finalities of our essence is anticlimactic. As a statement of the ontological basis of ethics it is unexceptionable. But we have seen that the

Promethean challenge runs deeper than the search for moral norms. It arises out of the frustration of the creature who would share the in-finite knowledge and power of God. Now, in addition to supplying the basis for moral conduct, the pivotal ontological consideration plumbs the depths of the Promethean challenge and points the way to the reconciliation of man's creature hood with his desire to be like God.

To be at once “that which is ruled and measured” and a being “who rules and measures” generates frustration only when knowledge is subordinated to power. The subordination may well reflect the ancient confusion of knowledge with magic, but in the modern age knowledge and power surge together spontaneously from the application of the univocal conception of knowing to science. For its advances in knowledge, science relies upon hypothesis and prediction, a methodology that has proved itself to be prodigiously successful. So tightly does this methodology bind together knowing and the exercise of power over nature that one can easily be led to affirm Bacon's dictum, “Knowledge is power.” And when knowledge is conceived univocally and human knowing is thus enshrined as the paradigm of knowing, then the subordination of knowledge to power is complete. For, as argued above, if the criterion of knowledge is that which is clear and distinct (to the intellect of man), then it is inevitable that a method which vindicates knowledge by increasing his control over nature will become the standard of knowledge. Thus the method of hypothesis and prediction can easily be reinterpreted to mean “knowledge is manipulation.” John Dewey, for example, who could not have been more emphatic in his approval of the dictum, “Knowledge is power”, argued that we can properly say that we know a thing only to the extent that we can bend it to our will 31

Moreover, the intimate connection in scientific methodology between knowing and the exercise of power cannot help but arouse charges of obscurantism against those who argue that the laboratory reproduction of human beings ought not to be pursued. After all, does not the curtailment of scientific research in any given area impose constraints on the pursuit of knowledge and thereby obstruct human progress?

To see the proper connection between knowledge and power, a brief analysis of knowledge is in order. The analysis requires, however, a change in terminology. Because power is a species of action, the more accurate juxtaposition is that between knowledge and action rather than between knowledge and power. Because what is true of the genus must be true of the species, what is true of action must accordingly be true of power. What will emerge from the analysis of knowledge is that no opposition exists between knowledge and action because knowing is the most perfect form of action.

To illustrate this point, let us ask ourselves what a perfect act is. Any act in which an agent acts upon a being outside himself is imperfect in this sense: that the former's activity is not for himself but for the other. For example, the surgeon operates on the patient to improve the latter's health rather than to benefit himself. Of course, the surgeon benefits, but only indirectly: the practice of surgery improves his skills and most likely he gets paid for his services. Whatever the surgeon's personal motives for operating on the patient, the fact

remains that the art of surgery derives its rationale from the goal of healing; it exists for the benefit of the sick. Thus the surgeon, *as surgeon*, is dependent on the sick, for if no one were sick, there would be no need for surgery 32 In contrast, an act which by its very nature directly benefits the agent is a perfect act and is called *immanent* because its activity is, in the end, ontological, for it is the activity of a being that exists for its own sake rather than for another 33

Knowing is the prime example of immanent activity. That knowing is primarily understanding (*intellects*) as opposed to discursive (*ratio*) reveals itself in a consideration of the goal of all thinking that may be called “problem solving” - understanding. This kind of thinking is discursive because in doing it we move from what we know to a knowledge of what was previously unknown. Thus it is correct to say that discursive thinking is imperfect knowledge because perplexity, ignorance and doubt are its muses. Were we free from these states of mind, we should have no need for this kind of thinking. Because its rationale is understanding, discursive thinking is a transitive activity and is therefore imperfect activity. This is not, however, to suggest that discursive thinking occurs independently of understanding at any given moment. For it is quite clear that, as we reason our way from A to B, we simultaneously *understand* the terms of the reasoning. Nevertheless, the discursive process betrays our imperfection as intellectual substances, for it signals that we are only “on the way” to understanding. Once we solve the problem, we have arrived at the state of intellection, i.e., understanding; there we have the *raison d’être* for discursive thinking and there our intellectual labors come to rest. If discursive thinking is for the sake of understanding, understanding is for the sake of nothing else; as an immanent act, it is a perfect act. To say that understanding is for its own sake is to speak of understanding *as such*. Understanding arrived at as successive stages in problem solving facilitates the solution of further problems and is assigned an instrumental value. But in science, philosophy, literature, and art - which is to say in higher reaches of human thought - the goal is understanding and nothing more.

The pursuit of understanding for its own sake permits man to transcend the tension between his preeminence and creature hood by establishing the priority between knowledge and power. In this accomplishment is vindicated the finest impulse expressed in the Promethean Myth, for it reconciles man’s desire to share the infinite power and knowledge of God - to be a being “who rules and measures” - with assertion that there are some things which he not only cannot achieve but which he ought not to attempt - a reminder that he is also “that which is ruled and measured.”

It is knowledge for the sake of understanding which confers on man genuine mastery over things. This can be certified by a consideration of our dealings with the material world. As we had occasion to observe earlier, a fundamental indication that we are creators only in an analogous sense is that our creativity is limited by the predeterminations of preexistent matter. Despite our prodigious technological achievements, our mastery over matter re-mains tenuous; we never master the material world completely: we fell trees and crush rock to build our structures; but wood rots and concrete crumbles. We transform fossils into fuel, but the

pollution of our atmosphere is a serious side-effect. In its inner structure matter is irreducible and accordingly successfully resists our attempts at total domination.<sup>34</sup>

In knowing, on the contrary, we master things completely. Knowing is a becoming of the thing by the knower.<sup>35</sup> Knowing consists in the knowing subject apprehending the essential structure of the thing known. Because knowing is a becoming, the knowing subject thus masters the thing in its innermost being. Intellect therefore more perfectly masters its object than does will, for the latter is confined to a purely external relation to things.<sup>36</sup> Again, because knowing is a becoming of the other *as other*, it reveals itself as the primary way in which it is true to say that man is in God's image and likeness. Becoming the other *as other*, man overcomes the limitations of his finite being insofar as he can thereby become all other things, and all the while retain his unique selfhood: it is always *I*, the unique self-aware subject that I am, who knows. Thus the individual man, who is a unique center of the universe, can, through knowing, unify the fragmentation and plurality of the universe within himself: as a knower, man is *virtually* infinite.<sup>37</sup>

We are now in a position to address the charge, alluded to above, that the proscription of specific areas of scientific research obstructs human progress. Consider the difference between “problem” and a “mystery.” A problem lends itself to a solution; all that is required is that the pieces of the puzzle be fitted together, a feat that very often depends on the discovery of new data. A mystery, on the other hand, has no solution; the discovery of new data is irrelevant. Instead, we penetrate ever more deeply into the reality of it. Thus the progress of knowing, *as understanding*, is genuine progress. The advances made in problem-solving, the *modus operandi* of the sciences, are more correctly termed *advance by overthrow and replacement* than *progress*, for there is often no continuity in the change from one scientific view to its replacement.<sup>38</sup> The discovery of fresh data often results in the falsification and abandonment of long standing theories. But knowing, as understanding, is genuine progress because as our understanding of reality deepens, we witness the marriage of continuity and change. Continuity because it is one and the same reality our intellect continues to penetrate, the nature of man, say, or beauty, without the addition of new data; changes because our knowledge of reality thereby deepens.

The immanent nature of knowing reveals another facet of the preeminent dignity of man. Because knowing is an immanent act, it is, we have seen, a self-perfecting act: the act is its own justification; it is identical with its goal. Now a being capable of a self-perfecting act is a being that is itself self-perfecting and is accordingly a being that exists for itself. Conversely, where knowing is subordinated to power, knowledge can claim only an instrumental value, for its value is contingent upon its capacity to contribute to the manipulation of its object. Thus to seek the rationale for knowing entirely or even primarily in problem-solving is to assign a purely or primarily instrumental value to knowing. But this can only result in the eclipse of the self-perfecting nature of knowing. Where transitive rather than immanent activity is adorned with pride of place, it is inevitable that man descend from the status of a self-perfecting being who exists in some important sense for his own sake, as an end in himself - the human species, for example - a mere means to an end. The valorization of knowing purely or primarily in terms of problem-solving reduces itself, we have seen, to the principle, “Knowledge is power.” The affirmation of this principle cannot help but unleash a demiurgical force before which everything - politics, morals, art,

science and philosophy, even man himself - must submit to the imperatives of power.<sup>39</sup> In the specific area of scientific endeavor that falls into the category of the biological revolution, this reduction of knowledge to power will play out no differently: the project of improving the human species by laboratory reproduction and various forms of genetic engineering will suffer not only from the previously discussed liabilities inherent in creaturely power and knowledge but also from the instrumentalist error of valorizing man entirely or primarily in terms of his usefulness. Besides debasing man who is a being “who is a rule and measure” as well as a being “which is ruled and measured,” it rivets the Promethean impulses to the horizontal plane, thereby preventing any transcendence of the tension between creaturehood and the desire for the Absolute.

We come now full circle to our earlier discussion of the deification of man through the misconception of knowledge as a univocal notion. The validity of the scientific methodology of hypothesis and predication depends on the analogous notion of knowledge with God as the primary analogate, on the divine knowing as the paradigm of knowing. As a perfectly immanent act, knowing is the most perfect form of action. The first conclusion to be drawn from this is that ultimately no opposition exists between knowing and action; indeed, knowing is the most intense and powerful form of action.<sup>40</sup> The second is that since God is the absolutely perfect being, His action must be absolutely free of dependence on others and absolutely for Himself alone; and since knowing, as understanding, knowing for its own sake, is the most perfect form of action because it is a perfectly immanent act, it follows that knowing is the Divine action; and since He is absolutely self-sufficient and independent, the object of His knowledge must be Himself alone. Thus not only must God know all things, possible and actual, by knowing Himself, the first of all actions, i.e., the fiat by which the universe came into being, must have been the Divine self-knowledge. In knowing himself, therefore, God possesses the unity and fullness of being. In contrast, man, the creature, is a diminished intellectual substance who must accordingly rely upon things outside himself for his knowledge. In knowing them, he overcomes his own limitations as well as reunifying the fragmented, diverse beings that comprise the created universe within himself. Thus whereas God and His knowledge are absolutely unified from start to finish, so to speak, man must work his way from plurality to unity, and he does this preeminently through knowing.

Discursive knowing, or problem solving, characterizes the human situation: owing to man's limitation as an en fleshed knower caught up in time and materiality, it is a necessary means to the goal of understanding; in the material world, transitive action is the means to immanent action, work the means to leisure, problem-solving and struggle the means to contemplation. Within this framework, man enjoys his foretaste of identification with the Absolute and Infinite in this life. As Aristotle observed, it is in contemplation that we are most like the divine.<sup>41</sup> Here then knowledge and power, creaturehood and the yearning to be like God, is reconciled in the perfect action that is knowing.

## Conclusion

I said at the outset of this presentation that the biological revolution in itself poses no threat to mankind and that if Christian, rather than post-Christian, Prometheanism were the driving force behind it, the Promethean *élan* would be channeled so as to produce an improvement in the human species as genuine as it would be spectacular. Consider, for example, the prospect of genetic engineering, and specifically

“gene therapy.” Although we are now nowhere near the day when we shall be able to replace or repair dysfunctional genes, it remains nevertheless a goal worthy of our best efforts. From the vantage point of what I have called “the pivotal ontological consideration” we have, through experiential knowledge, an understanding of our human nature - that by which we are “ruled and measured” - which nature is the blueprint according to which we could use gene therapy to eliminate neuro-psychological impediments to the full expression of its potentials. Think of what it would mean to eliminate, once and for all, from the human race the scourge of Downs Syndrome! Thus that by which we are “ruled and measured” supplies us with an answer to Jonathan Glover's question, “What Sort of People Should There Be?” Man's nature, or essence, is the Divine proclamation of what he is and can be. Because we are also beings who “rule and measure,” our challenge is to use our reason, freedom, and creativity to fulfill the potentials of our nature.

I have argued that to be that which is “ruled and measured” is to be a creature and that the latter condition determines not only *what we ought not to do* but also *what we cannot do*. The lesson of the Promethean Myth is that to attempt them is to destroy oneself. But I have further argued that the acknowledgement of these creaturely limitations does not condemn us to the unrelievable frustration of desiring to be like God and yet never being able to fulfill that desire. That is the result of the rebellion against God, which rebellion implies the absurdity of denying man's intrinsic ontological insufficiency and dependency. On the contrary, because we cannot create in the absolute sense and because we ought not to try to create human beings as if we were breeding animals, it does not follow that we must abandon our attempts to emulate the infinitude of God, that we thus voluntarily erect barriers to human progress. For on many levels our laboratory research will carry us forward to ever fuller realizations of man's essence. But, at all events, the integrity of his essence should fill us with the wonder of God's creation and through the contemplation of his works raise us to higher and higher levels of being. Let us say that rather than leading us to derogate man's striving for increasing power over his existence, the acknowledgement of knowing as the most perfect form of action enables us to see that man's greatest power, that in which he most emulates God, is through the contemplative activity of knowing for the sake of understanding. Providing us with a vertical ascent, the latter uplifts the purely horizontal advance of transitive activities, in this case, the problem-solving activity and predictive goals of science, so that our biological researches will always be accompanied by an increasingly transcendent view of man and his relation to nature and God. Christian Prometheanism leads therefore to authentic progress, while post-Christian Prometheanism, in its rivalry of God, generated nothing more than the illusion of progress. Goethe wrote Part II of *Faust* in the reflective wisdom of old age. In the past he describes Wagner's successful generation of human life in a flask. In contrast to Wagner's joy upon seeing the homunculus, Goethe assigns Mephistopheles the task of a rather more sober observation:

He who lives long a host of things will know,  
The world affords him nothing new to see.

Much have I seen, in wandering to and fro,  
Including crystallized humanity.<sup>42</sup>

Perhaps it would be well to mount these words in all laboratories and studies where the biological revolution is seen to hold the hope of the future.

## Endnotes

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- <sup>1</sup> Jonathan Glover, *What Sort of People Should There Be?* (Harmondsworth, Middlesex, England: Penguin Books Ltd., 1984)
  - <sup>2</sup> Jeremy Rifkin, *Algeny* (Harmondsworth, Middlesex, England: Penguin Books Ltd., 1984), Part One.
  - <sup>3</sup> Glover, pp. 130 ff.
  - <sup>4</sup> James Schall, S.J., *The Politics of Heaven and Hell* (Lanham, Maryland: The University Press of America, 1984), p. 141; see also Ch VIII.
  - <sup>5</sup> Schall, Ch VI
  - <sup>6</sup> David Ketterer, *Frankenstein's Creation: the book, the monster, and human reality* (Victoria, B.C.: University of Victoria, 1979), 19-20
  - <sup>7</sup> Johann Wolfgang Goethe, *Faust*. tr. by Carlyle I. MacIntyre (Norfolk: New Directions, 1941), (2 vols.) Vol. I, part I, p. 35.
  - <sup>8</sup> Bettina Knapp, *The Prometheus Syndrome* (Troy, New York: The Whitston Publishing Co., 1970), pp. 91-2.
  - <sup>9</sup> Goethe, *Faust*, tr. by Philip Wayne (Baltimore: Penguin Books, 1959) (2 vols.), Vol. 2, Part II, pp. 91-2.
  - <sup>10</sup> Mary Wollstonecraft Shelley, *Frankenstein or the Modern Prometheus* (New York: The Heritage Press).
  - <sup>11</sup> Knapp, ch. on Albertus Magnus.
  - <sup>12</sup> Henri de Lubac, S.J., *The Drama of Atheist Humanism*, tr. by Edith M. Riley (London: Sheed & Ward, 1949), p.97
  - <sup>13</sup> See, e.g., Pope John Paul II *Redemptor Hominis*, #14

- 14 Carl Grabo, *Prometheus Unbound: An Interpretation*. (Chapel Hill: The University of North Carolina Press, 1935). pp.14-15 and esp. 185; Percy Bysshe Shelley, *Prometheus Unbound*, III, iv (8-130); IV, (554-78)
- 15 Ludwig Feuerbach, *The Essence of Christianity*, tr. by George Elliot (New York: Harper & Row, 1957), pp. 2- 3, 38-39; but esp. 40-41 & 153.
- 16 Feuerbach, p. 91
- 17 Feuerbach, pp. 152-3
- 18 Fyodor Dostoyevsky, *The Possessed*, tr. by Constance Garnett (New York: Dell Publishing Co. Inc., 1961), Pt. III, Ch 6, pp. 630-41
- 19 Quoted in Ketterer, pp.11
- 20 Herbert Butterfield, *The Origins of Modern Science* (New York: The MacMillan Company, 1960) Ch VIII, esp. pp. 151 ff.
- 21 Goethe, *Faust*, MacIntyre transl., Vol. I, Part I, p. 35
- 22 Jacques Maritain, *St. Thomas Aquinas*. Newly transl. & revised by Joseph W. Evans and Peter O'Reilly (New York: The World Publishing Co., 1962), pp. 91-92; see also Knapp, p. 156.
- 23 “The primary role of sex is more subtle than straightforward reproduction: it is the creation of genetic diversity among offspring. An organism that reproduces without sex, say by hatching unfertilized eggs, can replicate itself exactly, gene by gene, without wasting time on courtship. But if all the offspring are identical, they are less likely as a group to withstand important changes in the environment. Suppose that a disease sweeping through the area kills all the individuals with the mother's hereditary makeup. If the mother has reproduced in a nonsexual manner, she and all of her offspring would perish. But if she had mated with a male bearing disease-resistant genes, at least some of her offspring would survive. Also surviving would be the tendency to reproduce sexually; sex itself can be said to be favored by natural selection. Sex is slower than nonsex, but it provides a balanced array of genetic combinations to present to the world. It spreads the hereditary investment, including all the time and energy that go into reproduction, in a way that copes more consistently with harsh and constantly changing environments. Most biologists agree that adaptability, the general ability to adapt, is just as important as adaptiveness, the actual set of responses made by organisms to the environment that keeps them alive and allows them to reproduce. This long-term property is what has given sex an edge through eons of evolution and fixed it in the biology of most kinds of organisms.” C. Lumsden and E. Wilson, *Promethean Fire* (Cambridge, Mass: Harvard University Press, 1979), p. 28

- 24 Raymond Dennehy, *Reason and Dignity* (Washington, D.C.: University Press of America, 1981), pp. 43-48.
- 25 Pierre Rousselot, *The Intellectualism of St. Thomas*. Trans by Father James E. O'Mahoney (New York: Sheed & Ward, Inc., 1935), pp. 97-98. See also Jacques Maritain, *Existence and the Existent*. Tr. by Lewis Galantieri and Gerald B. Phelan (Garden City, New York: Doubleday & Company, Inc., 1956), pp. 81-87.
- 26 Bram Stoker, *Dracula* (Garden City, New York: Garden City Books), p.95
- 27 Raymond Dennehy, "The Social Encyclicals: What Has Heaven to Do with Earth?" *Faith and Reason* VIII (Fall, 1982) 232-246, p. 234
- 28 Thomas Aquinas, *Summa Theologiae* I-II, 91, 2 in *Basic Writings of Saint Thomas Aquinas*. Edited by Anton C. Pegis (New York: Random House, 1945), Vol. II pp. 749-750.
- 29 Thomas Aquinas, *Summa Theologiae, I*, 18, a: s 1-3.
- 30 *Summa Theologiae, I*, 89, a.1
- 31 John Dewey, *Reconstruction in Philosophy* (1948; rpt. Boston: Beacon Press, 1957), Ch III, esp. pp. 114- 115.
- 32 Aristotle, *Metaphysics, IX*, Ch 8, 1050a 24-1050b
- 33 Rousselot, pp. 25-26
- 34 *Reason and Dignity*, pp.46-50
- 35 *Reason and Dignity*, p. 48
- 36 *Summa Theologiae I*, 76, a.5, ad.4
- 37 Maritain, *Preface to Metaphysics* (New York: Books For Libraries, 1979), pp. 2-5. For the several positions on the significance of scientific advance see Thomas S. Kuhn, *The Structure of Scientific Revolutions* 2nd ed. (Chicago: University of Chicago Press, 1975), Paul Feyerabend, *Against Method* (London: Humanities Press, 1975), and W.H. Newton-Smith, *The Rationality of Science* (London: Routledge and Kegan Paul, 1981.).
- 38 Dennehy, "Education, Vocationalism, and Democracy," *Thought* LVII (June 1982) 182-195, pp. 191-194.
- 39 Rousselot, p. 24

40 Aquinas, *Contra Gentiles*, Ch 11; Rousselot, pp. 8-9- & 24

41 Aristotle, *Nicomachean Ethics*, X, Ch 8, 1179a 11-31

42 *Faust*, tr. By Philip Wayne, Part II, Vol. II, p. 100.