

GALILEO'S EMPIRICISM -- AND BEYOND

[with an Addendum on Saint Augustine]

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Galileo was very much a **man of the Renaissance**. He was, like that portentous era, a watershed in which the streams of past and present, coming from heterogeneous sources, mixed and mingled. The current that emerged had certain clearly discernible characteristics that made of Galileo a man much more of the future than of the medieval past. Because of this, he is a symbol of the new age of modern science in a fuller sense than Descartes or Bacon. Descartes' impact was mainly **epistemological**, and that of Bacon **methodological**. In Galileo, the epistemological and the methodological are certainly present, but they are submerged in a powerful force of **rhetorical persuasion**, a literary gift put to the service of a passion for convincing the world that he was right about the new **anti-Aristotelian descriptions of motion** and about the **Copernican astronomy**. His interests were divided between these two subjects, motion and astronomy, and he labored to unify mathematics and physics when he treated of these matters in a way that points to Newton and beyond to Einstein.

For example, **it mattered not to him** that there is no such thing as a vacuum in nature -- "Nature abhors a vacuum" Aristotle had said. Galileo insisted, by a logical inference only, that bodies falling in a vacuum would fall at the same rate of speed regardless of their weight and density. Unlike the earlier natural philosophers of the Oxford and Paris "impetus school," Galileo was "really not much concerned with the 'circumstances of Nature.'"¹ This disregard for the empirical real, or for what neoplatonists and Renaissance Platonists alike, even throughout the Middle Ages, termed **appearances**, is most significant, for Galileo was the first of the moderns to assert the reality of the mathematical over the evidences of the senses:

*The consequences of this type of reasoning are very far-reaching for natural science. The **notion of nature** itself is about to be altered by it. The medium is considered as an "interference"; if one is to isolate the effect of weight on fall, it apparently can be done only by conceptually eliminating the medium entirely, even though this forces one to consider a situation that admittedly does not exist in Nature, and which can be reached only on the basis of extrapolation. This runs directly contrary to the entire Aristotelian tradition, within which the "natural" is what normally happens in the normal context. Since there is normally a resistant medium present, one could never arrive at any insight into nature by considering a motion that de facto does not occur in nature.*²

¹ *Galileo, Man Of Science*. Edited by Ernan McMullin. Princeton Junction, New Jersey, **1988**, p. 16. This book was originally published by Basic Books, of New York, in **1967**.

² **Ibid.** McMullin goes on to say, even more tellingly, that in such cases "there could be no direct empirical evidence in favor of one's conclusion here, since it is reached only by logical extrapolation to a nonexistent situation". Galileo's predecessors at Paris had considered what would happen if the resistance to motion were eliminated. But it would never have occurred to them to think of the resultant of such an idealization as natural motion. This is, however, just what Galileo was claiming: to know what is "natural", one has to prescind from the inevitable disturbances that occur in all actual motion. What is "natural" is thus what is isolatable as a "pure" case of a concept, on the basis of careful

And this is just what Galileo did. In his conception of motion, he comes closest to the Platonic tradition in the past and much revived in his own time, while at the same time looking forward; he anticipates the Newtonian-Einsteinian idealizations of nature. What this change signals at the deepest level is the emergence of **a sense of power** over nature that is at the same time utterly foreign to the medieval mentality but which characterizes, in its essence, the mentality of the modern world. This drive to dominate and control and harness the powers of nature was entirely lacking in both the Platonic and Aristotelian mentalities. Plato so abhorred the world of change, of process, of motion, which is exactly what the modern mind seeks to harness and exploit -- Plato so abhorred this realm of change that he considered it the antithesis of science, of real knowledge of the really real, for it is by changing that things fall away from the perfect intelligibility of the ideal separate forms into the realms of fantasy, myth, and illusion. "There was not, nor could there have been a Platonic Science of mechanics."³

With Aristotle, however, the case is quite different. Aristotle was the realist *par excellence*, and his principles of motion **cannot be disproved**. That Galileo and the world of modern science in general, typified by Fr. Stanley Jaki, agree in their contemptuous dismissal of Aristotelian physics, is a root cause of our present chaos.⁴

What emerged in Galileo and with the Renaissance scientists generally was a sense of domination over nature in which **Truth became decidedly subordinate** to this new sense of power in all the realms of knowledge. It is the Edenic promise of Satan: "You will be as gods" wherein power takes precedence over all else, even over the most basic natural instincts such as maternal and paternal love and common decency, as abortion, homosexuality and pornography all bear horrifying witness.

extrapolation from observational evidence". (p. 16) One cannot help but be reminded here, too, of the **evolutionists' extrapolations** to "nonexistence situations" especially in the **fictional past** of millions and even billions of years. One is reminded also of the operationalism of contemporary physicists who also extrapolate from the data given by their instruments which register "the inevitable disturbances that occur in all actual motion."

³ Ibid., p.17.

⁴ As an example of Fr. Jaki's hatred for Aristotle and his willful siding with those moderns who share a similar hostility towards him whom St. Thomas honored with the title of *The Philosopher*, there is this from *God and the Cosmologists*, Regnery Gateway, **1989**, pp. 85-86:

By not making a clear distinction between the Prime Mover and the sphere of stars, Aristotle erected a supreme justification for his view that the mover must be continually in contact with the moved thing. He therefore brushed aside hints that pointed toward the idea of inertial motion or Newton's first law. Furthermore, a pantheistic world view in his case too invited a thinking about the universe as if it were a quasiorganism. He found it therefore most tempting to speak of the motion of its main and small parts as being driven by "volitions". The result was that Aristotelian discourse about the physical world which, to recall a phrase of E. T. Whittaker, is "worthless and misleading from start to end".

Suffice it to say here, in Aristotle's defense, that **St. Thomas incorporated** into his system of Catholic theology, both the principle of motion that holds the mover must be in direct contact with the moved and the Angelic volitions that move the celestial bodies. Fr. Jaki's quarrels with Aristotle turn out to be **also quarrels with St. Thomas**, the Church's official theologian.

³ Ibid., p.17.

For men to become as gods, as Satan promised, **God had to be eliminated** from human reasoning processes, especially from the formulation of the "scientific laws" of nature. Nature, Creation itself, had to be **set free from the Creator** and put in bondage to man.

The empiricism of Galileo and of the Renaissance scientists generally was not yet the "pure" empiricism of modern scientific method whereby all "ideology" is supposed to be rigorously suppressed in order that the un-interpreted data of natural processes may stand forth in pristine objectivity. But it was an empiricism that succeeded in eliminating God's primary agency and its **natural necessity** from all natural processes. It did this by completely changing men's ideas and **ways of looking at motion**.

John Buridan, in the mid-14th century, was already something of a Deist when he abandoned the medieval belief that the Angels are God's agents to move the heavenly bodies and substituted for it the impetus theory that goes back at least as far as the neoplatonic Greek commentator on Aristotle, John Philoponus, in the 6th century.⁵ In *God and the Cosmologists*, Fr. Stanley Jaki makes this defense of Buridan:

... if one looks for reasons that operated in Buridan's mind as he formulated the idea of inertial motion, one stands out by the mere fact that Buridan explicitly refers to it. The reason is that for him the universe is not only created out of nothing but also created in time. It is the createdness of the universe that allowed those who believe in it to consider the

⁵ *Philoponus and the Rejection of Aristotelian Science*. Edited by Richard Sorabji. London: Gerald Duckworth & Co., Ltd., 1987.

John Philoponus, a Christian schooled in Neoplatonism in the sixth century A.D. mounted a massive attack on the Aristotelian science of his day. The attack was tailored to fit his Christian belief, a central contention being that the matter of the universe had a beginning, as the orthodox conception of creation required. ... In 680, a hundred years or so after his death, he was anathematized for his views on the Trinity. This had the ironical result that his ideas were first taken up in the Islamic world, not in Christendom. In the Latin West some became known by direct translation in the thirteenth century, (p. 1)

It seems that Philoponus believed in the Platonic preexistence of the soul, that he was a leader amongst the monophysites who held that Christ had one nature only, not two, human and divine, and that he viewed the Trinity as three substances or godheads. These latter heretics are known as tritheists.

Because of his deep involvement in heresy, it may be seen as Providential that his works did not become known in the Latin West until after the time of St. Albert the Great and St. Thomas Aquinas, or at least contemporaneous with them, for these two great doctors, along with others like St. Bonaventure, were able to see the value of Aristotelian physics and metaphysics and use them in their explanations of the truths of Faith without let or hindrance from such as John Philoponus who is probably the originator of the "impetus school" which so influenced the rise of nominalist-empiricist science in the 14th century universities of Oxford and Paris.

Etienne Gilson also has a section on Johannes Philoponus in his *History of Christian Philosophy in the Middle Ages*. New York: Random House, 1955, pp. 89-91. He says:

The obvious influence of neoplatonism on Christian speculation should not make us forget the no less manifest resistance of Christian thinkers to the doctrines of the eternity of matter or of the transmigration of souls. ... Johannes Philoponus ... is a more important representative of this permanent dialogue between Christianity and Platonism, ... In kinetics, Philoponus gives proof ... of the very versatility of his mind [that] makes it difficult to encompass his thought within anything like a definition.

In his commentary on Aristotle's *Physics* (ca 517), he turns against the doctrine according to which the shock communicated to air by someone throwing a missile, accompanies it and thus keeps it going. Against this explanation of the continuation of motion, which will be maintained by most medieval philosophers on the authority of Aristotle, Philoponus upholds that when we hurl a ball, we impart to it a certain moving force, or "kinetic energy" which continues to propel it after it has left the hand. This theory will be known in the middle ages, as the doctrine of the impetus, or "impulse". We will see it upheld against Aristotle's doctrine in several medieval authors.

*celestial regions of being on equal footing with the rest and therefore governed by the same laws. Unlike Greek and other paganisms that drew the dividing line between the heavenly and terrestrial regions, Christianity drew that line between the supernatural and the natural.*⁶

What Fr. Jaki fails to tell us here is that Christianity up to the time of the empirical movement with William of Ockham in the 14th century believed with the ancient pagans that the celestial and terrestrial realms are essentially different both in their matter and in their motion, the celestial being incorruptible in matter and perpetually regular in natural motion whereas the terrestrial is obviously governed by corruptible matter and changes subject to the unknown factors we term "chance." St. Paul gave a firm basis in Holy Scripture for this medieval doctrine in **1 Corinthians 14:40** where he says: "And there are bodies celestial, and bodies terrestrial; but one is the glory of the celestial, and another of the terrestrial." St. Thomas' teaching on the matter can be studied in his *Summa Contra Gentiles*, Book III, especially chapters 20, 23, and 78 through 82.

The Renaissance reduction of celestial motion and matter to subjection to the same laws as those which govern terrestrial matter and motion reminds one of the modern mechanists who have reduced both living and non-living beings to subjection to the same laws of chemistry. Here is a field open to creationist research.

In *The Savior of Science*⁷ Fr. Jaki quotes what he considers to be John Buridan's "epoch-making cosmological message:"

Also, since the Bible does not state that appropriate intelligences move the celestial bodies, it could be said that it does not appear necessary to posit intelligences of this kind, because it would be answered that God, when He created the world, moved each of the celestial orbs as He pleased, and in moving them He impressed in them impetuses which moved them without His having to move them any more except by the method of general influence whereby He concurs as a co-agent in all things which take place; "for thus on the seventh day He rested from all work which He had executed by committing to others the actions and the passions in turn." And these impetuses which He impressed in the celestial bodies were not decreased nor corrupted afterwards, because there was no inclination of the celestial bodies for other movements. Nor was there resistance which could be corruptive or repressive of that impetus. But this I do not say assertively, but rather tentatively so that I might seek from the theological masters what they might teach me in these matters as to how these things take place.

Of this passage Fr. Jaki says that Buridan's statements "anticipate Newton's first law of motion." We grant that they do and we go farther than Fr. Jaki and protest that they do so by removing the Angels as movers of the celestial bodies. There is more physics behind this agency of the Angels than Fr. Jaki would ever tell us, but we will come to that shortly.

⁶ Stanley L. Jaki, *God and the Cosmologists*. Regnery Gateway, **1989**, 11. 197-198.

⁷ Stanley L. Jaki, *The Savior of Science*. Regnery Gateway, **1988**, pp. 52-53.

For now we will simply note that all the 14th century nominalist-empiricists, of which Buridan must be taken as but one representative, were dealing with matters of metaphysics and theology **without fully realizing it**, and consequently, they attribute to moving bodies powers that these bodies do not always have.

For example, Buridan attributes the movement of the heavenly bodies to nothing more than the "method of general influence" by God. But this is a very weak statement, indeed, of the truth of things. The primary agency of God is not well described as a "method of general influence." First of all, God's primary agency is not a method, because God does not act in any case by processes, and all methods are processes. Only His creatures are limited by the requirements of temporal action and the changes that all processes involve. Secondly, it gives us only the faintest of inadequate ideas of the absolute necessity, both physical and metaphysical, for God's primary agency in all things. However, we must admit that Buridan's explanation is far superior to that of Galileo. We will turn now to that. Stillman Drake, an acknowledged authority on Galileo's life and work, points out the following passage from Galileo's *Letters on Sunspots* (1613) as the first announcement of the principle of inertia. Here is what Galileo says in the translation by Drake:⁸

But if anyone should wish to have the rotation of the spots around the sun proceed from motion that resides in the ambient and not in the sun, I think it would be necessary in any case for the ambient to communicate this movement to the solar globe as well. For I seem to have observed that physical bodies have physical inclination to some motion (as heavy bodies downward), which motion is exercised by them through an intrinsic property and without need of a particular external mover, whenever they are not impeded by some obstacle. And to some other motion they have a repugnance (as the same heavy bodies to motion upward), and therefore they never move in that manner unless thrown violently by an external mover. Finally, to some movements they are indifferent, as are these same heavy bodies to horizontal motion, to which they have neither inclination (since it is not toward the center of the earth) nor repugnance (since it does not carry them away from that center). And therefore, all external impediments removed, a heavy body on a spherical surface concentric with the earth will be indifferent to rest and to movements toward any part of the horizon. And it will maintain itself in that state in which it has once been placed; that is, if toward the west (for example), it will maintain itself in that movement. Thus a ship, for instance, having once received some impetus through the tranquil sea, would move continually around our globe without ever stopping; and placed at rest it would perpetually remain at rest, if in the first case all extrinsic impediments could be removed and in the second case no external cause of motion were added.

One detects elements of Aristotelian motion in Galileo's opinion that the ambient would communicate movement to the sun, as being in contact with it, as well as in the "natural" inclination of bodies downward toward the center of the earth and a repugnance to moving upward. But that any object would continue to move perpetually on its own motive power -- this is anti-Aristotelian and pro-Newton. The principle of inertia postulates the possibility of perpetual motion **without** a

⁸ *Discoveries and Opinions of Galileo*. Transl. with an **Introduction and Notes** by Stillman Drake. New York: Doubleday Anchor Books, 1957, pp. 113-114.

perpetual mover. And this has never been demonstrated. That Galileo was wrong about the nature of sunspots does not concern us here. Our focus is on Galileo's conceptions of motion. Here is what Stillman Drake says about the just-quoted passage:

*The importance of this paragraph to the history of modern physics cannot be exaggerated. What it contains is the first announcement of the principle of inertia, according to which a body will preserve a state of uniform motion or of rest unless acted upon by some force. Galileo's explicit statement of this principle is confined to the cases of 1) rotating bodies and 2) heavy bodies moving freely upon smooth spheres concentric with the earth. In applying the principle to physical problems, however, he included the more important case of bodies moving uniformly along straight lines, neglecting the force of gravitation. But even in such cases Galileo restricted his inertial principle to terrestrial objects. He did not, as is sometimes stated, attribute the orbital motions of the planets to an inertial principle acting circularly. In fact he did not attempt any explanation of the cause of planetary motions, except to imply that if the nature of gravity were known this too might be discovered (*Dialogue*, p. 235). The achievement of this prodigious step remained to Newton.*

It seems rather plain to me that Galileo did apply his conceptualizations of motion to the heavenly bodies, but, I would not wish to contest Drake's judgment on this point.

Galileo formulated the inertial principle more or less clearly in his *Dialogo* of **1632** and in the *Discorsi* of **1638**. The *Dialogo* was mainly concerned with his defense of the Copernican astronomy, but after the condemnation of **1633**, Galileo returned to his earlier studies in mechanics. That the study of motion interested him immensely and was perhaps his primary fascination may be seen from what he says about his projected works in a letter of **1610** to the Duke Cosimols secretary, Belisario Vanta. I cannot resist quoting it at some length because it shows so well the kind of man Galileo was. He thought of himself as something of a new Aristotle:

The works which I must bring to conclusion are these. Two books on the system and constitution of the universe -- an immense conception full of philosophy, astronomy, and geometry. Three books on local motion -- an entirely new science in which no one else, ancient or modern, has discovered any of the most remarkable laws which I demonstrate to exist in both natural and violent movement; hence I may call this a new science and one discovered by me from its very foundations. Three books on mechanics, two relating to demonstrations of its principles, and one concerning its problems; and though other men have written on this subject, what has been done is not one-quarter of what I write, either in quantity or otherwise. I have also lesser works on physical topics, such as treatises on sound and the voice, on vision and colors, on the ocean tides, on the nature of continuous quantities, on the motions of animals, and yet other works. I have also in mind the writing of some books about military matters, setting these forth not merely theoretically but showing by very elegant rules everything in that science which depends upon mathematics, such as the practice of fortification, ordnance, assaults, sieges, estimation of distances, artillery matters, the uses of various instruments, and so on. I must also reprint my instructions for the use of the military compass (dedicated to His Highness), as no more copies are

*available, and this instrument has become so popular in the world that other devices of the kind are no longer made, while I have manufactured thousands.*⁹

Reading post-medieval, **post-14th** century descriptions of motion, one enters an entirely different universe of discourse than that of the medievals. E. A. Burt was very much mistaken when he said that man was the "all-important, even controlling fact in the universe" for the medievals.¹⁰ As I hope to show in this paper, it was not man but God Who held the central and all-controlling place in the universe and must hold it again in the minds of modern men if the world is ever to come right.

Scholars cannot define Galileo's conception of motion precisely and they differ about it because, like many others, even Newton, Galileo was speaking of God's primary causality but in a veiled, ambiguous and evasive way, trying all the while to find natural explanations. In the same way, our 20th century evolutionists attempt to explain the existence and order of creation by merely natural processes. It therefore seems imperative that we, especially we Catholics, return to the philosophical theology of St. Thomas. Some small beginning of that will be attempted in the following pages.

Summing up his analysis of Galileo's notion of inertia, Ernan McMullin targets the essential point when he speaks of the ontological difference between Galileo's explanation of motion and that of John Buridan:

*... three commonly made claims about Galileo and the principle of inertia seem worth disputing. One is that he at no time formulated it adequately. He was not so consistent about it as Descartes, but he did formulate it and use it correctly. The second is that Galileo moved from an imperfect understanding of inertia in the **Dialogo** to a clear formulation of it in the **Discorsi**. It is true that the rectilinear character of inertial motion is established in the **Discorsi**, but it is in the **Dialogo** that the inertial character of the motion receives its clearest formulation. Finally, the contrast often drawn on ontological grounds between Galileo's understanding of inertia and Buridan's **of impetus is not sound**. Galilean mechanics **implicitly contain** the beginnings of a **radically new** ontology of motion and causality. But Galileo was concerned to put first things first; because he had voluntarily confined himself to kinematic issues, it was unnecessary for him to reshape the causal metaphors of **impeto** that he had inherited from his teachers. He was still groping in a tangle of such terms as '**momento**,' '**velocita**,' '**motu**,' '**virtu**,' for the clue he needed to convert his kinematics into a dynamics. **The ontological consequences of the new motion***

⁹ Idem., pp. 63-64.

¹⁰ E. A. Burt. *The Meta-physical Foundations of Modern Physical Science*. Rev. ed. Humanities Press, 1932. pp. 17-18. Burt says:

The prevailing world-view of the period was marked by a deep and persistent assurance that man, with his hopes and ideals, was the all-important, even controlling fact in the universe.

This he gives as the "central metaphysical contrast between medieval and modern thought, in respect to their conception of man's relation to his natural environment". Man's centrality is far more characteristic of the Renaissance and serves to mark the departure of man from Christendom into the more and more Godless universe of modern man who has ended by deifying himself as the one who controls both life and death. It would be difficult to imagine a mentality farther removed from the medieval "Age of Faith".

*of impeto will not be clearly realized until Newton's Principia makes them explicit.*¹¹
(Emphases added.)

Ernan McMullin would not agree with my contention that there **is** a contrast drawn on ontological, i.e., metaphysical grounds, between Buridan's statement and those of Galileo about motion. Buridan's statement is weak -- and we will see just how weak it is when we examine the matter according to St. Thomas -- but it still contained an acknowledgment of the necessity for God's primary causality. There is no such acknowledgment in Galileo anymore than there is in Newton.

The **separation between science and Faith** is what we are looking at here, because just as Galileo privately believed in God as the Creator of heaven and earth, so too did Newton profess belief in a Deity Who was "the Author of the system" of the world. He even admitted that the formation of the celestial bodies was "not explicable by natural causes but must be due to the "counsel and contrivance of a voluntary Agent." These admissions and professions of faith are made in his letters to men such as Richard Bentley and Thomas Burnet. Newton, moreover, still held some theory of impetus, as he wrote to Bentley in **1693**:¹¹ ... I represented that the diurnal rotations of the planets could not be derived from gravity, but required a divine arm to impress them." And again in **1693**, to Bentley, he protested: "You sometimes speak of gravity as essential and inherent to matter. Pray do not ascribe that notion to me, for the cause of gravity is what I do not pretend to know and therefore would take more time to consider of it."¹²

However, when Newton formulated his Axioms, or Laws of Motion in the *Principia* in **1687**, there is **not the slightest hint of acknowledgment of divine causality** at work anywhere in nature. This shows that the realization of the **absolute necessity** for God's primary causality in the agency of all secondary causes has been lost. Charles Singer puts it as starkly as the reality requires when he says:

*The full extent and revolutionary character of the change that Newton was working in men's minds was not at first recognized even by himself, but it became apparent in the course of the eighteenth century. The essential revolutionary element was that Newton had conceived a working universe **wholly independent** of the spiritual order. This was the **profoundest break** that had yet been made with all for which the Middle Ages stood. With Newton **there set in an age of scientific determinism.***¹³ (Emphases added)

And so, just as with Galileo, however firm might have been Newton's private beliefs in a Creator-Deity, this same God had **no intrinsic connection** with the universe He created. Paley's watch-maker was indeed an apt analogy for the Deistic relationship of God to the universe; for just

¹¹ *Galileo, Man of Science*. Edited by Ernan McMullin. Princeton Junction, NJ: The Scholar's Bookshelf, **1967**. Originally published in **1967** by Basic Books. The quotations are taken from Ernan McMullin's "Introduction" to this collection of essays about Galilean science.

¹² *Newton's Philosophy of Nature: Selections from his Writings*. Edited and Arranged with Notes by H. S. Thayer, New York: Hafner Pub. Co., **1953**, pp. 47, 53, 57.

¹³ Charles Singer. *A History of Scientific Ideas*. New York: Dorset Press, **1959**, p. 294. Originally published as *A Short History of Scientific Ideas to 1900*.

as a man makes a watch and may then die with no consequences for the watch, so the God of the Deists, the God alike of Galileo and of Newton, could retire from His Creation with no consequences. But the case is very much otherwise as we will see most clearly, I hope, when we come to examine the truth about motion and things in motion.. Here, then, is Newton's First Law:

Every body continues in its state of rest or of uniform motion in a right line unless it is compelled to change that state by forces impressed upon it.

And he continues with a paragraph of explanation:

*Projectiles continue in their motions, so far as they are not retarded by the resistance of the air or impelled downward by the force of gravity. A top, whose parts by their cohesion are continually drawn aside from rectilinear motions, does not cease its rotation otherwise than as it is retarded by the air. The greater bodies of the planets and comets, meeting with less resistance in freer spaces, preserve their motions both progressive and circular for a much longer time.*¹⁴

In *Newton's First Law*, the impetus attributed to God at creation and continued by Him as co-agent in all things that take place has become the plural and impersonal "forces" of some unexplainable natural process. It seems also worthy of note than in this first law, Newton stops just short of attributing a natural motion **in perpetuity** when he says that the heavenly bodies "preserve their motions both progressive and circular for a much longer time." How much longer, one wonders, would he allow them?

Newton's Second Law is even more explicit in its reference to impetus or impressed force, but there is **not a hint** that God could be involved **in any way** in this "motive force."

Ernan McMullin says that there are two ways in which one might try to define the term "inertial motion":

1) as a motion which began as "forced" but continues indefinitely, once all impeding factors are removed, and

2) as a motion "under no forces," i.e., for whose stable continuance neither extrinsic nor intrinsic causes need be postulated.¹⁵

Both of these definitions imply perpetual motion with no cause. Such is the state of irrationality which modern minds are able to attain and remain with, in apparent contentment.

But there are some signs of discontent. David Knight defines and **explains Inertia** this way:

Inertia is the resistance bodies put up to any force changing their velocity; it is the characteristic of matter, expressed in terms of what we call Newton's first law of motion: "All bodies continue in a state of rest or uniform motion unless a force acts upon them."

This is not very plausible, and its adoption was one of those triumphs of science over common sense: we see everything slow down and come to a halt unless a force (provided by the engine of a car or train, for example) keeps it going. **In the physics of Aristotle and his school all motion required a cause;** and yet even in Antiquity there were cases of motion

¹⁴ *Newton's Philosophy of Nature*, as above in #12, p. 25.

¹⁵ *Galileo, Man of Science*, p. 27.

that continued without a mover -- arrows and thrown stones, for instance, and objects falling to the ground.

*Falling bodies were seen as moving, with increasing rapidity depending on their weight, towards the centre of the Earth. The 'natural place' of all heavy things; while light fiery sparks fly upward. **In the sixth century A.D. John Philoponus of Alexandria** dropped weights from a tower and found that their speed was not proportional to their weight; so the exact law of falling remained a mystery. Even more perplexing was the problem of the motion of projectiles; but in the thirteenth and fourteenth centuries, Jean Buridan and Nichole Oresme in Paris worked out a theory of 'impetus' to explain it.*

The bowstring of the sling imparted impetus to the missile, which was gradually used up in its flight; when it was all gone, the projectile fell straight to the ground. Similarly, a falling body gained impetus so that it went faster and faster. This theory prevailed down to the early seventeenth century, when Galileo was making sense of the motions of planets following Copernicus' view that they circle the Sun. If the centre of the Earth was not the centre of the universe, and was moving, then there seemed no good reason why it should be the natural place of all heavy bodies; Galileo did not concern himself with the cause of falling, but suggested that the law was that falling bodies were uniformly accelerated, following an equation worked out three hundred years before by mathematicians at Merton College, Oxford. This is a classic case of a scientist avoiding a 'why' question and tackling a 'how' question.

*For the motion of planets, Galileo had to give some explanation: he believed that in the absence of friction, a ball bowled would go rolling right around the Earth, and that similarly the Moon rolled around us, and we around the Sun. **This circular motion was thus inertial**, requiring no force; which pleased him, because he could not believe in forces acting at a distance across void spaces. Descartes in his **Principles of Philosophy** modified this idea, musing on the unchangeability of God; and concluded that inertial motion must be straight-line rather than circular. Given this principle as the basis of his physics, Newton had to account for the closed orbits of the planets, which are ellipses and not circles; and came up with his theory of gravity.¹⁶*

This is as neat a summary as one could wish for, and it raises many more questions than it answers. In fact, when compared with medieval physics and cosmology, it is really quite lacking in consistency and intelligibility. One suspects that David Knight knows that his account is sorely lacking in the coherence that sanity and rationality demand. There is a hint of satire in the entire passage of four paragraphs.

However, we must insist that in our invitation to reconsider medieval explanations of motion and cosmology, there is no question of turning back the clock but simply of restoring truth where error and confusion reign. Nor is it a matter of theology trespassing on the sacred territory of Science. The scholastic dictum applies here: **distinguish but do not separate**. The sciences reflect the same order as the reality they study. They are hierarchically arranged in the order of creation and of nature given by God. All the sciences are therefore related to philosophy and to theology in a real

¹⁶ David Knight. *A Companion to the Physical Sciences*. London and New York: Routledge, 1989, p. 80 ff.17.

relation of subordination. Just as the truths of Faith enlighten all the actions of our lives, so the same truths of Faith and principles of metaphysical science enlighten all the other lower physical sciences and their lesser objects of knowledge. But when the higher truths are eliminated, as has happened with the world of modern science, there is bound to ensue a chaos of unrelated information.

Although Newton uses the concept of impetus in the formulation of his Laws of Motion, it is the opinion of most scholars that its reference is entirely different from that of the medievals.

Fr. James Weisheipl, O.P., says that the best scholastic minds did **not** think that their theory of impetus **eliminated causal explanations** of motion as a process, which is the Aristotelian-Thomistic conception of motion. This is the crux and the key to the whole subject.

*The best scholastic minds did not, in fact, explain the projectile as a self-mover ... They did not explain **impetus** as a **motor conjunctus**, a mover accompanying the body. And they did not think that impetus eliminated causal explanations of motion as a process. As far back as 1940, Anneliese Maier clearly showed that the scholastic theory of impetus had **nothing whatever in common** with the principle of inertia*¹⁷ (Emphases added)

The scholastic theory of the impetus could not have anything to do with the principle of inertia because motion, by the scholastics, was seen as a process that necessitates causality and specifically, the primary causality of God acting in all things.

Motion is that natural process, so evident to the senses, that St. Thomas used it as the starting point for his first proof for the existence of God. Causal explanations of **motion** as a **process -- it is not a state --** are the only explanations that lead the mind by way of natural truths to God. The **mathematization of motion**, as was accomplished as early as the 14th century at Oxford by the Franciscan Thomas Bradwardine and others, and then later by Galileo, Descartes and Newton, effectively **closes off the road that leads to God** by way of observed physical motion.¹⁸

¹⁷ James A. Weisheipl, "Galileo and his precursors", in *Galileo, Man of Science*, p. 89.

¹⁸ The tendency to deal with nature **in mathematical terms** is, of course, of ancient origin, and it is probably due to temperament and talent that some men have more of a leaning toward mathematics than others. Thomas Bradwardine, O.F.M., was a **mathematical genius** who, in the words of one scholar, would have wanted to write the *Principia mathematica naturalis* of his century. "It was he who introduced mathematics into scholastic philosophy, initiated the two new sciences of kinematics and dynamics, and made the initial move toward uniting celestial and terrestrial motions under a single mathematics. In a burst of enthusiasm reminiscent of Robert Grosseteste, Roger Bacon and Galileo, Bradwardine declared:

It is (mathematics) which reveals every genuine truth, for it knows every hidden secret, and bears the key to every subtlety of letters; whoever, then, has the effrontery to study physics while neglecting mathematics, should know from the start that he will never make his entry through the portals of wisdom.

Galileo, Man of Science, p. 94 ff. This passage is indeed Galilean in its tone and in its content, for Galileo, too, was very frequently known to castigate the "philosophers" and the "Aristotelians" for their ignorance of mathematical "demonstrations".

In *The Assayer* of 1623, Galileo wrote:

Philosophy is written in this grand book, the universe, which stands continually open to our gaze. But the book cannot be understood unless one first learns to comprehend the language and read the letters in which it is composed. It is written in the language of mathematics, and its characters are triangles, circles, and other geometric figures without which it is humanly impossible to understand a single word of it; without these, one wanders about in a dark labyrinth.

The **only way to re-open** that road is **to restore** the philosophical theology of St. Thomas Aquinas. This paper is an invitation to begin such a restoration.

In any defense of the Aristotelian-Thomistic philosophy of motion, two main aspects of the subject must be examined in some detail, and it is not always easy to keep them separate. They are: **1) the nature of motion itself, and 2) its causes, both primary and secondary.**

Aristotle and St. Thomas following him define motion as **the passage from potency to act.** Motion as such is neither total being, actuality, nor total non-being or potentiality, but something **intermediate** between the two with **a degree** of actual existence.

Motion, or change, is a property of all created beings. Even the Angels, who have no matter in their being but are simple and incorporeal, pass from potency to act in their knowledge and in their operations. Angels are composed of two immaterial principles, potency and act, that that is all that is required for change to take place. Corporeal beings, like us, are composed of matter and form. Matter is the principle of potency and form is the principle of act. All the actuality of composite beings comes from their form as from the source, so that it is the formal principle of every composite being that directs all its motions, all its changes, and is, therefore, primary with respect to the material principle. It is the form of a being that **directly and immediately receives the agency of God as primary cause** and the agency of other beings acting as secondary causes. Moreover, the primary agency of God is **absolutely necessary** in order that the being of any and all individuals be sustained in existence and empowered to act through their forms. This can be proved in several ways, but the most obvious is the fact that **no created being is able to sustain itself** in existence because it is, by its very nature as created and finite, **contingent**, that is, absolutely dependent upon the First Cause, God, for its existence and its actuality.

Back to the nature of motion. Motion is a property of all created beings. There is no such thing as absolute motion or absolute change because there is no such thing as motion or change apart from the being which moves and changes. The **mathematization** of motion **creates the illusion** of absolute motion and time and space, but that's because mathematics abstracts to pure quantity **from the total complexity** of the individual being. It's a simplification that people like Copernicus and Galileo and Newton and Einstein enjoy and find **easy to manipulate**. But it is the extrapolation of one and only one aspect of reality. By itself, therefore, it **cannot** give us a true representation of reality.

Furthermore, **becoming**, as such, is **not like being**, intelligible by itself. Fr. Garrigou-Lagrange says:

^{18(cont'd)} *Discoveries and Opinions of Galileo*, Transl. by Stillman Drake, p. 237-8.

Galileo was certainly a kindred spirit of Fr. Thomas Bradwardine, and they both were kindred spirits of Plato and the ancient Pythagoreans. The entire inspiration of modern science is really Pythagorean and Platonic, pagan in essence.

Scholars are turning up more and more texts that prove the origins of modern science to lie precisely in the rejection of Aristotelian-Thomistic philosophical theology, and in some marked emphasis of the Platonic or Neoplatonic traditions. For Aristotle and St. Thomas, **mathematics** is situated midway between simple apprehension and metaphysical abstraction; it is the "second degree of abstraction" and as such, needs constant reference to the concrete real and to the first principles of being. When it is elevated **as a science in itself**, rather than a tool of the sciences, and when its methodology is held to be the only way to truth excluding all others, then the **hierarchy of the sciences is destroyed**, truth is shattered, and the idol of scientism emerges from the ruins.

*Becoming is a successive union of diverse elements. This union cannot be unconditional, for diversity, of itself and as such, cannot be one. [There is no principle of identity in pure becoming.] Becoming is the transition from indetermination to determination, and hence presupposes a determinate cause; to deny this is to say that nothingness can be the cause of being, which is a denial of the principle of identity and a setting up in its place of the principle of Pantheism.*¹⁹ (Emphases added)

Evolutionism, too, **opts for pure becoming** without any underlying being as the subject of change, and thus **denies** the principle of identity as well as the principle of sufficient reason. And if God be brought in as continuous Creator, as the **theistic evolutionists** try to do, there is no way for such compromising evolutionists to escape from the fact that their God, too, is a pure becoming and indeterminate, dissolving into nothingness, for reason recognizes that there is always some proportionate likeness between the Cause and the effect, between the Creator and the creature. The truth of this is seen most clearly in the fact that God imparts active agency to His effects, enabling them to be efficient causes analogously to Himself. But the evolutionist who wants to bring God into the evolutionary process, **must reduce God Himself to a process**. And this is **pantheism**. But God alone is Pure Actuality, all Existence, Pure Act, with no trace of becoming, of change, or of potency, which latter is always a sign of the imperfection of need. All created beings, by the very fact of their creaturehood, are **composed of these two principles**, potency and act. Potency determines and limits what a specific motion is capable of arriving at in actuality. The limits are determined by the nature of the created being, and act is always the realization of **some specific potentiality** that flows from the nature of the being that changes.

Some examples come to mind. The first and second laws of thermodynamics are specifications, determinations of becoming in things, and are as much laws of nature as motion itself. They specify and determine that while all the matter of the universe remains quantitatively the same, there is in every process or kinesis -- motion taken in its broadest sense -- some loss of the available energy. The **1st law of conservation of energy** [refer to Appendix, p.48], mysterious as it is, affirms in scientific terms, the Genesis account of creation. After the Six Days, God rested from all the work that He had done. There is **no new creation** except in the supernatural order of divine grace. There are no new natural beings except for the individual human souls. And this is the key to the **1st law**. There is **no new matter** but there are new souls and new arrangements of matter that souls inform. This is not nearly so true of animal souls as it is of human souls. Animals do not exhibit nearly the individual uniqueness that human beings do. Anyone who has lived with cats, dogs, horses, etc., can verify this. The slight differences we observe and call "personality" in animals are due entirely to accidental differences of material formalities and not to the animal soul as such which is transmitted with its matter; thus its matter is the only basis for individual differences. All dogs wag their tails when happy and all dogs slurp inside their mouths when sensually content, just as all cats purr when content and yawn when pleased. Examples of so-called

¹⁹ Rev. R. Garrigou-Lagrange, O.P., *God: His Existence and His Nature. A Thomistic solution of certain agnostic antinomies*. Transl. from the 5th French edition by Dom Bede Rose, OSB. 2 vols. London and St. Louis: B. Herder Book Co., (1914, 1915, 1927) 1034, pp. 281-2, in Vol. 1.

"personality" differences could be multiplied *ad infinitum*, but in the last analysis the only difference between one cat and another is material.

But it is entirely otherwise with the human being. We differ both as to soul and to body and are thus doubly unique even within the limits of human nature. Only the unique and newly created human soul can explain the differences that we encounter in one another, even though we are all bound by the limiting potentialities of human nature.

Aristotle says in the beginning of the third book of his *Physics* that Nature is defined as a principle of motion and of change. We may ask, as many scientists of today do ask, whether there is anything in matter except change? Is not matter, as such, constantly in a state of motion? Many today believe that motion is all there is because matter is continually in motion. But again, this is to abstract becoming from the being that is the subject of change. We can not see and touch and feel the being or nature that is the recipient of change, nor do we see and touch the form that directs and controls the change, as the principle of actuality and stasis. All that we can see and touch and smell and taste and hear are the physical properties of being, properties that are full of potentialities for new actualities and thus are always in some process of becoming. But reason demands that the processes of becoming have a determinate cause and a determinate end, that processes issue in some new state of being.

The evolutionary mechanists of today tell us that chemical laws and processes are the same in all material beings, that there is no difference at all between, say, the digestive processes of the plant, the animal, and man, that all are governed by the same chemical laws. This is a question which I invite all Creationists to research. Experience with animal implants seems to prove that an animal organ will not function in a human body. The human body will "reject" it. The reason for this has to be the **primacy and unicity** of substantial form. The form that animates an animal liver, for example, is not the same but rather, is **different in kind** from the human liver. This is because the substantial form or rational soul which informs the human body and gives it its life, making it to be what it is, i.e., **human**, is **radically different** from the animal soul. It would even seem that so unique is the human soul that it will not tolerate the organ of another human being, at least not for long. There is only one substantial form or soul in the human being, and this soul subsumes into its own activity all the other operations of the body. However, if a formality is introduced into the body that is alien to the one substantial form that vivifies and unifies that person, then that alien formality will be rejected. This seems to be the case so far with all human as well as animal implants. Big subject for research on philosophical/theological grounds! As Solange Hertz has suggested, is not the implantation of human organs a form of cannibalism?

Aristotle distinguished two main kinds of change or motion: natural and violent. Natural motion is that which is **initiated within a being** and violent motion is **initiated from without**. Some examples come to mind. Growth is a natural process of augmentation both qualitatively and quantitatively, and even though nutrients are provided from outside the organism, there must be an **active** principle within the organism to initiate and maintain the utilization of those nutrients. Cells multiply and **develop dispositions** that turn out to be the qualities of the person or animal. Decay, on the other hand, is a process of gradual de-composition, the opposite of growth, but I wonder if it is not mainly quantitative. Physical qualities such as color, sound, smell and taste so easily reduce to quantity, at least for the modern scientist, but virtue is the type of quality, and this cannot be reduced to quantity. It is a spiritual quality of the soul. As the body falls apart under the weight of years, wisdom and virtue remain and intensify in the holy person, as we see in all the saints. Virtue

is also the very type of change from within. All changes of growth and decay take place within an organism and under the influence of a constant struggle between matter/flesh and spirit.

A kind of intermediate case between natural-interior change and violent-invasive change might be that of a person who is discovered to have cancer. As far as the scientists know, cancer is caused by some disorder in the cell. It may be that the disorder is triggered by the presence of some carcinogenic agent introduced from outside, as in food or from the air, an element which the body's immune system is unable to eliminate or protect against because of some weakness either of soul or of body. Sickness is always an effect ultimately of Original Sin and of our personal sins in general, although we may not ascribe personal sin as the cause of any particular sickness. Little children born with AIDS because their parents transmitted the disease to them, are innocent victims. The Little Flower, St. Therese of Lisieux, died consumed with tuberculosis, but she never committed even a deliberate venial sin. Her sickness was due in fact to sin because she was a victim soul atoning for the sins of others.²⁰ In any event, the cancerous cell or the tubercular cell become diseased because some agency within the body is defective, that is, fails in some way to cope with the disorder. So illness must be considered, it seems to me, a natural change as originating within the body.

God's action in the natural order as also in the **supernatural** order of grace, is always interior, immediate, most intimate, and gentle though entirely efficacious. Only in the supernatural order of grace can God's action be rejected by man's free will. God's action, His active agency, in the natural order, is precisely and alone what preserves all beings in existence and activates the natural agency of secondary causes.

Violent motion is initiated from outside a thing by some external agent, and it is this kind of motion that brought about the rejection of Aristotelian physics in the 17th century along with the metaphysics and theology that St. Thomas had incorporated into the Catholic system.

From Aristotle's works, especially his *Physics*, there came to be formulated three main principles or laws of motion:

- 1) whatever is in motion, is set in motion by another;
- 2) in any series of actually and essentially subordinate movers, such as we observe in the hierarchical order of nature, there can be no regress to infinity; and
- 3) there is no action at a distance, i.e., mover and moved are always in physical contact.

It was this third principle that occasioned so much dispute amongst the philosophers of nature in the 14th century and from thence onwards, especially as Aristotle had brought it to bear upon "violent" projectile motion.

Fr. Garrigou-Lagrange, writing long before the rise of Fr. Jaki to prominence but contemporaneously with Jaki's hero, Pierre Duhem, speaks of the impetus theory as something quite

²⁰ For a lengthy discussion of this subject, see my paper *Entropy and Eden*, available from P. Ellwanger, 1834 E Peters Colony, Carrollton, TX 75007.

familiar to St. Thomas (d. 1274) whereas Fr. Jaki would seem to make it original with John Buridan (fl. 1358):

*It is true that the Aristotelian idea of motion, which is **applied without difficulty** to either qualitative or augmentative motion, cannot at first glance be easily reconciled with the motion of projectiles which continues after their impulsion.... The explanation given by Aristotle is obscure; he has recourse to the propulsive elasticity of the circumambient air, which would sustain the projectile in motion. St. Thomas is much clearer when he states that there is in the projectile **a force or instrumental-power** imparted to it by the principal agent.²¹ (Emphases added)*

The footnote to this passage must also be given wherein St. Thomas says:

*An instrument is said to be moved by the principal agent, so long as it retains the power imparted to it by the principal agent; hence an arrow continues on its course so long as it retains the impulsive force imparted to it by the projector. (**De Potentia**, Q 3, a 11, ad Sum.)*

The **instrumental power** is the key to projectile motion, and I imagine St. Thomas was thinking here of God's primary causality as it operates in secondary causes, for in another place he says that "secondary causes or movers only move insofar as they are moved by a first mover, as a stick does not move **except** insofar as it is moved by the hand."²²

The human thrower of the ball or an archer may impart a bit of instrumental power to the ball or the arrow, but it quickly dwindles as the force of the initial contact fades. God's agency, however, never diminishes, keeping both human agent and projectile in existence and in potency to further actuality as the initial actuality fades. The actuality thus decreases and moves back into potentiality in proportion to the decrease of the initial motion. Perhaps this ratio of movement could be mathematically expressed without detriment to Aristotle's principles and the primary causality of God.

In all discussions of impetus and impressed force a distinction must be made between the **primary cause** Who is God and the **secondary cause** to which He imparts the actuality necessary to bring any potentiality into actuality. All motion, of whatever kind, is due, as an effect, **both** to God and to the natural agent or secondary cause, though in different ways.

What Buridan referred to as "the method of general influence whereby He [God] concurs as a co-agent in all things which take place" does not begin to give us an adequate idea of God's immanent activity in secondary causes. As noted before, it is **not a method, not a process, but act alone**, and therefore, even the word activity may be misleading.

But before going on to a detailed examination of the relation between God as primary cause and secondary causes, we may conclude a discussion of impetus and the principle of inertia with the following by Fr. Garrigou-Lagrange:

*It has been admitted by a number of Scholastics and some Thomists,...that the initial impulse generates in the projectile an **impetus**, a force capable of serving as a motor. This*

²¹ Rev. R. Garrigou-Lagrange, *op. cit.*, Vol. I, p. 274.

²² Quoted by Herbert Thomas Schwartz, T.O.P., "The Five Demonstrations of the Existence of God" in *Summa Theologica* of St. Thomas. New York, Benziger Brothers, **1948**, in 3 Volumes. Vol. 3, p. 3139.

*explanation safeguards the universal principle that "whatever is moved, is set in motion by another." In fact, as Goudin remarks, "by reason of the impulse given to the projectile it is not at the same time and in the same sense in potentiality and in act; it actually has this impetus, but it is **in potentia** with regard to the position towards which it is tending." In other words, the projectile is in act so far as the dynamic properties are concerned, and **in potentia** with regard to its future position in space. Thus all contradiction is avoided. This idea of an impetus, which may be mathematically expressed as a vital force, seems destined to play an essential role in the metaphysics of local motion, the purpose of which is to show that the principle of inertia, as to what there is of experimental truth about it, is itself subordinate to the principle that "there is no change without a cause."*

For the rest, the principle of inertia, insofar as it affirms that an imparted motion continues without a cause, cannot be verified by experience.

And again, we must quote the footnote to this passage:

The principle of inertia is incontestably true, insofar as it affirms that inanimate bodies are of themselves incapable of modifying their state of rest; in truth, only living organisms are able of themselves to act and set themselves in motion. But that the motion once imparted to a body continues indefinitely, is a convenient fiction for representing certain mathematical or mechanical relations of the astronomical order; from the philosophical point of view it is seriously to be contested.²³

The saintly Dominican puts it very mildly. H. T. Schwartz is more confrontational when it comes to Newton's First Law:

Where St. Thomas says that nothing is moved unless it is moved by another, Newton says that Motion continues unless it is stopped by something else. Where St. Thomas says that motion is for the sake of the end in which it terminates, Newton teaches that motion is as much an end as its term. [Motion as a state] Two doctrines could not be more sharply opposed. And evidently, just as St. Thomas' concept of motion leads to God, the modern notion would make God superfluous in the understanding of nature -- because it makes motion self-explanatory.²⁴

Schwartz brings out also the necessity for consideration of **final cause** in any study of motion, because no being undertakes a motion without an intention as to its end.

From all this we can see most clearly that modern and Newtonian explanations, rather, descriptions of motion are very far from being self-explanatory or even intelligible. As Schwartz points out, "Since the time of Newton it has been a habit of thought to think of motion as something which just is, like anything else." But before our minds could be so conditioned, those same habits of thought had to have been cultivated by the minds of those men who were close enough to the medieval mentality to have known better. But due to a convergence of unhappy circumstances, they

²³ Rev. R. Garrigou-Lagrange, *op. cit.*, Vol. I, pp. 274-5.

²⁴ Herbert Thomas Schwartz, "The Five Demonstrations of the Existence of God" in *Summa Theologica* of St. Thomas. New York: Benziger Brothers, 1948, in 3 volumes. Vol. 3, p. 3137. Schwartz' entire exposition of motion is so good that I'm tempted to incorporate it in this paper, but consideration of space and reader patience deter me.

chose to forget the Primary Cause and the Final Cause of all things, which is God, and the absolute necessity for His immanent agency in all things.

It was this forgetfulness of God and the concentration on merely material causes that constituted the **empiricism** that came to be in the Renaissance. As a result of this forgetfulness of God, too, they formulated scientific laws in mathematical terms that could appear **not to need God**, as well as laws such as Newton's that because of a certain learned abstruseness, convince people that they must be profoundly true. Martin Gwynn says this of Newton's *Principia*:

The Principia was published in 1687 and all the indications are that the publicity channels of that period were carefully orchestrated to ensure that it appeared with the maximum impact. Indeed, although no-one even claimed to be able to understand it fully, to judge it as anything but a masterpiece was from the earliest days something that could not be contemplated. "Rumours of the coming masterpiece had flowed through Britain the first half of 1687," writes Westfall. "When the young Swiss mathematician, Nicolas Fario de Duillier, arrived in London in the spring, he found intellectual circles aflutter with expectation of the book, which would, he was assured, remodel natural philosophy ... Almost from the moment of its publication, even those who refused to accept its central concept of action at a distance recognized the Principia as an epoch-making book. ,(28) This is remarkable in view of the fact that it is certain that no one understood it at the time, and that it is doubtful if anyone has ever understood it since. "Across the channel John Locke set himself to mastering this book. Since he was not a mathematician he found the demonstrations impenetrable.,' It is far more likely that he found them so because they were impenetrable. "Not to be denied he asked Huygens if he could trust the mathematical propositions. When Huygens assured him he could, he applied himself to the prose and digested the physics without the mathematics."

*In other words, Locke's acceptance of Newtonian physics was not based on logical proof but on blind trust. This was indeed a new and streamlined scientific method....*²⁵
(Emphases added)

What a **striking testimony** to the basic irrationality of a science that **excludes God** from its discourse!

Having discussed motion in what I hope is a somewhat adequate manner, we can turn now to the other main aspect of this question which is that of secondary causality.

In my **1988** paper, *Allegations* [against Fr. Anthony Zimmerman], on page five I made a statement that could be misleading. Speaking of secondary causes in the context of Rahner's "obediential potentiality", I said that if theistic evolution were plausible, "God would have to act as primary efficient cause in every case of generation." I should have said, "as sole efficient cause" and added, as creating, in the strict sense, with the emergence of every new species. In other words, Fr. Zimmerman's thesis **demand a continuous creation** on God's part, **which thesis is against** both Scripture and its traditional interpretation. It is also most blatantly against the Thomistic theology of creation. And this is because, in the theology of St. Thomas, **secondary causes are given their full**

²⁵ N. M. Gwynne, *Sir Isaac Newton and Modern Astronomy*, p.13, paragraphs N59 and N60. Privately printed. N. M. Gwynne, Woodbrook House, Killanne, Enniscorthy, County Wexford, Ireland. This paper may also be available from P. Ellwanger [see Note 20].

powers of acting but always within the limits of their created natures, even while **God remains**, of necessity, **the primary agent in all created action**. This is necessitated by the fact that no being can bring itself from potency to act; this can only be done by an agent already in act.

In his *Summa Contra Gentiles*, St. Thomas treats these subjects in great detail. Chapter 69 of Book III of that work is entitled: "Concerning the Opinion of Those Who Withdrew From Natural Things Their Proper Actions." St. Thomas finds at least twelve reasons why we may not withdraw from creatures their proper actions. Allow me to review them here.

1) Some have maintained that no creature has an active part in the production of natural effects. Thus, they would say, that fire would not heat unless God caused heat at the presence of fire, and they said the same thing of all natural effects. They also affirmed that no form, whether substantial or accidental, is brought into being **except by way of creation**. This would necessarily have to be the position of theistic evolutionists who say that God used evolution as His method of creating.

But **many absurdities** arise from this error. For as to the first, if no inferior/secondary cause, especially a corporeal or bodily one, is active, and if God works alone in all things, then there would be **no diversity** in things because God is not changed through His working in various things. But we see in fact that from the application of a hot body there follows not cooling but only heating, and from human seed is generated a man only. Therefore, the causing of inferior effects is not to be ascribed to the divine power alone or so as to withdraw the causality of inferior agents.

2) It is **contrary** to the notion of wisdom that anything should be done in vain, but if creatures did nothing at all towards the production of effects, and God alone wrought everything immediately, other things would be employed by Him **in vain** for the production of effects, and this is not compatible with the divine wisdom.

3) He who **gives** a principle, gives whatever **results** from the principle. Thus the cause that gives gravity to an element, gives it downward movement. Now to make a thing actual results from being actual, as we see to be the case in God: for He is pure act and is also the first cause of being in all things. If therefore He bestowed His likeness on others in respect of being, in so far as He brought all things into being, it follows that He also bestowed on them His likeness in the point of acting, so that creatures too should have their proper actions.

4) Perfection in the effect indicates perfection in the cause. Since God is the most perfect agent, things created by Him must receive perfection from Him. And to detract from the creature's perfection is to detract from God's divine power. It is due to its perfection of being that a creature is able to communicate to another some perfection that it has, such as life. But if it could not, by way of being a secondary cause, this would detract from the perfection of God's creation.

5) The order of the universe is constituted by the proper activity of each creature.

6) The nature of a cause is not known from its effect except in so far as this is an indication of its power which results **from its nature**. All knowledge of **the physical sciences** would thus be denied us if a creature could not be known from its own proper effects.

7) By induction it can be proved that **like produces like**. [This is a rare admission -- that proof can be obtained by induction. But in this case, it is confirmed by metaphysics, i.e., by deduction.] Now that which is produced in lower things is not a mere form, but a composite of matter and form: because every generation is movement out of something, namely matter, and to something, namely form. Therefore the producer must be not a mere form, but composed of matter and form. Therefore the cause of forms which exist in matter is not the separate species of things, as the Platonists

maintained, nor the active intellect, as Avicenna said, but an individual composed of matter and form. [Thus we maintain the proper active agency and efficient casualty of individual corporeal beings. And since it is proved by both deduction and induction that **like produces like**, and since God is not creating any new beings, for the order of creation was perfect at the end of Creation Week, **evolution, theistic or otherwise, is impossible.**]

8) Both the substantial form of a being and its accidental forms are empowered by God with their proper natural activity. The action of the substantial form [i.e., the vegetative, sensitive, rational souls] does not consist in disposing matter, because this is effected by alteration, for which accidental forms suffice. [The importance of this concession by St. Thomas is very important for the activity of certain parts of bodies such as the genes. If the actualities produced belong to that kind of change called **alteration**, which is accidental, i.e., not substantial or what we would consider affecting the very nature of the being, then the action of the genes and all of their resulting actualities belong to the sphere of accidental changes but always within and subject to the domination of the substantial form, for they can act **only by virtue of the substantial form**. For animals and human beings, **the only substantial change is death**. It is debatable whether or not plants undergo substantial change when they "die."]

9) Accidental forms can produce substantial forms inasmuch as they act instrumentally by virtue of the substantial forms. [Here St. Thomas uses the example, which today we know to be false, of the generation of "imperfect animals" from putrefaction in conjunction with the heat of the sun. But we can perhaps substitute for this example that of the artist who produces his sculpture by the instrumentality of his chisel, or the painter his picture by means of his brushes and colors, or the musician who produces his music by means of his piano.]

10) Corporeal substances are of the lowest kind, yet even the lowest body is not excluded from its proper activity. It is clear that a body cannot be wholly in actuality, since it is composed of matter which is the principle of potentiality, i.e., potential being, and form which is act. But a thing acts in so far as it is actual and in respect of its form. Accordingly, a body acts on a subject not by reason of its entirety but by reason of the form by which it works.

11) God is pure act and things are more or less distant from Him according as they are more or less in act or potentiality. Thus things approach to a likeness to God insofar as they have a form because they act inasmuch as they have a form, and are passive inasmuch as they have matter.

12) Accidents do not pass from one subject to another, but when a body gives heat to another, it does not give its own identical heat; but by virtue of the heat in the heater, another heat individually distinct becomes actual in the heated body, having been potentially therein before. The natural agent does not transmit its own form into another subject, but reduces the passive subject -- or the passivity in that subject -- from potentiality to act. Consequently we do not deny creatures their proper actions, although we ascribe all the effects of creatures to God as operating in all.

The next chapter, chapter 70, is entitled "How the Same Effect is From God and From the Natural Agent." I will give only the key sentences.

Two things must be considered in every agent: the thing itself that acts and the power whereby it acts: thus fire by its heat makes things hot. So the power of the lower agent depends upon the power of the higher agent in so far as the higher agent gives the lower agent the power whereby it acts, or preserves that power, or applies it to action: thus the craftsman applies the instrument to its proper effect, although he does not always give the instrument its form but simply puts it into motion. Consequently the action of the lower agent not only proceeds from its

own proper motion but also **through the power of all the higher agents**, for it acts by virtue of them all. And just as the lowest agent is found to be immediately active, so the power of the first agent is found to be immediate in the production of the effect, because the power of the lowest agent does not of itself produce this effect, but by the power of the proximate higher agent, so that the power of the supreme agent is found to produce the effects of itself, as though it were the immediate cause.... Accordingly, just as it is not absurd that one action be produced by an agent and by the virtue of that agent, so it is not absurd that the same effect be produced by the inferior agent and by God and by both immediately, **though in a different way**.

It is also evident that there is nothing superfluous if nature produces its proper effect and God produces it also, since nature does not produce it except by God's power. Also, in an earlier chapter, chapter 67, we have this remarkable statement about violent/projectile motion: It is clear that every action that cannot continue after the influence of a certain agent has ceased, is from that agent: thus the visibility of colors cannot continue after the action of the sun has ceased to enlighten the air; wherefore without doubt it is the cause of the visibility of colors. The same applies to violent motion, which ceases when the violence of the impelling force has ceased. Now, since God not only gave existence to things when they first began to exist, **but also causes existence** in them as long as they exist, **by preserving them in existence**, ...so not only did He give them active forces when He first made them, but is always causing those forces in them. Consequently, **if the divine influence were to cease, all operation would come to an end**. Therefore every operation of a thing is reducible to God as its cause

Besides ... every application of power to action is chiefly and primarily from God. For active forces are applied to their proper operations by some movement of the body or of the soul. Now the first principle of either movement is God. For He is the first mover, wholly immovable, as we have proved. Likewise every movement of the will whereby certain powers are applied to action, is reducible to God as the first object of the appetite, and the first willer. Therefore every operation should be **ascribed to God as its first and principal agent**.

Further ... in all ordered active causes, the causes that follow must always act by the power of the first: thus in natural things the lower bodies act by the power of the heavenly bodies; and in voluntary things all inferior craftsmen act in accordance with the direction of the master craftsman. Now in the order of active causes, God is the first cause, as we proved in First Book. Now the cause of an action is the thing by whose power it is done, more even than that which does it; even as the principal agent in comparison with the instrument. Therefore, **God is more the cause of every action than even secondary active causes**.

Further, every operator is directed through its operation to its ultimate end: since either the operation itself is its last end, or the thing operated, namely the effect of the operation. Now it belongs to God Himself to direct things to their end,...Therefore we must conclude that every agent acts by the power of God: and consequently, **it is He who causes the actions of all things**. (Emphases added)

These quotations should make abundantly clear, by contrast, the damage done to men's souls by the **ruthless excision of God** from descriptions of motion. Not only do the empiricists leave out God's primary causality; they also **omit any consideration of intention**, for every agent acts for an end. God has created **all things for His glory**, and man, in particular, for happiness with Him.

Granted St. Thomas is speaking as a theologian and it is not the business of the scientist to theologize -- though many today are doing just that! Both science and theology have their limits as do also theology and philosophy. In the Second Book of his *Summa Contra Gentiles*, chapter 4, St. Thomas says that the philosopher and the theologian **consider creatures in different ways**. What he says of the philosopher **could be applied also to the scientist of today**.

First, the theologian deals with creatures in so far as they **reflect a certain likeness to God**, whereas the philosopher/scientist considers them as they are in themselves.

Secondly, the philosopher considers such things as belong to creatures by nature, whereas the theologian considers creatures **as they are related to God**.

Thirdly, the same creatures may be considered by both the philosopher and the theologian, but their knowledge is conveyed by different principles. For the philosopher/scientist takes his argument from the proper causes of things, but the theologian takes his **from the first cause**, which is God. Hence, theology ought to be called **the highest wisdom**, since it treats of the highest cause. And therefore, **the human sciences serve Theology as the first Wisdom**.

Fourthly, the two kinds of teaching, theology and philosophy/science, do not follow the same order. For in the teaching of philosophy/science, which considers creatures in themselves and leads us from them to the knowledge of God; but in the teaching of theology, which considers creatures only in their relation to God, **the consideration of God comes first**, that of creatures afterwards.

In Chapter 3 of this same Book II of the *Summa Contra Gentiles*, St. Thomas considers that knowledge of the nature of creatures, which is the science of philosophy and the physical sciences, serves to destroy errors concerning God, and conversely, how **errors in the lower sciences** can lead to errors about God.

First, through ignorance of the nature of creatures, **men are sometimes so perverted** as to set up as the First Cause and as God **some creature** that can only have its being from another.

Secondly, through ignorance or error they might attribute to certain creatures that which belongs **only to God**. This is the error of evolutionists who attribute to creatures the power to change their own natures -- a power that could come only from the Author and Creator of those natures. And **theistic evolutionists**, by having a wrong idea of creatures and their natures, suppose that God used evolution as His method of creating. They thereby **hold an erroneous idea** of God Himself **Who does not create anything by a process** because He is all Act and does not work by processes which are imperfect as such.

Thirdly, through ignorance of the creature's nature sometimes something is subtracted from God's power. This is evidenced in the case of those who set up two principles of reality; in those who assert that things proceed from God not by His divine free Will but by necessity. And again, there are those who withdraw either all or some things from the governance of Divine Providence, or who deny that God can work outside the ordinary course of things, as when He chooses to work miracles.

Fourthly, through ignorance of his own place in the universe, man, who by Faith is led to God as his last end, might be led to believe that he is subject to creatures to which he is in fact superior. Such is evidently the case with those who **subject human wills to the stars**, as in the false science of astrology.

It is therefore evident that the opinion is false of those who assert that it makes no difference to the truth of the Faith what we hold about creatures from the physical sciences, so long as one thinks rightly about God. For error about creatures, by subjecting them to causes other than God, [**as evolutionists do!**] spills over into **false ideas about God** and takes men's minds **away** from Him to whom Faith seeks to lead them.

For this reason, Scripture threatens punishment to those who err about creatures, as to unbelievers, in the words of the **Psalm 27:5**: "Because they have not understood the works of the Lord and the operations of His hands, Thou shalt destroy them, and shalt not build them up"; and: "These things they thought and were deceived," and further on: "They esteemed not the honor of holy souls." (**Wisdom 2:21-22**)

I have abbreviated these chapters somewhat and left out most of the Scripture quotations, which omissions I hope will stimulate the reader to consult St. Thomas himself and ponder his wise words.

Surely none but the most perverse could find in these words of St. Thomas any support for the autonomy of philosophy and the physical sciences from theology. On the contrary, St. Thomas shows -- and we could add many more examples -- that errors in the physical sciences lead to errors about God and the Faith. By this criterion alone -- that it leads away from God, from His Word in Holy Scripture, and from divine Catholic Faith -- both heliocentrism/a-centrism and evolution stand stunningly and crashingly condemned!

And as the focus of this paper attempts to show, the new descriptions of motion have had a devastating effect on Faith and have contributed to **naturalism, atheism, and materialism**. Even so, the new descriptions of motion took place in an era, the **17th** century, when the philosophy of nature had not yet become entirely separated from theology. **Descartes**, for example, had no trouble acknowledging God as first cause, and he was writing as a philosopher/scientist. One historian of science says this of Descartes' physics:

*All changes taking place in nature consist in motions of ... three kinds of particles. The primary cause of these motions resides in God's **concursum ordinarius**, the continuous act of conservation. He so directs the motion that the total **quantitas motus** (momentum), i.e., the sum of all the products of mass and velocity, remain constant. This relation, $\Sigma mv = \text{const.}$, "constitutes the supreme natural law..." This law, Descartes shows, springs from the invariability of God, in virtue of which, that He has wished the world to be in motion, the variation must be as invariable as possible.*

Since then, the historian Gerald Holton continues, we have learned to change the analytic content of the conservation law -- Furthermore:

We now do not say the conservation law springs from the "invariability of God"; but with that curious mixture of arrogance and humility which scientists have learned to put in place of theological terminology, we say instead that the law of conservation is the physical expression of the elements of constancy by which nature makes herself understood by us.²⁶

²⁶ Gerald Holton, *Thematic Origins of Scientific Thought: Kepler to Einstein*. Rev. ed. Cambridge: Harvard Univ. Press, 1988, p. 43.

The burden of all causality, whatever causality is recognized, is thereby removed from God and placed entirely on Nature, on secondary causes which are no longer recognized as secondary but are implicitly made to be primary, thus displacing God.

Another aspect of **Galileo's empiricism**, that which touches on his epistemology, may be brought in at this point. The same historian of science quoted above continues:

The strong hold that certain themes have on the mind of the scientist helps to explain his commitment to some point of view that may in fact run exactly counter to all accepted doctrine and to the clear evidence of the senses. Of this no one has spoken more eloquently and memorably than Galileo when he commented on the fact that to accept the idea of a moving earth one must overcome the strong impression that one can "see" that the sun is really moving:

*Nor can I sufficiently admire the eminence of those men's intelligence (Galileo's Salviati says in the Third Day of the **Dialogue Concerning the Two Principal Systems**,) who have received and held it (the Copernican system) to be true, and with the sprightliness of their judgments have done such violence to their own senses that they have been able to prefer that which their reason dictated to them to that which sensible experience represented most manifestly to the contrary.... I cannot find any bounds for my admiration how reason was able, in Aristarchus and Copernicus, to commit such rape upon their senses as, in spite of them, to make itself master of their belief.²⁷*

It would be impossible to imagine a more complete break with the Aristotelian-Thomistic epistemology than this almost Manichean contempt for the senses coupled with a Platonic exaltation -- yea, **separation -- of reason from reality**. Such are Galileo's heroes: those who defiantly **commit rape upon the senses**, that is, those who exult in the violation of the integrity of our knowledge and **despise the way God made us to understand the world in which we live** so as to be led by true knowledge, based upon our own sense knowledge, to the higher knowledge and love of Him, the Creator.

In Thomistic epistemology, there is a fruitful union between sense knowledge and the first act of the intellect **from which is born the concept**, a true representation of the real. Upon conceptual knowledge, reason builds its true judgments and comes to realize the real hierarchy of the universe created by God and destined to return to Him.

Galileo rejects the true metaphysics and epistemology, which he is bound to have known, in favor of a **Platonic idealism** which yet is not total, because it is attached to measurable reality. The world is, in Galileo, thus reduced to the quantitative aspects of reality -- a selective preference for one part of the totality. Aristotelian physics, against which he rebels, was, it is true, mainly qualitative. But Aristotle never tore out the quantitative from his world view. Error always produces a disastrous impoverishment, and Galileo is a good example of this fact.

In *The Assayer (II Saggiatore, 1623)* Galileo **reveals his Nominalism**, too -- logically congenial to **his particular brand of Platonism**. He dogmatizes that "tastes, odors, colors, and so

²⁷ Idem., pp.43-44.

on are no more than **mere names** so far as the object in which we place them is concerned, and that they reside only in the consciousness."²⁸

Of this same passage, which he gives in full, Charles Singer says that it

...contains a conception of great import for the subsequent development of science. This conception, moreover, was destined to colour deeply much of the philosophical thought of later ages. He [Galileo] here distinguishes sharply between those qualities of an object that are susceptible of exact estimation and those which can never be treated in this way.

.....

*This distinction between **primary qualities** and **secondary qualities**, as they came afterwards to be called, has been made by men of science ever since. Galileo was the prime mover in that development which is summed up in the phrase '**Science is measurement**'. "He maketh all things by number, weight, and measure."*

The Scripture is, of course, **Wisdom 11:21** of which Fr. Jaki, also, makes so much, as if it were absolutely the only **passage** in all of the Scriptures which we are allowed to take literally. I call that a very narrow, prejudiced fundamentalism. Charles Singer continues:

As to whether men of science have been right or wrong in their view that primary qualities have a reality lacking in secondary qualities, we need not for the moment consider. It is evident that ordinary experience is almost entirely made up of secondary qualities. The fact that men of science have dwelt chiefly on something else, something which ordinary men do not ordinarily consider, has separated them from their fellows. Since Galileo, men of science have formed a sort of priesthood which has been, not infrequently, opposed to another priesthood. Nor has the distinction which Galileo made remained entirely with men of science. Through Thomas Hobbes (1588-1679) and John Locke (1632-1704) in England, and through Marin Mersenne (1588-1648) and René Descartes (1596-1650) in France, it passed into general philosophy.²⁹

Singer's image is very apt, for now, in the late 20th century, this **scientific "priesthood"** has really displaced the Catholic priesthood in the power of its influence; for men believe the word of a scientist before they believe the words of the popes, and Holy Scripture itself, the Word of God, is **made to conform**, by whatever rending and tearing, **to the ideology of evolutionism**. Such is the apostasy of our time. And it **did not come upon us suddenly**. It began with the gradual acceptance of Copernicanism. This cosmology **weakened belief** in the authority of Holy Scripture **beyond repair**, for if the Bible is not to be believed when it reflects our most ordinary experience and the evidences of common sense, how can we trust it to teach us things **above the senses**? To deny the literal senses of Scripture where they are plainly intended to be taken as literal, and especially when we have the authority of the Fathers to support it -- **to deny these literal senses** of Scripture is to remove all responsibility from exegesis. For anyone can weave "spiritual" meanings from the texts of Scripture and no one can be required to follow the Rule of Faith if there is no literal sense. **The boat has been cut adrift, and the anchor is lost.**

²⁸ *Discoveries and Opinions of Galileo*, p. 274.

²⁹ Charles Singer. *A History of Scientific Ideas*, pp. 246-247.

So much for Galileo's devastating influence on philosophy. But **he was not alone**. Platonism was the preferred philosophy of the Renaissance as experimental method was the exalted empiricism of the physical sciences. That idealism and materialism should rise together is paradoxical but understandable because the scholastic synthesis was based on the hierarchy of being, and when that hierarchy crumbled, mind and body, spirit and matter, mathematics and extension fell out of their proper hierarchical relationships and **became dichotomized**.

The **separation of Faith from reason**, of science from religion was bound to follow the break-up of the medieval synthesis, because reason needs Faith to guide it and **science needs theology to supervise it** and correct it when it goes astray. That **Faith and modern science are in conflict** is no surprise, then, to those who realize the proper role of Faith and Theology. But when science is separated from Faith and from the true theology, it is **bound to fall into error**. And given the pride of modern man, he uses every method of deceit to defend his error and to foist it on others.

In these two areas, then, **Galileo was a pioneer leader**: 1) in the area of philosophy and 2) in the area of physics or mechanics, as it was then known -- the science of motion. **This paper has focused mainly on this latter aspect of Galileo's empiricism**. A. C. Crombie has placed the full burden of the new mechanics on Galileo:

*So far as the inertial principle was concerned, it was not Descartes but Galileo who provided the conception of motion on which Huygens, Newton and others were to build the classical mechanics of the 17th century."*³⁰

And for his science of motion, Galileo turned mainly to the pagan Archimedes (**287-212 B.C.**) who sought a fulcrum for a lever to move the world.

*Galileo found in the work of Archimedes and in the Platonic tradition generally, a lever to move his world. Archimedes geometrized space, bodies and motions, in notable contrast to the qualitative differentiations of places, natures and natural motions defended by Aristotle. Koyré has presented, I think, overwhelming evidence of Galileo's debt to Archimedes, the theoretician of mathematics, as well as to Plato, the philosopher of mathematical objectivity. Some of the writings of Archimedes were translated in the thirteenth century by the Dominican Archbishop of Corinth, William of Moerbeke; however, they attracted little attention at that time. The complete works of Archimedes were published almost half a century before the young Galileo wrote his *De motu*, and Galileo freely acknowledges his indebtedness to Archimedes, the "philosophus platonicus": "I would answer that I cover myself with the protecting wings of the superhuman Archimedes, whose name I never mention without a feeling of awe."*³¹

Not **Saint Thomas** who had been canonized in **1323** and declared a Doctor of the Church in **1567** nor any of the other holy men of his native Italy -- but this **pagan mathematician** who has now become the first canonized **saint of Science** -- canonized in 1592 by Galileo. St. Thomas never spoke of Aristotle in such exalted terms. But then, Galileo never learned anything from St. Thomas

³⁰ A. C. Crombie. *Augustine to Galileo*. 2 vols. in one. 2nd rev. and enl. ed. **1961**. Cambridge, Massachusetts: Harvard Univ. Press, p. 173 in Vol. 2.

³¹ James Weisheipl in *Galileo, Man of Science*, p. 96.

-- to his and our loss. **Galileo labored to take God out of Science.** But without God, **nothing** makes any sense.

An Addendum on Saint Augustine

As a kind of footnote or addendum to this paper, a few words on Saint Augustine are in order because of Galileo's use of texts from the great Doctor in his defense of Copernicanism.

First, let me say that I have read the twelve books of the *De Genesi ad Litteram* in the English translation of John Hammond Taylor, S.J.³² Two characteristics of this work impress me: 1) Saint Augustine's absolute belief in and fidelity to the doctrine of the inerrancy of Holy Scripture, and 2) his bringing to bear all the physical science of his day upon the teachings of the Sacred Books with the total submission of divine Faith and a willingness to learn from the words of Scripture what may be the facts of science.

The Rule of Faith was always his guide. In other words, he never allowed the science of his day to dictate the meaning of Scripture. Such a method would have horrified him. Rather, when he could not understand how the literal meaning could be, he simply left it and went on to the figurative meaning which did not, in any case, distort or abandon what was so clearly the literal meaning. And in the book of Genesis, the literal meaning is the same as the historical meaning. **The literal meaning tells what actually happened.**

These same two characteristics of belief in the inerrancy of Scripture and in the acceptance of the literal meaning of the historical books, are those which mark the creationists of today. But far from being encouraged and supported for following in the footsteps of the Fathers of the Church -- for they all did the same as Saint Augustine -- we **creationists are denigrated** and ostracized as fanatical fundamentalists.

Saint Augustine himself is quoted against us and made to speak in favor of an evolutionary science.

Galileo was the first to use Saint Augustine **in defense of error.** We need not bring St. Thomas into this argument because he is simply faithful to the teachings of St. Augustine on the interpretation of Holy Scripture.

Galileo set a precedent which has been disastrous for the defense of truth. Here is what Ernan McMullin says:

*The Augustinian thesis was clear-cut: the insights of Revelation so far surpass ordinary human knowledge that a literal interpretation of any given Biblical passage (assuming that there are no internal stylistic grounds to suspect that metaphor or allegory is being employed) carries more weight than any human "conjecture." Only if there is a **demonstrated** human truth which conflicts with the passage as literally interpreted are we entitled to question whether the passage ought to be interpreted literally or not. To put it briefly: **the lightest probability from Scripture outweighs any human conclusion, save one that is provable with certainty.***

That Galileo realized the burden he was laying on himself by conceding the Augustinian view seems perfectly clear. Phrases such as "truly demonstrated physical conclusions,"

³² St. Augustine. *The Literal Meaning of Genesis*. Transl. and annotated by John H. Taylor, S.J. 2 vols. New York: Newman Press, c.1982. ancient Christian Writers Series, No. 41.

*"demonstrated truths," "points which admit of direct demonstration or unquestionable reasoning," "manifest experience and necessary demonstrations," "rigorous demonstration," are **dotted throughout the Letter** [to the Grand Duchess Christina] wherever Galileo discusses the requisites a scientific thesis must satisfy before one can properly claim that a conflicting phrase in Scripture ought to be non-literally true.³³ (Emphases added)*

As McMullin admits and as any reading of Galileo's works makes abundantly clear, Galileo **abuses the Aristotelian terms of logic** and demonstration to an unconscionable degree. His is a clear case of the **distortion of truth** in the interests of rhetorical ends. The Sophists of ancient Greece excelled at it, though far more subtly than Galileo. Modern sophistry, as that of Galileo, **lacks the finesse** of the Greeks.

Galileo did not scruple, in the interests of his powerful rhetoric at the service of his **egotistical drive** to assert the correctness of Copernicus and himself **over the Aristotelians** and other geocentrists of his day, to use the terms of rigorous demonstration, provided by Aristotle himself, when he knew [and his more astute readers knew] that no such demonstrations were possible. However, as a good Nominalist, perhaps he was sincere in his belief that words are only words, **movements of the air**, and bear no intrinsic relation to our universal ideas of the real on the one hand and to things and real situations on the other. In this case, his bad epistemology served him well.

Galileo's sophistical use of the terminology of rigorous demonstration could form the subject of another paper entitled *Galileo's Mathematical Nominalism*. But I haven't the stomach for it.

There are several topics to be touched upon in this section on St. Augustine.

First, I'd like to make the point that even though the Fathers of the Church, both East and West, probably knew about speculations among a few of the Greek philosophers as to the earth's movement around the sun and on its own axis, **none of them took such speculations seriously** for a moment but rather accepted the evidence of the senses unquestionably as conforming to the truths of divine Revelation and considered any other view as **absurdly unworthy** even of mention. The world view/cosmology presented in Genesis I, was simply taken for **granted, and** it would never have occurred to the Fathers to question it. This is precisely the impression given whenever the sun in relation to the earth comes up in their discussions. Here are some typical passages from St. Augustine's work on the literal meaning of **Genesis**:

At the time when night is with us, the sun is illuminating with its presence those parts of the world through which it returns from the place of its setting to that of its rising. Hence it is that for the whole twenty-four hours of the sun's circuit there is always day in one place and night in another (Book I, chapter 10).

In these passages, St. Augustine is speaking of the work of the First Day of Creation, and in the following passage, he remembers that:

³³ Galileo, *Man of Science*, p. 33-34.

In the Book of Ecclesiastes it is written: The sun rises, and the sun goes down and is brought to his place; that is, to the place where it rose. And the author continues: At its rising it goes forth to the south and turns again to the north. When, therefore, the south has the sun, it is daytime for us; when the sun in its course has arrived in the north, it is night here. We cannot say that in the other region there is no daylight when the sun is there, unless our thinking is influenced by the fantasies of poets, so that we believe the sun dips into the sea and in the morning arises on the other side out of his bath. Even if this were so, the ocean itself would be illumined by the presence of the sun, and daylight would be there. It could certainly illuminate the waters, since it could not be extinguished by them. But such a supposition is preposterous. Moreover, the sun was not yet created. (Book I, chapter 10)

St. Augustine had a great deal of trouble with the light that was created on the first day of creation. I cannot help but believe that **he would have rejoiced** in the explanation of Henry Morris who holds that "the presence of visible light waves necessarily involves the entire electromagnetic spectrum... setting the electromagnetic forces into operation in effect completed the energizing of the physical cosmos"³⁴ I personally would phrase these physical events less to imply a process and more to indicate the Fiat creation of the electromagnetic spectrum with all that connotes. But it is the nature of **the first day's light** that is important here -- a light distinct from the sun which is a generator of light (from the Hebrew *ma-or*). Thus **intrinsic light** first and **light-givers** next.

An instance of St. Augustine's **refusal to disbelieve** Holy Scripture even when he does not understand the literal words occurs in Book II, ch. 5. He is discussing the waters above the firmament, something that gave all the Fathers much trouble and which, I believe, is a subject which could go far to being resolved for them by the explanations of Henry Morris. However, that is for³⁵ another time. It is in the course of this discussion that St. Augustine refers to the sun which, according to him, "completes a similar orbit in a year." The sun's orbit is similar, in this discussion, to that of the planet Saturn which "takes thirty years to complete" because "it is higher up and therefore travels a wider course." At the end of this chapter, St. Augustine concludes, for the edification of all modern exegetes:

But whatever the nature of that water and whatever the manner of its being there, we must not doubt that it does exist in that place. The authority of Scripture in this matter is greater than all human ingenuity.

Fundamentalism anyone? Make mine Catholic.

In many other passages St. Augustine speaks of the sun's movement around the earth, "as the sun revolves and night follows day," (Book 2, chapter 13), and "the sun rises from the east to the heights of heaven and then again makes its way to the west" (Book 2, chapter 14). It's quite obvious, I think, to any unprejudiced reader, that St. Augustine, and indeed, all the Fathers of the Church, accepted a geocentric universe as implied by the account of creation and confirmed by all the evidences of the senses.

³⁴ Henry M. Morris. *The Genesis Record*. San Diego: Creation Life, 1976, p. 65.

³⁵ Not all creationists accept the vapor theory as elaborated by Morris. However, it is the most widely accepted, and most creationists do accept "the waters above" as Scripture says.

One wonders, too, if the hectic pace of our times might not be blamed in large part on the now conventional misbelief that the earth, far from being still and stable, is whirling around the sun and spinning on its own axis in perpetuity. As Solange Hertz puts it, modern man now "eats, works and plays around the clock with no curb to his activity but exhaustion. He is driven to demonic frenzy by an illusion of accelerated time, whose most baleful effect is not so much shattered nerves and deadened wills as the near total destruction of prayer and recollection of God and divine truths."³⁶

Now we will look at those passages from St. Augustine that Galileo uses and quotes in his *Letter to the Grand Duchess Christina* of **1615**.

First, he criticizes those writers who use quotations from Scripture to support their various positions:

These men would perhaps not have fallen into such error had they but paid attention to a most useful doctrine of St. Augustine's, relative to our making positive statements about things which are obscure and hard to understand by means of reason alone. Speaking of a certain physical conclusion about the heavenly bodies, he wrote: "Now keeping always our respect for moderation in grave piety, we ought not to believe anything inadvisedly on a dubious point, lest in favor to our error we conceive a prejudice against something that truth hereafter may reveal to be not contrary in any way to the sacred books of either Old or the New Testament."³⁷

What Galileo is doing in this early part of the Letter is referring to his earlier works on the moons of Jupiter and the sunspots, both of which he observed through the telescope, and using these observations as a kind of support and confirming evidence for his Copernican thesis. And so he says:

Well, the passage of time has revealed to everyone the truths that I previously set forth; and, together with the truth of the facts, there has come to light the great difference in attitude between those who simply and dispassionately refused to admit the discoveries to be true; ...

And so on. He then links the disbelief about the truth of his discoveries with the telescope to his Copernican arguments, thereby implying, most falsely, that his telescopic observations and his Copernican convictions are to be placed on an equal footing as to proof. He constantly descends to arguments *ad hominem* to a near paranoid extent while all the time abusing and misusing such concepts as "refuting the arguments," "producing many counter-arguments ... which relate to physical effects whose causes can perhaps be assigned in no other way," "known truth," etc.:

Persisting in their original resolve to destroy me and everything mine by any means they can think of, these men are aware of my views in astronomy and philosophy. They know that as to the arrangement of the parts of the universe, I hold the sun to be situated motionless in

³⁶ Solange Hertz, *Beyond Politics*. Veritas Press, **1995**, p.73.

³⁷ *Discoveries and Opinions of Galileo*, pp. 175-177.

*the center of the revolution of the celestial orbs while the earth rotates on its axis and revolves about the sun. They know also that I support this position not only by refuting the arguments of Ptolemy and Aristotle, but by producing many counter-arguments; in particular, some which relate to physical effects whose causes can perhaps be assigned in no other way....*³⁸

And so on, drawing on his telescopic discoveries, he uses them against the Ptolemaic and Aristotelian systems in a manner calculated to convince the uninformed and the prejudiced but hardly in a manner conforming to the canons of demonstration then in force and widely known.

In the passage quoted, St. Augustine is speaking of the question "Are the heavenly bodies ruled by spirits?" (Book 2, chapter 18). Here is what he says:

It is often asked whether the bright luminaries of heaven are bodies only or whether they have spirits within them to rule them; and whether, if they have such spirits, they are made living beings by their souls, or whether there is only the presence of spirits without a vital union. This problem is not easy to solve, but I believe that in the course of commenting on the text of Scripture occasions may present themselves on which we may treat the matter according to the rules for interpreting Holy Scripture, presenting some conclusion that may be held, without perhaps demonstrating it as certain. Meanwhile we should always observe that restraint that is proper to a devout and serious person and on an obscure question entertain no rash belief. Otherwise, if the evidence later reveals the explanation, we are likely to despise it because of our attachment to our error, even though this explanation may not be in any way opposed to the sacred writings of the Old or New Testament.

Galileo is speaking of **a new doctrine that is opposed** to all that has been believed about the teaching of Scripture and, by bringing in this quotation from St. Augustine thereby makes the Copernican error **appear** to be on a par with something as debatable as the nature of the celestial bodies. A new "arrangement of the universe" **clearly at odds** with the traditional teaching is hardly of the same kind of question as that which St. Augustine is discussing here. However, and in any case, what St. Augustine says should be applied directly to the Copernican view:

- 1) is the Copernican view one that presents a "conclusion that may be held, without perhaps demonstrating it as certain"? The answer is yes, according to St. Robert Bellarmine who told Galileo that he could hold it **as an hypothesis**;
- 2) did Galileo always "observe the restraint that is proper to a devout and serious person"? All his biographers agree that he was **arrogantly** ambitious and aggressive in his Copernican belief.
- 3) did Galileo entertain "no rash belief" on this question of Copernicanism?
Heliocentrism could hardly be classified, I think, as an obscure question if we mean by that one difficult to understand on the face of it. It was directly opposed to the geocentric position referred to by Scripture and in that sense it was not obscure. It was obscure only in demanding for its acceptance the complete overturn and repudiation of all that common sense tells us and that Scripture plainly states. It was obscure in its

³⁸ Idem.

irrationality in a way that belief in the Angelic ruling of the heavenly bodies was -- and is -- not.

- 4) Galileo certainly showed a great attachment to his error in any case, and the explanations of the heliocentric theory have always required the believer to abandon his belief in the inerrancy of Holy Scripture and to deny the evidence of his senses.

The next quotation from St. Augustine is lengthy, but I will give it in full. Galileo is using it in support of his Copernican view by simply dissociating anything Scripture might say or imply from this new cosmology. St. Augustine says in Galileo's text:

It is likewise commonly asked what we may believe about the form and shape of the heavens according to the Scriptures, for many contend much about these matters. But with superior prudence our authors have forborne to speak of this, as in no way furthering the student with respect to a blessed life -- and, more important still, as taking up much of that time which should be spent in holy exercises. What is it to me whether heaven, like a sphere, surrounds the earth on all sides as a mass balanced in the center of the universe, or whether like a dish it merely covers and overcasts the earth? Belief in Scripture is urged rather for the reason we have often mentioned; that is, in order that no one, through ignorance of divine passages, finding anything in our Bibles or hearing anything cited from them of such a nature as may seem to oppose manifest conclusions, should be induced to suspect their truth when they teach, relate, and deliver more profitable matters. Hence, let it be said briefly, touching the form of heaven, that our authors knew the truth but the Holy Spirit did not desire that men should learn things that are useful to no one for salvation.

Galileo here interjects with what might be perceived as some impatience with the sacred authors and then continues to quote from St. Augustine:

The same disregard of these sacred authors toward beliefs about the phenomena of the celestial bodies is repeated to us by St. Augustine in his next chapter. On the question whether we are to believe that the heaven moves or stands still, he writes thus:

Some of the brethren raise a question concerning the motion of heaven, whether it is fixed or moved. If it is moved, they say, how is it a firmament? If it stands still, how do these stars which are held fixed in it go round from east to west, the more northerly performing shorter circuits near the pole, so that heaven (if there is another pole unknown to us) may seem to revolve upon some axis or (if there is no other pole) may be thought to move as a discus? To these men I reply that it would require many subtle and profound reasonings to find out which of these things is actually so; but to understand this and discuss it is consistent neither with my leisure nor with the duty of those whom I desire to instruct in essential matters more directly conducing to their salvation and to the benefits of the holy Church.³⁹

One wonders how it was that Galileo felt himself so righteous in holding forth with absolute certitude for the Copernican theory in the face of this diffidence and detachment towards the

³⁹ Ibid., pp.184-185.

physical sciences and preference for the more important doctrinal matters. But Galileo gives us his conclusions, some key phrases and sentences of which I embolden for emphasis:

*From these things it follows **as a necessary consequence** that, since the Holy Ghost did not intend to teach us whether heaven moves or stands still, whether its shape is spherical or like a discus or extended in a plane, nor whether the earth is located at its center or off to one side, **then so much the less was it intended to settle for us any other conclusion of the same kind**. And the motion or rest of the earth and the sun is so closely linked with the things just named, that without a determination of the one, **neither side can be taken in the other matters**. Now if the Holy Spirit has purposely neglected to teach us propositions of this sort **as irrelevant** to the highest goal (that is, to our salvation), how can anyone affirm that it is obligatory to take sides on them, and that one belief is required by faith, while the other side is erroneous? Can an opinion be heretical and yet have no concern with the salvation of souls? Can the Holy Spirit be asserted not to have intended teaching us something that does concern our salvation? I would say here something that was heard from an ecclesiastic of the most eminent degree: "That the intention of the Holy Ghost is to teach us how one goes to heaven, not how heaven goes."*

Galileo is really telling his opponents that St. Augustine **leaves the physical sciences out of Scripture**, that he separates Faith from the sciences. And **this is what Galileo would like**. But his opponents claim that the Copernican cosmology is heretical, and **things heretical do touch the Faith**.

Galileo, moreover, **dichotomizes** where St. Augustine **hierarchizes**. It is not a matter of Faith versus the physical sciences but of **Faith as superior to the physical sciences**. Agreeing, it appears, that the physical sciences, especially of cosmology, are "irrelevant to the highest goal" -- - but Galileo has **put words in the mouth** of the holy doctor. St. Augustine does **not** say, never says that the physical sciences are "irrelevant." He says that there should never be allowed to appear "manifest conclusions" in the physical sciences that would seem to oppose the teachings of Scripture lest the Scriptures be mistrusted when they teach of higher matters. In the second instance, St. Augustine says that he has not the time -- the "leisure" -- to pursue these "subtle and profound reasonings" in the physical sciences when his higher duty is to instruct his brethren in the more important matters of salvation.

However, the passage quoted from St. Augustine does not end where Galileo ends his quote. St. Augustine proceeds:

They must certainly bear in mind that the term "firmament" does not compel us to imagine a stationary heaven: we may understand this name as given to indicate not that it is motionless but that it is solid and that it constitutes an impassable boundary between the waters above and the waters below. Furthermore, if the evidence shows that the heavens actually are immovable, the motion of the stars will not be a hindrance to our acceptance of this fact. The very scholars who have devoted the most exhaustive study to this subject have concluded that if the stars alone were moved while the heavens were motionless, all the known phenomena observed in the motions of the stars might have taken place (Book 2, chapter 10).

And so, it is plain that St. Augustine does not consider the explanations of the physical sciences to be "irrelevant." He only insists that they conform to the plain meaning of the Scriptures.

But Galileo is not at all interested in absorbing the spirit or the letter of St. Augustine's teaching. He is looking for some authoritative support for his own desire to disassociate faith and science, to render Scripture irrelevant to the physical sciences.

St. Augustine's approach to Holy Scripture was 1) a most firm faith that the sacred authors could not err, and 2) that if he, Augustine, did not understand the sacred text, the fault lay not with Scripture but with his own dullness of mind. In chapter 21 of Book 4, he makes several admissions of this kind: "it is easier to admit our ignorance of a thing that is beyond our experience, and confess our inability to explain how the light that is called Day brought about the passage of day and night ... "; or "It is easier to confess our ignorance of these matters than to go against the obvious meaning of the words of Holy Scripture ... "; and "But since there can be no error in Scripture, we must conclude that the presence of the light that God made as day was repeated throughout all the works as often as day is mentioned,..."

It is obvious that Galileo is light years away from such faith and humility before the words of Holy Scripture. Galileo's **manifest purpose** was either to convince both his friends and his opponents **that Scripture is irrelevant** by dissociating its intended meaning from anything to do with the physical sciences, or else to make the Scriptures say what he wants them to say, as he attempted to do in his exposition of Joshua's Long Day. He would have us believe, too, that he has at hand all those "necessary demonstrations" and "manifest conclusions" that St. Augustine says must be brought forth in order to offer any serious challenge to the sacred text. Galileo claimed such "necessary demonstrations" for the Copernican cosmology. What success he enjoyed in bringing off this **colossal hoax** was due to the great esteem the men of his day had for logical demonstrations on the one hand and to Galileo's powerful sophistical rhetoric on the other.

One can see this in the last passage quoted wherein he **maneuvers his opponents** into the unenviable position of seeming to be at odds with the great St. Augustine. For, first he tries to make us believe that St. Augustine considers the physical sciences irrelevant in the interpretation of Scripture, and then he puts us and his enemies into the position of claiming a cosmological opinion to be heretical, since it contradicts Scripture, whereas he has just shown, apparently, that according to St. Augustine all such opinions and conclusions of the physical sciences are irrelevant, because it's not how the heavens go that is important, but how to go to heaven. **This is sophistry** of the first water, but the men of the Renaissance were skilled in it and gloried in such exercises of the rhetorical art. Galileo put it at the service of **his false science** which dishonored the Scriptures and set mankind on a course of rebellion against the authority of God revealing through His Church.

Galileo next quotes from a learned commentator, one Pererius, prefacing this authority's opinion with his own habitual misuse of logical and metaphysical concepts:

But let us again consider the degree to which necessary demonstrations and sense experiences ought to be respected in physical conclusions and the authority they have enjoyed at the hands of holy and learned theologians. From among a hundred attestations I have selected the following:

"We must also take heed, in handling the doctrine of Moses, that we altogether avoid saying positively and confidently anything which contradicts manifest experiences and the reasoning of philosophy or the other sciences. For since every truth is in agreement

with all other truth, the truth of Holy Writ cannot be contrary to the solid reasons and experiences of human knowledge."

And in St. Augustine we read: "If anyone shall set the authority of Holy Writ against clear and manifest reason, he who does this knows not what he has undertaken; for he opposes to the truth not the meaning of the Bible, which is beyond his comprehension, but rather his own interpretation; not what is in the Bible, but what he has found in himself and imagines to be there." ⁴⁰

The reason that Galileo could read such passages as these and apply them to his own views with such confidence of being correct is because his world view had become radically different from that of his opponents -- and also, above all, from those whom he quotes. For they are thinking of sound philosophical doctrines that in no way conflict with Scripture, such as the cosmologies of Aristotle and Ptolemy; or they would think of such doctrines as the eternity of the world which they never hesitated to condemn on the very basis of Scripture, which we have seen St. Thomas do. Furthermore, the authors whom Galileo quotes **all held the supremacy of Scripture** as an authority, and none of them had any trouble accepting the **literal meaning of Genesis** and all those **passages in Scripture which refer to the movement of the sun.**

Galileo's entire mind-set has shifted. He is convinced that the Copernican cosmology is the correct one, and therefore he is bound, to his way of thinking, which is the way of the modernist, that Scripture must somehow and anyhow be made to accommodate this new cosmology. Thus, he will apply to his opponents such ideas as "his own interpretation" and "and what he imagines in himself." The "manifest experiences and the reasoning of philosophy or the other sciences" do not, in his mind, refer to the traditional doctrines of scholastic philosophy and theology, but to the "manifest experiences" of his own experiments and his interpretations of the sun spots and the moons of Jupiter.

Modernists of today do the same thing, and show themselves to be true sons of Galileo. They tell us that the sacred authors of the Scriptures did not know about the findings of modern science, that they were speaking to ignorant, primitive peoples, and that therefore they need not be believed when they speak of such things as the light that was created on the first day of creation or of the stillness, stability and immovability of the earth.

And so, what Galileo says could just as well be said by any present-day nominal Catholic who believes the teachings of modern science rather than the traditional interpretation of the Scriptures:

... it being true that two truths cannot contradict one another, it is the function of wise expositors to seek out the true senses of scriptural texts.

If one consults such "wise expositors" as Cardinal Ratzinger and Fr. Anthony Zimmerman, one finds, in both cases, that the literal sense of Genesis must be sacrificed entirely in favor of an entirely spiritual sense in the first case, and in the second, in favor of an entirely new mythology; and in both cases, it is the myth of evolution that is substituted for the truth of Scripture.

⁴⁰ Idem., p. 186. Drake's note advises Pererius on Genesis, near the beginning, and from St. Augustine, in the seventh letter to Marcellinus.

In Galileo's case, where only the Copernican cosmology was at issue, he insists upon the **scientific** truth, proven and demonstrated, of the heliocentric theory. It is therefore up to the theologians to **re-interpret the Scriptures**, and their best bet, according to Galileo as well as his modern descendants, is to admit that the Scriptures are obscure, metaphorical, that commentators are not divinely inspired, and that not even the Scriptures can stand firm in the face of scientific findings. So he goes on:

These [true senses of scriptural texts] will unquestionably accord with the physical conclusions which manifest sense and necessary demonstrations have previously made certain to us.

Notice that the true senses of scripture conform to the findings of the physical sciences, not the other way around. This is quintessential modernism. He continues:

Now the Bible, as has been remarked, admits in many places expositions that are remote from the signification of the words for reasons we have already given. Moreover, we are unable to affirm that all interpreters of the Bible speak by divine inspiration, for if that were so there would exist no differences between them about the sense of a given passage. Hence I should think it would be the part of prudence not to permit anyone to usurp scriptural texts and force them in some way to maintain any physical conclusion to be true, when at some future time the sense and demonstrative or necessary reasons may show the contrary.

It is clear that Galileo would never think of applying that "prudence" which he advocates for the theologians of his time **to himself** and his own position on cosmology. He is thinking of the Aristotelians, the geocentrists, and accusing them of allowing a geocentrist interpretation "to usurp scriptural texts and force them in some way to maintain" the physical theory of geocentrism to be the true one and in accord with Scripture. He **hoodwinks his reader** into believing that it is the traditional view that is wrong and blameworthy -- whereas it is the new Copernican theory that is **the usurper**. But it is all *deja vu* for us today! And we live with it in this apostasy of the nations and of the Catholic theologians.

Galileo completely misunderstood the nature and function of theology as judge of error over all the other sciences. He disputes at some length about the entitlement of sacred theology to be the queen of the sciences, but he finally concedes:

Let us grant then that theology is conversant with the loftiest divine contemplation, and occupies the regal throne among sciences by dignity. But acquiring the highest authority in this way, if she does not descend to the lower and humbler speculations of the subordinate sciences, and has no regard for them because they are not concerned with blessedness, then her professors should not arrogate to themselves the authority to decide on controversies in professions which they have neither studied nor practiced....

Let St. Thomas answer him:

The knowledge proper to this science of theology comes through divine revelation and not through natural reason.

Therefore, it has no concern to prove the principles of other sciences, but only to judge them.

Whatever is found in other sciences contrary to any truth of this science of theology, must be condemned as false ... (ST, I, Q 1, a 6, ad 2)

This is precisely what the theologians of Galileo's time were doing: they judged the Copernican cosmology as contrary to divine revelation, and so **condemned it as false**. The precise target of Galileo's condemnation was not himself but **the errors he upheld**. These were pin-pointed in the two propositions that represented Galileo's doctrine:

- 1) The sun is the center of the world and completely immovable, by local motion.
- 2) The earth is not the center of the world, nor immovable, but moves according to the whole of itself, and also with a diurnal motion.

The first proposition was declared unanimously to be foolish and absurd in philosophy and **formally heretical** inasmuch as it expressly contradicts the doctrine of Holy Scripture in many passages, both in their literal meaning and according to the general interpretation of the Fathers and Doctors.

The second proposition was found to merit the same censure in philosophy, and from a theological standpoint, to be at least erroneous in faith.⁴¹

These condemnations are specifically the function of theology and there is no trespass whatsoever upon limits of science in which theologians might be expected to have no competency. The cosmological assertions are found to conflict with the teaching of God in divine revelation. They must be condemned, and they were. The theologians did their job, and it was a job that only they could do. Galileo was completely out of order in demanding that theologians be proficient in any of the physical sciences.

Even while protesting that truth is all one and that truth in the physical sciences cannot contradict with the truths of faith, Galileo **still implies** that this could be so. He accuses the theologians of commanding that the scientists...

...must not see what they see and must not understand what they know, and that in searching they must find the opposite of what they actually encounter. Before this could be done they would have to be taught how to make one mental faculty command another, and the inferior powers the superior, so that the imagination and the will might be forced to believe the opposite of what the intellect understands. I am referring at all times to merely physical propositions and not to supernatural things which are matters of faith.⁴²

But faith is in the intellect, and if faith teaches one thing as based in divine revelation, such as the geocentric cosmology, and if the scientist thinks that as a result of his observations and discoveries with telescopes and such like, his senses, i.e., his imagination, report something in opposition to faith, then his intellect tells him that his senses, or more likely, his interpretation of sense data, are misleading him. His will enters only in his faith being a **good** faith, i.e., **submissive** to divine revelation.

⁴¹ Jerome J. Langford, O.P. *Galileo, Science and the Church*. New York: Desclee, 1966, p. 89.

⁴² *Discoveries and opinions of Galileo*, p. 193.

But Galileo **polarizes the scientist** and his work to the supernatural truths of faith. His "merely physical propositions" if they are truly merely physical observations or observations of physical processes, can in no way contradict any teaching of faith. It is **only the interpretation** that the scientist puts upon his data that can become contradictory.

But Galileo confuses the matter inexcusably by his misuse of logical terminology, as when he entreats the theologians to "consider with great care the difference that exists between doctrines subject to proof and those subject to opinion." The truths of faith possess the highest proof and the highest certitude there is, that of the authority of God revealing, which guarantees absolute certitude.

He is **trying to entangle** the theologians **in matters of opinion**, but thank God, he did not succeed. That triumph of modernism was **reserved for our day**. By his sophistic rhetoric, Galileo attempts to persuade his readers that the Copernican cosmology has "demonstrative science" to support it. It is in this context that he draws again on St. Augustine:

It is to be held as an unquestionable truth that whatever the sages of this world have demonstrated concerning physical matters is in no way contrary to our Bibles; hence whatever the sages teach in their books that is contrary to the holy Scriptures may be concluded without any hesitation to be quite false. And according to our ability let us make this evident, and let us keep the faith of our Lord in whom are hidden all the treasures of wisdom, so that we neither become seduced by the verbiage of false philosophy nor frightened by the superstition of counterfeit religion.

Now one would think **surely** Galileo would take this as applying, so very clearly, to the revived pagan cosmology of Copernicus which, because it was contrary to the holy Scripture should "be concluded without any hesitation to be quite false." But no. Galileo **has an agenda**, and that agenda is to force St. Augustine to support his view. This he tries to do by claiming that the Copernican theory is a "truly demonstrated physical" conclusion.

One cannot help but marvel at the fact that while Galileo did not succeed in this deceitful task, **his successors have done so**. The very **prestige** built up by this **success of the lie** of heliocentrism gave credibility to **the next great lying deception of evolution**. And the key to the success of both these errors lies, in my opinion, in the fact that Galileo put God in the dock, to borrow a phrase from C.S. Lewis. With faith in the authority of God revealing weakened, little by little souls could be corrupted into believing the grossest tall tale of them all, that of evolution.

The passage from St. Augustine just quoted by Galileo continues with words we need today even more than they were needed when first written:

When we read the inspired books in the light of this wide variety of true doctrines which are drawn from a few words and founded on the firm basis of Catholic belief, let us choose that one which appears as certainly the meaning intended by the author. But if this is not clear, then at least we should choose an interpretation in keeping with the context of Scripture and in harmony with our faith. But if the meaning cannot be studied and judged by the context of Scripture, at least we should choose only that which our faith demands. For it is one thing to fail to recognize the primary meaning of the writer, and another to depart from the norms of religious belief. If both these difficulties are avoided, the reader gets full profit from his reading. Failing that, even though the writer's intention is uncertain, one will find it useful to extract an interpretation in harmony with our faith (Book 1, chapter 21).

Galileo failed, among other things, to follow the rule of faith which is what St. Augustine advocates here above all else. But then, Galileo, modernist that he was, did not really care to learn from this great and holy Doctor how the Scriptures are to be revered and interpreted with submission to faith above all. The last time Galileo drags in St. Augustine to support his crooked agenda, he is still insisting that no one should use Scriptural passages to decide physical conclusions. He says:

The most holy Fathers ... knew how prejudicial (and how contrary to the primary intention of the Catholic Church) it would be to use scriptural passages for deciding physical conclusions, when either experiments or logical proofs might in time show the contrary of what the literal sense of the words signifies. Hence they not only proceeded with great circumspection, but they left the following precepts for the guidance of others: "In points that are obscure, or far from clear, if we should read anything in the Bible that may allow of several constructions consistently with the faith to be taught, let us not commit ourselves to any one of these with such precipitous obstinacy that when, perhaps, the truth is more diligently searched into, this may fall to the ground, and we with it. Then we would indeed be seen to have contended not for the sense of divine Scripture, but for our own ideas by wanting something of ours to be the sense of Scripture when we should rather want the meaning of Scripture to be ours." And later it is added, to teach us that no proposition can be contrary to the faith unless it has first been proven to be false: "A thing is not forever contrary to the faith until disproved by most certain truth. When that happens, it was not holy Scripture that ever affirmed it, but human ignorance that imagined it."

Galileo consistently casts the geocentric world view of Scripture into the category of "points that are obscure, or far from clear" whereas **the truth of the matter** is that the immovability and stability of the earth was never doubted by the Fathers. It was the precise movement and arrangement of the heavens that **was mysterious -- and still is**. (See especially chapters 9 and 10 of Book 2 of the *De Genesi ad Litteram* of St. Augustine, parts of which are quoted above).

Galileo continues with his insistence upon "demonstrated truths" which he tries to claim for the Copernican theory, not by actual demonstration but merely by a powerful rhetorical suggestiveness:

From this it is seen that the interpretation which we impose upon passages of Scripture would be false whenever it disagreed with demonstrated truths. And therefore we should seek the incontrovertible sense of the Bible with the assistance of demonstrated truth, and not in any way try to force the hand of Nature or deny the experiences and rigorous proofs in accordance with the mere sound of words that may appeal to our frailty. Let Your Highness [Grand Duchess Christina] note further how circumspectly this saint proceeds before affirming any interpretation of Scripture to be certain and secure from all disturbing difficulties. Not content that some given sense of the Bible agrees with some demonstration, he adds: "But when some truth is demonstrated to be certain by reason, it is still not certain whether in these words of holy Scripture the writer intended this idea, or some other that is no less true. And if the context of his words prove that he did not intend this truth, the one that he did intend will not thereby be false, but most true, and still more profitable for us to know."

By repeatedly quoting these passages from St. Augustine which caution to prudence and insist upon rigorous proof, Galileo is able to align himself, in the reader's mind, with those cautious reverent and dispassionate exegetes and to dissociate himself from all thought of the rash and self-serving. He is a most clever rhetorician. But he did not fool the theologians of his day. He tried hard, though, as he continues:

Our admiration of the circumspection of this pious author only grows when he adds the following words, being not completely convinced after seeing that logical proof, the literal words of the Bible, and all the context before and after them harmonize in the same thing: "But if the context supplies nothing to disprove this to be the author's sense, it yet remains for us to inquire whether he may not intend the other as well." Nor even yet does he resolve to accept this one interpretation and reject the other, appearing never to be able to employ sufficient caution, for he continues: "But if we find that the other also may be meant, it may be inquired which of them the writer would want to have stand, or which one he probably meant to aim at, when the true circumstances on both sides are weighted."

By this time one should be wondering just what it is that St. Augustine is talking about in his own book, and we should not be at all surprised, given the character of Galileo, that the subject of St. Augustine's discourse in these passages quoted by Galileo, is "The Spirit stirring or brooding over the waters." Even so, let's go along with Galileo's little out-of-context deception:

And finally he supplies a reason for this rule of his, by showing us the perils to which those men expose the Bible and the Church, who, with regard for the support of their own errors than for the dignity of the Bible, attempt to stretch its authority beyond the bounds which it prescribes to itself.

Now this last sentiment is specifically and peculiarly that of Galileo. There is nothing like it in St. Augustine who revered the "divine Scriptures" as above all human natural reason, not some human discourse or discipline with prescribed limits. God speaks on whatever subject He wishes and it is not for us or any arrogant scientist to prescribe the limits of His discourse. But we will hear Galileo out to the bitter end:

The following words which he adds should alone be sufficient to repress or moderate the excessive license which some men arrogate to themselves: "It often falls out that a Christian may not fully understand some point about the earth, the sky, or the other elements of this world -the motion, rotation, magnitude, and distance of the stars; the known vagaries of the sun and moon; the circuits of the years and epochs; the nature of animals, fruits, stones, and other things of that sort, and hence may not expound it rightly or make it clear by experiences. Now it is too absurd, yea, most pernicious and to be avoided at all costs, for an infidel to find a Christian so stupid as to argue these matters as if they were Christian doctrine; he will scarce be able to contain his laughter at seeing error written in the skies, as the proverb says. The worst of the matter is not that a person in error should be laughed at, but that our authors should be thought by outsiders to hold the same opinions, and should be censured and rejected as ignorant, to the great prejudice of those whose salvation we are seeking. For when infidels refute any Christian on a matter which they themselves thoroughly understand, they thereby evince their slight esteem for our Bible. And why

should the Bible be believed concerning the resurrection of the dead, and hope of eternal life, and the kingdom of Heaven, when it is considered to be erroneously written as to points which admit of direct demonstration or unquestionable reasoning?"

Never must the reader be allowed to think that Galileo would be among those who disregard the admonitions of this holy and pious Doctor or that he, Galileo, could conceivably be found among the rash and presumptuous. It is in this vein that the *Letter to the Grand Duchess* continues and finally concludes -- but I will spare the reader all but the final quotation of St. Augustine:

There are men who, in defense of propositions which they do not understand, apply -- and in a way commit -some text of the Bible, and then proceed to magnify their original error by adducing other passages that are even less understood than the first. The extent to which truly wise and prudent Fathers are offended by such men is declared by the same saint in the following terms: "inexpressible trouble and sorrow are brought by rash and presumptuous men upon their more prudent brethren"

The "truly wise and prudent Fathers" are those theologians of Galileo's day who supported him in the Copernican error, while those who defend propositions they do not understand and thereby commit "rash and presumptuous" acts against the Scriptures are those theologians who upheld the geocentric interpretation of all the Church Fathers and Tradition. But let him go on:

When those who respect the authority of our Bible commence to reprove and refute their false and unfounded opinions, such men defend what they have put forth quite falsely and rashly by citing the Bible in their own support, repeating from memory biblical passages which they arbitrarily force to their purposes, without knowing either what they mean or in what they properly apply."

It seems to me that we may number among such men those who, being either unable or unwilling to comprehend the experiences and proofs used in support of the new doctrine by its author and his followers, nevertheless expect to bring the Scriptures to bear on it⁴³

As pointed out earlier, the theologian is not required nor expected to be proficient in the lower sciences, for he speaks from the **highest pinnacle** of knowledge and science which is **divine revelation**. From there he can see what he needs to see, and that is when and where the lower sciences stray from the truths of faith. His expertise is precisely in that sphere which Galileo attempts to snatch from him -- the exegesis of the Scriptures. The theologians held on to that prerogative of theirs in Galileo's day. **Would that they still so held.**

These final quotations from St. Augustine are taken from chapter 19 in Book 1 of the *De Genesi* and here, indeed, St. Augustine is speaking of "Interpreting the mind of the sacred writer" and that "Christians should not talk nonsense to unbelievers." The rule of faith is the supreme law in Scriptural exegesis. An interesting example in this regard is that of the antipodes, a problem closely linked with the sphericity of the earth. The Fathers of the Church were unanimous in their rejection of the idea that men existed in a part of the earth that could not be reached by the preachers of the Gospel. Put this way, we can see the Rule of Faith that guided the Fathers; their view was based on

⁴³ Idem., pp. 206-209.

Psalm 18:5 and **Romans 10:18**. But the disbelief of the theologians in the antipodes, and this disbelief lasted well into the 16th century, brought great ridicule upon the Church by men like A. D. White whose account of this geographical curiosity is suffused with **an unholy glee**.⁴⁴

Is the case of geocentrism a similar one? Galileo and the modernists of our time would have us think so. But it is not likely. The sphericity of the earth along with its being hung upon nothing (**Job 26:7**) are proven beyond any shadow of doubt both by travel and by photographs. The Fathers did not base their faith on a flat earth but **on the teaching of Scripture** that there can be no place on earth where the Gospel cannot be preached.

The case of geocentrism is different because we have two condemned propositions absolutely clear in their meaning, which proclaim the positive assertions that the earth does not move, either diurnally or annually, and the sun does move around the earth. No demonstrations or proofs have ever been brought forth to disprove the geocentric doctrine. On the contrary, the most recent admissions make the point, by their failure to disprove the biblical cosmology, that geocentricity is, in fact, a divinely revealed knowledge of the arrangement of the cosmos. It is like the doctrine of creation ex nihilo and in time -- a divinely revealed fact which can be neither proven nor disproven by human means. Walter van der Kamp [1913-1998] quotes Bertrand Russell [1872-1970]: "Whether the earth rotates once a day from West to East, as Copernicus taught, or the heavens revolve once a day from East to West, as his predecessors believed, the observable phenomena will be exactly the same."⁴⁵ For other similar admissions, see the early part of my paper, "Galileo's Heresy."

And so, the proofs and demonstrations predicted by Galileo in favor of the Copernican theory have never materialized, even though this Age of Lies in which we live would teach children and adults alike differently.

Galileo never gave up his rash and presumptuous view that heliocentrism was fully consonant with the teachings of Scripture. He should be living today. Perhaps he is. John Paul II has revived him -- in all his infamous glory.

What Galileo accomplished in all of his twisted arguments was confusion. But it was a confusion that worked to achieve his own goals. He **succeeded in intimidating** his contemporaries, he succeeded in instilling in them a fear that Copernicus must be right or at least, proven right in the future -- by more "experiments" and "proofs" and "necessary demonstrations" of logic and experience. That **same intimidation works today** among the weak in faith. A **monstrously arrogant** science has usurped the very throne of Truth. It is a triumph, beyond imagination, of the **Father of Lies**.

I have termed Galileo **the first modernist** because he was the **first Catholic of note** to publicly disregard the interpretation of Holy Scripture upheld by the Church, in the name and interest of a "science" that claimed to know more and to have a superior knowledge than that of divine revelation. This is the essential **definition of modernism** given at length by St. Pius X in his encyclical *Pascendi*. Modernists, he said, first seek to **separate faith from science** and then to

⁴⁴ A. D. White. *A History of the Warfare of Science with Theology in Christendom*. 2 vols. New York: Dover Publications, 1960, pp. 102-110 in Vol. I. Originally published by MacMillan in 1896.

⁴⁵ Walter van der Kamp [1913-1998]. "Einstein -- Right or Wrong?" Privately printed [Canada]. ca 1992. Posted copy may be possible from P. Ellwanger; refer to Note 20.

subjugate that same faith to a godless science. That this was also precisely Galileo's agenda is plain to anyone who reads his works with his eyes of faith wide open.

To conclude this section of the present paper, let me quote from the work of a fellow Catholic who puts so well what we have lost by the error of heliocentrism. James Forsee in his *The Heliocentric Hoax* writes:

*The twentieth-century man may think it is of no importance whatever, whether the sun or the earth was proved to be the center of the universe -- but it was then and it is now. History has verified this. To understand it, one must seek to study history on its own terms, and in the context of that era. Before the Galileo heresy the Christian, as opposed to the progressive modern man, was not only geocentric, but Theocentric (God-centered): Before the "earth-movers" arrived on the scene, Western Civilization had an orderly world-view; everything had its place. First of all, man believed in God, the Creator of Heaven and earth, and in His Holy Mother the Church. He also believed that God sent His only-begotten Son, Jesus Christ, to the center of the universe, the motionless earth, in order to redeem man. And, contrary to this worldly twentieth-century counterpart, man yearned for Heaven where God reigned. The only means of enjoying His Beatific Vision was through Christ's Church. All bespoke unity. Man knew the importance of the Church and the necessity of belonging to Her. He may have belonged to a certain manor, a certain town, a certain guild, and so on, but the Chain of command was virtually unbroken. If he were a vassal, he would be answerable to his lord,, and in turn, the lord would answerable to the king, the king answerable to the Pope (primarily in moral matters) -- and all of these answerable to God. In short, man knew where he stood. All was orderly, all was secure; man **believed** and he **belonged**.*

Then, with the new world view, came doubt, the enemy of faith. (As the famous English poet, John Donne, so aptly bemoaned, "And new philosophy calls all in doubt.") Man, now displaced from the center of the universe, not only sustained a loss of dignity, purpose, direction -- but also, he was, most tragically, psychologically divorced from God the all-unifying Creator. This is why this controversy is crucial.⁴⁶

Modern man in his **inexcusable folly** searches the outermost reaches of space for some sign of intelligent life when all the while, every being on earth and every smallest particle of matter cries out that its existence comes from one all-sufficient and self-sufficient Source of Existence without Whom nothing **can either be or be intelligible** but Whom the **scientists of today refuse** to acknowledge.

Of all the planets and stars in the cosmos, we on earth and the earth itself are the center of God's attention. Only the earth is designated as God's footstool (**Isaias 66:1; Matthew 5:35; Acts 7:45**). It could hardly be God's footstool if it were whirling around the sun and spinning on its axis. (A metaphor cannot lose its literal reference, its "vehicle," without also losing its entire meaning and significance.) The earth is the place of God's rest.

⁴⁶ James V. Forsee. *The Heliocentric Hoax*. 1998, p.3. Available from the author at St. John's Academy, 3014 S. 3rd Street, Louisville, KY 40208.

Earth is the place of God's rest and of His conquest. He created it and adorned it for man's habitation. In the fullness of time, He took Flesh from the Woman of the Promise and came to live here with Her, His Mother Mary, and His foster-father, Joseph. Then **wicked men** put Him to death and He died here also, for us. The **earth has been sanctified** by God's Blood and by the tears of His Mother. Truly, **we are the center of God's whole attention**, just as an only child is the center of all his parents, solicitude.

He is the King of the earth and all its nations, and Mary is His Queen Mother. You can tell from the photographs of earth from space that we are unique in all the universe. We alone are clothed in the blue of Mary's Mantle. The **earth is not a planet** among other planets. It is **not a planet at all**, for it alone hangs still and immobile here in space where God placed it on the First Day of Creation Week. And we are still here, waiting for His coming -- again.

As a kind of footnote to an addendum, I would like to attempt to clarify some problems that always come up in discussions of creation and evolution by modernist theologians who, like Galileo, bring in St. Augustine as a support for their errors.

First, it is well known that St. Augustine believed that God created all things at once and that "in all the days of creation there is one day" and that this day of **Genesis 1** "is not to be taken in the sense of our day." (*De Genesi ad litteram*, Book 4, chapter 27 *et passim*).

John H. Taylor, S. J., who writes the notes to the English translation of the *De Genesi* (see Note 32) is **infected with the JEDP theory** though it is **now discredited** and discarded by most scholars. Nevertheless, he does enlighten us on many points, particularly on St. Augustine's sources and, of particular interest to us now, on the Latin word *simul*. Apparently, St. Augustine took his idea of the simultaneity of creation from **Ecclesiasticus** (Sirach) 18:1 where it is said that He who lives forever created all things together. The word *simul* which in the Latin means "at one time," "all together," seems to be a mistranslation of the Greek *Koivn* ("commonly," "without exception"). Therefore, a more accurate translation of the line from **Ecclesiasticus** would be: He who lives forever created the whole universe (*RSV*). This is in Vol. I, p. 254, no. 69 to St. Augustine's text in Book 4, chapters 33 and 34.

A close study of St. Basil's *Hesaemeron* reveals that he believe the Six Days of Genesis One to be real days. He was followed closely by St. Ambrose and others. St. Ephraem the Syrian Deacon believed the Six Days to be real days. St. Bonaventure names St. Augustine as differing from other holy writers saying the manner of speaking that considers the days as real days "is more in keeping with the Scriptures and the opinions of the saints, both before and after blessed Augustine." (*Breviloquium*. II. ch.2)

I refer the interested reader to an intensive study of St. Thomas's Treatise on the Six Days (*Summa*, Questions 65 - 74), the 5th chapter of *From the Beginning: Catholics and Protestants on Modern Apostasy*, a work-in-progress [1999] by the present writer.

One can only wonder what the consequences might have been had the Fathers been unanimous in holding a literal six day creation -- as unanimous as they were in holding a geocentric view of the universe. I can only believe that God has permitted the present controversy, represented by the **1909** Biblical Commission ruling, as a further test of our faith in these days of overwhelming intensity of trial. At any rate, the Biblical Commission permitted free discussion of the question as

to whether the word *yom* [day] in **Genesis One** refers to a literal 24-hour day or to a "certain space of time". (D2128)

As to the causal reasons or *rationes seminales* of St. Augustine, Fr. Taylor says that they are "models of which creatures are copies The influence of Plato and the Neoplatonists on Augustine is obvious" (p. 258, note 41). Again, explaining these *rationales* Fr. Taylor says: According to Augustine, in addition to the eternal reasons or causes which are in the Word of God as the divine exemplars of the works He creates, there are also causal reasons implanted by God in the created world, accounting for the generation and growth of the living beings that appear throughout the ages Here Fr. Taylor makes St. Augustine say **things he has not said**: "...that living things made in that original creative act were **not made in actuality** in their own proper substances but only potentially in their causal reasons placed in the earth by the Creator" (pp. 254-255, note 67). This would make St. Augustine say something in contradiction to a canon of *Vatican Council I (1870)* which declares that "All that exists outside of God was, **in its whole substance**, created out of nothing, in the beginning, by God, the Blessed Trinity (D 1805). What St. Augustine says is this:

*Perhaps we ought not to think of these creatures at the moment they were produced as subject to the processes of nature which **we now observe in them**, but rather as under the wonderful and unutterable power of the Wisdom of God, which **reaches from end to end mightily and governs all graciously**. For this power of Divine Wisdom does not reach by stages or arrive by steps. It was just as easy, then, for God to create everything as it is for Wisdom to exercise this mightily power. For through Wisdom all things were made, and the motion **we now see in creatures**, measured by the lapse of time, as each one fulfills its proper function, comes to creatures from those causal reasons implanted in them, which God scattered as seeds at the moment of creation when **He spoke and they were made, He commanded and they were created** (Ps. 32:9).*

*Creation, therefore, **did not take place slowly** in order that a slow development might be implanted in those things that are slow by nature; nor were the ages established at the plodding pace at which they now pass. Time brings about the development of these creatures according to the laws of their numbers, but **there was no passage of time** when they received these laws at creation. Otherwise, if we think that, when they were first created by the Word of God, there were the processes of nature with the normal duration of days that we know, those creatures that shoot forth roots and clothe the earth would need not one day but many to germinate beneath the ground, and then a certain number of days, according to their natures, to come forth from the ground; and the creation of vegetation, which Scripture places on one day, namely the third, would have been a gradual process (Book 4, chapter 33).*

St. Augustine is drawing a very sharp and clear distinction between **the Act of creation** which is a-temporal, and those **temporal processes** that define the nature of the creature and its **natural operations**. He is saying, as St. Thomas will say after him, that **creation is not a process**, is not change, but is an Act of God in Whom there is no change or process or shadow of alteration.

He is also saying that God created every being with a definite nature, a definite "numerical law." He does not mean by this a mathematization of the real such as modern physicists do, but he believed, with Plato, the Pythagoreans and the Neoplatonists that creatures were somehow defined by numbers which were hidden, occult, arcane. However, this mysticism of number did not prevent

St. Augustine from having a true idea of the nature of beings. Thus, he plainly teaches that God created plants already full-grown and full-rooted, with an "**apparent age**" as the creationists term it. Otherwise, he says, not one but many days would have been required for the plants to come to maturity. But the power of Divine Wisdom does not need time. God created all things, as *Vatican Council I (1870)* declares, **in their whole substance**, in the beginning.

Substance here refers both to the individual being itself and to the form that defines and determines the nature, essence, genera and species of each kind of being. Thus God created, in the beginning, individuals of **every genus, species and variety** and implanted in them, at their creation, what St. Augustine calls **seminal reasons** or **causal principles** and which St. Thomas, using Aristotelian terminology, will call the **material-formal causes**. In both cases, these are the laws that limit and define the kinds of beings created in the beginning and that continue to exist today by generation from those original pairs. St. Augustine is very emphatic about these limits of the creature's nature. Here are just a few examples, and they could be multiplied: For the perfection of each thing according to the limits of its nature is **established in a state of rest**, that is, it has a fixed orientation by reason of its natural tendencies, not just in the universe of which it is a part, but more especially in Him, to whom it owes its being, in whom the universe itself exists (Book 4, chapter 18). **No possibility of evolution** there! God, then, remaining in Himself, draws back to Himself whatever He has made, so that every creature has within itself the limit of its nature, by which it is distinct from God, but in God it has its place of rest, by which it maintains its nature and identity (Book 4, chapter 18). By its **place of rest**, St. Augustine is indicating the **unchangeability** of the created nature or form or exemplar idea that God has of it. Less and less possibility of any type of evolution finding support in St. Augustine. And finally:

*But if we should suppose that God now makes a creature without having implanted its kind (**genus**) in His original creation, we should flatly contradict Sacred Scripture, which says that on the sixth day God finished all His works. For it is obvious that in accordance with kinds of creatures which He first made, God makes many new things which He did not make then. But we cannot believe that He establishes a new kind, since He finished all His works on the sixth day (Book 5, chapter 20).*

The **new things** created by God are, of course, **human souls**, and the new things made by Him are all the beings that come into existence through the **natural powers of generation** given and immediately co-operated by God as primary agency and cause.

So, there is no way that evolutionists can bring in St. Augustine to support their error without serious distortion of his thought. And, of course, the same must be said of those who, like Galileo, strive to find support in him for a Copernican or a Newtonian or an Einsteinian universe.

But the definitive defense of St. Augustine against the evolutionists is that of Etienne Gilson whose work is of the highest authority. In his book on St. Augustine's philosophy, Gilson says:

*As to their nature, the seeds or seminal reasons are essentially humid, i. e., they belong to the element, water, one of the four created by God at the beginning. But in addition to this nature, seminal reasons possess a principle of activity and development that is the cause of their fruitfulness. In keeping with his Platonic metaphysics, which Scripture confirms (**Wisdom 11:21**), Augustine looks upon them as numbers which bring with them for development in time the efficacious forces contained in the works God finished before*

that our bodies share in either the rewards or the punishments of eternity by reason of their very union with the soul. I can only suggest the following lines of thought and invite all my readers also to give the subject their prayerful study.

1. According to the *First Law of Thermodynamics* and the teaching of **Genesis 2:1-3**, no **new matter** has ever been created. But what is it that comes to be in generation, in growth and development? The parent cells unite and begin to multiply. The parent cells have been produced from the parent bodies and ultimately, as to their matter, from the earth, by way of nutrients from plants and animals. This earth is the terrestrial matter that God created in the beginning.

But if our individual matter, our own particular bodies, are simply re-arrangements of atoms and molecules created by God in the beginning, how will we be given back our own individual body in the resurrection, for these same molecules and atoms also formed the bodies of other people?

2. There is no actually existing matter without form. Form, unlike matter, is a principle of **being**, of perfection, and of **stability** while matter is a principle of change, of alteration, and of potentiality for **all sorts of variations** within a limited nature.

In man, the soul is the **rational substantial form** of the body. It is the form that holds together all the parts of the body and gives them the life of the whole organism as well as their specific identity as this individual being and this kind of individual being.

Therefore, this individual body receives from its form a **unique quality** that will endure forever in its glorified reunion with the soul when the corruptibility of matter will be no more.

It is true that matter is the principle of individuation -- but can matter overwhelm the primacy of form and quality? Material individuation is just that -- material. And so, may we not say that form, insofar as it transcends the quantity of matter, is the key to the individual's most real identity -- an identity that extends even to the body by virtue of the primacy of form? If so, then it would seem that we may with confidence assert **the primacy of form and of quality** over matter and quantity and thus advance towards a restoration of the hierarchy of substances and accidents.

3. Scripture tells us: "If then any be in Christ a new creature, the old things are passed away, behold all things are made new." (**2 Cor. 5:17**) St. Paul speaks here of the new life of divine grace given us in Baptism and **elevating us to the supernatural order** of God's friendship. This new life co-exists with the natural order of corruption, of sickness and death in this life, and while it cannot eliminate it, it can transcend it just as form transcends matter and as grace both transcends and transforms nature, as we see in the lives of the saints.

4. Lastly, there is the final new creation, and it also involves matter. This is the final resurrection:

But we look for new heavens and a new earth according to His promises, in which justice dwelleth. (2 Peter 3:13)

And I saw a new heaven and a new earth. For the first heaven and the first earth were gone, and the sea is now no more. And I John saw the holy city, the new Jerusalem, coming down out of heaven from God, prepared as a bride adorned for her husband (Rev. 21:1-2)

And He that sat on the throne said: "Behold, I make all things new." (Rev. 21:5)

The mystery remains, however. Will the glorified matter of my body somehow share the glorified matter of your body? Perhaps the mystery is that of the Mystical Body of Christ. Perhaps we are more like members one of another" (**Eph. 4:25**) than we can begin to realize on this earth!

5. There is **one other possibility** which I favor. It is this: In the beginning God created all the matter of the universe, as Scripture and the *First Law of Thermodynamics* both teach. We have no idea how much matter God created, and it is only the limitations of our minds that tend to prescribe lesser rather than greater limits. But **is it not possible** that the amount of matter God created in the beginning has **not yet been used up** by human beings in their bodies?

There is a theological opinion that the world will end when the places left vacant by the fallen Angels have all been filled by human beings in Heaven. May there not be a similar situation posed by created matter? **The world will end** when **all the matter created** by God in the beginning **has been possessed, informed and sanctified** by human beings. Then there are those who are lost in Hell. They also will have their bodies back in the resurrection.

Wallace Johnson [1916-1989], Australian Catholic creationist, once said, in opposition to the long ages of evolutionary time, that if the evolutionists were right and man had been on earth for the length of time they require (200,000 years is the estimate of evolutionist Fr. Anthony Zimmerman) the land would be **stiff with human bones**. But such is not the case. Mankind has not been on earth for more than 10,000 years at the most and more likely only 6,000 years according to most Bible chronologies.

Therefore, it seems entirely safe to say that the matter created by God in the beginning has not yet been used up by human beings. And this matter, we might add, is specifically the matter of **the earth**, of the soil from which we derive our nutrients. It in no way involves the matter of the celestial bodies. Thus the ancient Aristotelian-Thomistic and Scriptural distinction between terrestrial and celestial matter is preserved.

This is **second** in the trilogy of studies:

- I. *Galileo's Heresy*
- II. *Galileo's Empiricism*
- III. *Was It / Is It Infallible ?*

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