# CODDWhere Do We Come From?AndAndBODD<t

Dr. Gerard M. Verschuuren

# GOD and EVOLUTION? SCIENCE MEETS FAITH

Dr. Gerard M. Verschuuren

With a Foreword by Carlos A. Sevilla, SJ



### CHAPTER I

The Roman Catholic Position

## 1.1 What the Church Teaches About Faith and Reason

The Roman Catholic Church has always stood behind the motto of "Faith *and* Reason," which goes at least as far back as the martyr Saint Justin (103–165). The First Vatican Council condemned the doctrine that faith is irrational; it insisted that faith is always in harmony with reason (but need not be subject to scientific demonstration). Some people think that when we begin to use reason, we have no choice but to abandon faith; conversely, they think that if we have faith, we cannot use reason. The Church teaches differently: discovering the truth through reason can never destroy faith. Pope Benedict XVI has made faith and reason all the more prominent in the Church. In so doing, he continues the tradition of his predecessor, Pope John Paul II, who issued the encyclical *Fides et Ratio* on the relationship between faith and reason. To put the message briefly, Catholics are supposed to be reasonable in their faith, and faithful in their reasoning. Our minds should work in the light of reason as well as in the light of faith.

May we also apply this motto of Faith and Reason to the issue of religion and science? Certainly! The Catholic Church has a longstanding record of honoring both religion (faith) and science (reason). Around 400, Saint Augustine wrote: "It not infrequently happens that something about the earth, about the sky,... about the nature of animals, of fruits, of stones, and of other such things, may be known with the greatest certainty by reasoning or by experience, even by one who is not a Christian."<sup>1</sup> But this belief became even more explicit with Saint Albert the Great (or Albertus Magnus, 1206–1280), a scientist and a doctor of the Church. Albert was the teacher of another *doctor of the Church*, Saint Thomas Aquinas. As a scientist, Albert had quite a track record for his time: in addition to his theological works, he discovered the element arsenic; experimented with photosensitive chemicals, including silver nitrate; and made disciplined observations in plant anatomy and animal embryology. In all his works, he advocated the peaceful coexistence of science and religion, advising us to turn to a theologian in matters of faith, but to a physician or scientist in matters of medicine or physics. He explicitly proclaimed that faith and reason can never contradict each other.

Although he did not do experiments as his teacher did, Saint Thomas Aquinas followed in his footsteps. Aquinas may not have put his foot inside the gates of science, but "he certainly pioneered a crucial phase of the march toward those gates."<sup>2</sup> Saint Thomas made it very clear that reason can never arrive at a conclusion opposed to faith, because God himself created the reasoning mind. In saying this, Aquinas cleared the way for science as well.

But before science could become the kind of science we know today, some hurdles remained. A major obstacle was the great impact the ancient Greek philosophers Aristotle and Pythagoras still had through their works—which came down to us through the Christian monks who had laboriously copied them. Aristotle and Pythagoras believed that the world is the way it is because it must be that way; nature is supposed to dance to the tune of those philosophers, for no deity could have created a world in defiance of Aristotelian or Pythagorean philosophy, period! But Christians had started to see the world differently. Two of them in particular, the Franciscans Roger Bacon (c. 1214–1294; not to be confused with the philosopher Francis Bacon) and William of Ockham (c. 1280–1349)—both following in the footsteps of another early scientist, Bishop Robert Grosseteste (1175–1253)—said that we cannot assume that God did

<sup>1.</sup> The Literal Meaning of Genesis, 1:19.

<sup>2.</sup> Stanley L. Jaki OSB, The Road of Science and the Ways to God (Chicago: University of Chicago Press, 1978), 39.

things the way we think he ought to have, since God can do whatever he likes. The person who wants to have dominion over nature must begin by listening, observing, and respecting God's acts in creation. It is only in this way that the astronomer Copernicus could later come up with the daring declaration that nothing was easier for God than to have the earth move, if he so wished.

Therefore, the only way to find out what God has actually done is to go out and look—in other words, to do experiments. Bacon performed and described various experiments (for example, he manufactured gunpowder, worked extensively with lenses, and used a *camera obscura* to observe solar eclipses); understandably, he urged theologians to study all sciences closely, strongly championing experimental study over reliance on authority. In this Catholic view (basically dating back to Saint Augustine), the universe was seen as a law-abiding structure because it had been created by a lawful God. The Book of Genesis teaches us that the universe was created by a rational intellect that is capable of being rationally investigated. This means that the universe is open to analysis by reason, including science, as the universe was created according to the Creator's mind.

Although many may call the Middle Ages the "Dark Ages," they were not dark; if they seem dark, it's more by lack of historical sources than by a void of culture. The Church kept the candle of learning alive in her monasteries and universities. During the Middle Ages the scientific method was born, and science became a formal discipline separate from philosophy. It is because of Church scholars such as the Dominicans Albert the Great and Thomas Aquinas, along with the Franciscans Roger Bacon and William of Ockham and their followers, that the West could carry on the spirit of scientific inquiry, which enabled science to emerge and prosper, and would later give rise to Europe's taking the lead in science.

The popes have confirmed this long-standing tradition in the Catholic Church of advocating the peaceful coexistence of science and religion. Writing more than a hundred years ago, Pope Leo XIII (1878–1903)<sup>3</sup> said:

There can never, indeed, be any real discrepancy between the theologian and the physicist, as long as each confines himself within his own lines ...

<sup>3.</sup> The years given for the popes indicate their pontificates. Ed.

If dissension should arise between them ... we must remember, first, that the sacred writers, or to speak more accurately, the Holy Ghost "Who spoke by them, did not intend to teach men these things (that is to say, the essential nature of the things of the visible universe), things in no way profitable unto salvation" (Saint Augustine, *The Literal Meaning of Genesis*, 2:9, 20). Hence they did not seek to penetrate the secrets of nature, but rather described and dealt with things in more or less figurative language, or in terms which were commonly used at the time, and which in many instances are in daily use at this day, even by the most eminent men of science.<sup>4</sup>

Pope Pius XI (1922–1939) promoted a renewed dialogue between science and religion. In 1936 he reestablished the *Pontifical Academy of Sciences* to support serious scientific study within the Catholic Church. On that occasion, the pontiff said:

Science, when it is real cognition, is never in contrast with the truth of the Christian faith. Indeed, as is well known to those who study the history of science, it must be recognized that the Roman Pontiffs and the Catholic Church have always fostered the research of the learned in the experimental field.<sup>5</sup>

Pope Pius XI gave his last pontifical address at this academy, which focuses on the harmonious relation between science and religion. In it, he quoted from the Book of Wisdom: "you have disposed all things by measure and number and weight" (11:20)—and then the Holy Father continued:

It is like going into an immense laboratory of chemistry, of physics, of astronomy. Few indeed can admire the profound beauty of such words as well as those who make sciences their profession. . . . The created world receives weight, number, and measure through the hands of God. This is true for everything: for the greatest as much as for the smallest. <sup>6</sup>

His successor, Pope Pius XII, continued this Catholic approach. The pontiff categorically stated that "true science discovers God in an ever-increasing degree—as though God were waiting behind every door opened

<sup>4.</sup> Leo XIII, Providentissimus Deus, no. 18.

<sup>5.</sup> Pius XI, Motu Proprio, AAS 28, 1936, 427.

<sup>6.</sup> Pius XI, Address to the Plenary Session of the Academy: "The Complex Subject of Science Is the Reality of the Created Universe," December 18, 1938.

by science."<sup>7</sup> And John Paul II once again emphasized the role and goals of the Academy with these words as "a visible sign, raised amongst the peoples of the world, of the profound harmony that can exist between the truths of science and the truths of faith."<sup>8</sup>

The Catholic Church has no fear of science or scientific discovery, but stands in a long tradition of defending the position that faith and reason or religion and science, for that matter—do not contradict but rather complement each other as coming from the same source: God. The Church unquestionably acknowledges that God speaks to us in two different ways: That is, through the Book of Scripture as well as through the Book of Nature—both coming from the same source: God.

Standing within this strong and solid tradition, Vatican II declared that "if methodical investigation within every branch of learning is carried out in a genuinely scientific manner and in accord with moral norms, it never truly conflicts with faith, for earthly matters and the concerns of faith derive from the same God."<sup>9</sup>

This view is well put and summarized in the *Catechism of the Catholic Church*:

[M]ethodical research in all branches of knowledge, provided it is carried out in a truly scientific manner and does not override moral laws, can never conflict with the faith, because the things of the world and the things of the faith derive from the same God. The humble and persevering investigator of the secrets of nature is being led, as it were, by the hand of God in spite of himself, for it is God, the conserver of all things, who made them what they are.<sup>10</sup>

How does all of this relate to the issue of creation and evolution? The *Catechism of the Catholic Church* touches only briefly on the issue of evolution. It says:

The question about the origins of the world and of man has been the object of many scientific studies that have splendidly enriched our knowledge of the age and dimensions of the cosmos, the development of life-forms and

<sup>7.</sup> Pius XII, Address to the Pontifical Academy of Sciences, November 22, 1951.

<sup>8.</sup> John Paul II, Address to the Pontifical Academy of Sciences, November 10, 1979.

<sup>9.</sup> Gaudium et Spes, 36.

<sup>10.</sup> Catechism of the Catholic Church (hereafter cited as CCC), 2nd ed. (Washington, DC: United States Conference of Catholic Bishops, 2006), no. 159.

the appearance of man. These discoveries invite us to even greater admiration for the greatness of the Creator, prompting us to give him thanks for all his works and for the understanding and wisdom he gives to scholars and researchers.<sup>11</sup>

Again, these insights about the relationship between creation and evolution have a much longer history. Although there had been lesser interventions on the subject of evolution before, in 1950 Pope Pius XII issued the encyclical *Humani Generis*, in which he declared that opinions favorable and unfavorable to evolution must be carefully weighed and judged. He did, however, speak against certain philosophical and evolutionary ideas, particularly some associated with the Jesuit paleontologist Pierre Teilhard de Chardin, who had nearly made evolution into a semireligion by proclaiming the absorption of all humans in an ongoing evolution toward his so-called Omega Point. At the same time, the Holy Father gave the most authoritative statement to that date regarding the possibility of Catholics holding certain versions of evolutionary theory. He wrote:

The Teaching Authority of the Church does not forbid that—in conformity with the present state of human sciences and sacred theology —research and discussions, on the part of men experienced in both fields, take place with regard to the doctrine of evolution, in as far as it inquires into the origin of the human body as coming from pre-existent and living matter—for the Catholic faith obliges us to hold that souls are immediately created by God. However, this must be done in such a way that the reasons for both opinions, that is, those favorable and those unfavorable to evolution, be weighed and judged with the necessary seriousness, moderation, and measure, and provided that all are prepared to submit to the judgment of the Church, to whom Christ has given the mission of interpreting authentically the Sacred Scriptures and of defending the dogmas of faith.<sup>12</sup>

### In April 1985, Pope John Paul II addressed a symposium on evolution:

Rightly comprehended, faith in creation or a correctly understood teaching of evolution does not create obstacles: Evolution in fact presupposes creation; creation situates itself in the light of evolution as an event which extends itself through time—as a continual creation—in which God becomes visible to the eyes of the believers as "Creator of heaven and earth."<sup>13</sup>

<sup>11.</sup> Ibid., no. 283.

<sup>12.</sup> Pius XII, Humani Generis, no. 36.

<sup>13.</sup> Address to a symposion on evolution, April 1985.

Several months later, the same pope declared during a general audience:

All the observations concerning the development of life lead to a similar conclusion. The evolution of living beings, of which science seeks to determine the stages and to discern the mechanism, presents an internal finality which arouses admiration. This finality, which directs beings in a direction for which they are not responsible or in charge, obliges one to suppose a Mind which is its Inventor, its Creator.<sup>14</sup>

The following year, the Holy Father reiterated his view regarding the relationship between creation and evolution:

... from the viewpoint of the doctrine of the faith, there are no difficulties in explaining the origin of man in regard to the body, by means of the theory of evolution. But it must be added that this hypothesis proposes only a probability, not a scientific certainty.

However, the doctrine of faith invariably affirms that man's spiritual soul is created directly by God. According to the hypothesis mentioned, it is possible that the human body, following the order impressed by the Creator on the energies of life, could have been gradually prepared in the forms of antecedent living beings. However, the human soul, on which man's humanity definitively depends, cannot emerge from matter, since the soul is of a spiritual nature.<sup>15</sup>

Then, in 1996, John Paul II addressed the subject of evolution again. The general tone of the address was positive but cautious. He said positive things about science but also stressed the limits of science in regard to human origins. In addition, he discussed various interpretations of human evolution that are incompatible with the Catholic faith. He explained that materialistic, reductionistic, and spiritualistic versions of evolutionary theory cannot be reconciled with Christianity. These are philosophies, he noted, not science. As such, they are subject to philosophical refutation. The final judgment regarding their truth or falsity belongs to philosophy and, in a certain way, to theology. But regarding the scientific part of evolution, he said:

Today, almost half a century after the publication of the encyclical [*Humani Generis*, 1950], some new findings lead us toward the recognition of evolution as more than a hypothesis. It is indeed remarkable that this theory has been progressively accepted by researchers, following a series of discoveries in various fields of knowledge. The convergence in

<sup>14.</sup> John Paul II, general audience, July 10, 1985.

<sup>15.</sup> John Paul II, general audiences, January 29 and April 16, 1986.

the results of these independent studies—which was neither planned nor sought—is in itself a significant argument in favor of this theory.<sup>16</sup>

In the fall of 2004, the International Theological Commission (ITC, a Pontifical Commission in the Vatican) touched on issues of creation and evolution:

Since it has been demonstrated that all living organisms on earth are genetically related, it is virtually certain that all living organisms have descended from this first organism. Converging evidence from many studies in the physical and biological sciences furnishes mounting support for some theory of evolution to account for the development and diversification of life on earth, while controversy continues over the pace and mechanisms of evolution.<sup>17</sup>

In other words, exactly *how* and *how fast* evolution occurred remain controversial issues, but *that* evolution happened the commission seems to accept.

In 1995, then-Cardinal Joseph Ratzinger published a series of homilies on creation. He argued there that we shouldn't speak of "creation or evolution," but of "creation *and* evolution" (emphasis added). He also referred to what he called "the inner unity of creation and evolution, and faith and reason."<sup>18</sup> During his pontificate, Benedict XVI has—like his predecessor—consistently opposed the misguided notion that evolution somehow proves there is no God who created us in love. In his first homily as pontiff, in 2005, he insisted: "We are not some casual and meaningless product of evolution. Each of us is the result of a thought of God. Each of us is willed, each of us is loved, each of us is necessary."<sup>19</sup>

On July 26, 2007 Pope Benedict XVI was more specific; he said to 400 priests at a two-hour event that he is puzzled by the current debate in the United States and his native Germany over creationism and evolution. He told them that debaters wrongly present the two sides

as if they were alternatives that are exclusive—whoever believes in the creator could not believe in evolution, and whoever asserts belief in evolution would have to disbelieve in God.... This contrast is an absurdity, because

<sup>16.</sup> John Paul II, Address to the Pontifical Academy of Sciences, October 22, 1996.

<sup>17.</sup> International Theological Commission, Communion and Stewardship: Human Persons Created in the Image of God, 2004, no. 63.

Joseph Ratzinger, In the Beginning, trans. Boniface Ramsey (Grand Rapids: Eerdmans, 1995).
Benedict XVI, Homily at the Mass for the inauguration of his pontificate, April 24, 2005.

there are many scientific tests in favor of evolution, which appears as a reality that we must see and [which] enriches our understanding of life and being. But the doctrine of evolution does not answer all questions, and it does not answer above all the great philosophical question: From where does everything come?<sup>20</sup>

In conclusion, the popes of the past century have had little trouble in aligning their teaching with evolutionary theory, and Catholic theologians from Cardinal John Henry Newman to Cardinal Avery Dulles easily equated their religious faith and biblical scholarship with the advance in evidence for evolution.

So why do many Catholics still feel uncomfortable with the issue of evolution? Not so long ago, many Catholics in the pews understood that evolution was somehow consistent with Church teaching. What has changed is not Church teaching, or evolutionary theory, but the fact that non-Catholic fundamentalists and evangelicals now have an enormous impact on our culture, as has their rejection of evolution, making Catholics feel they must be suspicious of evolution if they want to be faithful to their religion. But something else has also changed recently: the appearance of atheists who use evolutionary theory as their favorite tool in battling Christian faith. Some of them are influential writers on evolution —biologists such as Richard Dawkins, whose books, in which he declares a war against religion, have sold millions of copies.

Many evangelical Christians responded by attacking *evolution* (instead of the ideology of those atheists) as the greatest threat to their beliefs. So the issue of evolution has become highly suspect, even with Catholics—no matter what Roman pontiffs and prominent Church theologians and cardinals have said to the contrary.

Some Catholics may still think that evolution is not compatible with Catholic teaching. Yet, whether evolution occurred or not is an issue for the biological sciences to determine; and they have done so, as we will see later on in this book. But we can also conclude that these pontiffs and theologians deem at least some forms of evolutionary theory to be compatible with the Catholic faith. If one rejects evolution altogether—not just some philosophically erroneous versions of it—one must do so on grounds other than incompatibility with Christianity. So we should be

<sup>20.</sup> Benedict XVI, meeting with the clergy.

cautious in rejecting evolution, for Saint Augustine once warned us that it is "dangerous to have an infidel hear a Christian ... talking nonsense."<sup>21</sup> One would indeed need very strong reasons to dissent as a Christian or Catholic.

For that reason, I would suggest we look in the Book of Scripture as well as in the Book of Nature for an answer to the life-size question: Where do we come from?

### Delving Deeper =

What About the Galileo Conflict?

Perhaps you have reservations about whether the Church has always been "reasonable" in honoring faith and reason. What about the conflict between Galileo and the Church? Was it a reasonable debate? Yes, it probably was—more so than some might like to hear. True, some theologians at the time did base their attacks against Galileo on a few lines in the Bible, translated poorly, taken literally, interpreted wrongly, and/or taken out of context—in texts such as Psalms 93:1 and 104:5, which say that God created the earth so it can never be "moved." The Hebrew word used here means "to falter, shake, wobble, slip, or slide"; so perhaps "shaken" would be a better translation than "moved." The core message here is that God is the Creator of this world, so nothing really terrifying or earth-shaking can ever happen to his creation, because we are in good hands. Those theologians should have been more cautious.

The problem in the Galileo conflict was not about a "flat earth." Pythagoras and others had already assumed that the earth was a sphere. Although Saint Basil the Great declared it a matter of no interest to us whether the earth is a sphere or a cylinder or a disk or concave in the middle like a fan, influential Christian thinkers such as Saint Clement, Origen, Saint Ambrose, Saint Augustine, and Saint Thomas Aquinas all accepted that the earth was a globe.<sup>22</sup>

<sup>21.</sup> The Literal Meaning of Genesis, 1:20.

<sup>22.</sup> For a good analysis of this issue, see James Hannam, God's Philosophers: How the Medieval World Laid the Foundations of Modern Science (London: Icon Books, 2010).

A more serious problem, however, was the heliocentric model (with the sun in the center) versus the old geocentric model (with the earth in the center). Copernicus was the first to publish the idea of a heliocentric model in 1543, suggesting that the earth orbited the sun. But because, like Ptolemy (c. A.D. 90–168), he insisted on circular orbits, his heliocentric model was no more accurate than Ptolemy's geocentric one. Johannes Kepler improved the model by using the Copernican system but adding elliptical orbits. As his writings make clear, Kepler had been inspired by his faith to figure out a perfect system, because he knew God would not tolerate the inaccuracies that plagued the other models. Yet, Kepler was persecuted by the Protestant Faculty at Tübingen and took refuge with the Jesuits in 1596. Martin Luther dismissed Copernicus as "that fool," and the theologian Phillip Melancthon condemned Copernicanism as "dishonest" and "pernicious."

Then Galileo entered the scene. In 1632, he published, with papal permission, a book called Dialogue Concerning the Two Chief World Systems. In it, he supported Copernicus rather than Kepler, so Galileo's heliocentric model was also not any better than Ptolemy's geocentric one. In addition, he ran into trouble because of a perceived insult concerning the Pope in his book. When tried by the Holy Office, Galileo refused to adopt Kepler's system, because his Pythagorean philosophy forced him to stick with "perfect" circles rather than "imperfect" ellipses (making him advocate circular motions of a spherical earth)-so he lost even the scientific argument. In addition, he argued that the tides were a direct consequence of the earth's motion-which is inconsistent even with his own principles of dynamics. From then on, it went downhill. Galileo was forced to renounce his opinions, but refused to do so, and so was confined to his home for the rest of his life. Pope John Paul II speaks of a "Tragic mutual incomprehension."23 This part of Church history is certainly not one of the best—a human drama played out by a cast of flawed and finite characters on both sides.

Under the surface, though, much more was going on in this debate. Many Jesuit astronomers actually agreed with the new astronomy. On his own account, Galileo regarded the Jesuits of the Roman College, the leading astronomers of the day, as modern-minded humanists, friends of

<sup>23.</sup> Speech on October 1, 1992, to the Pontifical Academy of Sciences.

science and discovery. <sup>24</sup> The Jesuits actually had better telescopes than he did, so Galileo was happy to receive one of theirs as a gift. In time, however, he would lose their support because of a dispute over comets with the Jesuit mathematician-astronomer Fr. Horatio Grassi (who would eventually turn out to be right). The frequency and acidity of Galileo's attacks played an important role in causing many Jesuits to withdraw their support of Galileo—which he later would need so badly. What irked Church officials was not so much what Galileo was saying, but how he was saying it.

Like the Jesuit astronomers, many theologians at the time were "modern-minded." One of the main players in the debate was Saint Robert Bellarmine, a Jesuit cardinal. He distinguished two types of astronomy:<sup>25</sup> On the one hand, he recognized a mathematical astronomy that tries to come up with systems that do justice to astronomical phenomena. On the other hand, he singled out a physical astronomy that seeks to ascertain which mathematical systems actually apply to the physical structure of the heavens. The cardinal's reasoning was logical and perfectly correct: the same set of facts may be consistent with different (mathematical) theories, so we need to figure out which theory is true. Bellarmine deemed it harmless to claim that the sun is in the center if one uses a mathematical approach. But such a claim, he said, would require much more evidence, if one were to claim this to actually be the case in a physical sense. He wrote, "if there were a true demonstration that ... the sun did not go around the earth but the earth went around the sun, then it would be necessary to use careful consideration in explaining the Scriptures that seemed contrary."26 All he required was stronger scientific evidence.

Indeed, the scientific case was not as clear as some think. If we use Aristotelian theories of impulse and relative motion, the theory advanced by Copernicus, as well as by Galileo, appears to be falsified by the fact that objects fall vertically on earth rather than diagonally (the famous so-called tower argument). Additional facts seemed to confirm that the earth did not move, for if it did, the clouds would be left behind (as Galileo himself

<sup>24.</sup> See William Wallace, *Galileo and His Sources* (Princeton University Press, 1984). See also Arthur Koestler, "The Greatest Scandal in Christendom," *The Observer*, London, February 2, 1964, 21.

<sup>25.</sup> E.g. in his letter of April 12, 1615, to Fr. Foscarini—as a reaction to Galileo's "Letter to Christina."

<sup>26.</sup> In his letter to Fr. Foscarini.

had remarked in a lecture of 1601). As the late University of California at Berkeley philosopher of science Paul Feyerabend pointed out, one could even state that Galileo's opponents kept closer to reason than Galileo himself.<sup>27</sup> Galileo actually introduced theories that are inconsistent with well-established facts. The observation that objects fall vertically on earth required a new interpretation to make it compatible with Copernican theory. Galileo was able to make such a change about the nature of impulse and relative motion, but before such theories were articulated, he had to use ad hoc methods and proceed counter-inductively—in defiance of reason, given the knowledge available at the time. He even had to reluctantly admit that his mentor Copernicus had committed what Galileo called "a rape of the senses."

In reality, there was a battle going on behind the scientific scenes: the power of formal sciences such as mathematics versus the power of empirical sciences—the latter depending on observational tools such as telescopes (and microscopes), which must first prove their reliability. Like students who use a microscope for the first time and see hardly anything, astronomers must learn to use telescopes. When Galileo demonstrated his simple telescope to twenty-five professors in Bologna (1610), all admitted the instrument seemed to deceive; some fixed stars were actually seen double. Even Galileo conceded in a letter to Kepler that many people were unable to see what they were "supposed" to see through his telescope. Ironically, Galileo would refer to comets as "optical illusions," when he thought it would suit him well during his dispute about comets with Fr. Grassi.

We must also realize that no good optical theory was available to explain the working of telescopes until the work of René Descartes, Isaac Newton, and Christiaan Huygens (after 1650). So understandably, many scientists thought that all the things the new telescope showed them could only be artifacts or optical illusions. A tube that only shows what cannot exist would not be a very reliable tube, right? Again, the debate seems basically reasonable, no matter how awful the final outcome concerning Galileo may appear.

Yet, we should also acknowledge that the Church has learned from this experience. Undoubtedly, the Church at the time could and should have

<sup>27.</sup> Paul Feyerabend, Against Method: Outline of an Anarchistic Theory of Knowledge (New York: Verso Books, 1975), ch. 13.

listened more intently to its doctors of the Church, dedicated advocates for a peaceful coexistence of science and religion. Pope Pius XII called Galileo one of the "most audacious heroes of research . . . not afraid of the stumbling blocks and the risks on the way."<sup>28</sup> And in 1983, Pope John Paul II said that the Galileo case had led the Church "to a more mature attitude and a more accurate grasp of the authority proper to her," enabling her better to dis-tinguish between "essentials of the faith" and the "scientific systems of a given age."<sup>29</sup> Perhaps Saint Albert's promotion of a peaceful coexistence of science and religion should have been taken more seriously much sooner.

<sup>28.</sup> Pius XII, Address to the Pontifical Academy of Sciences, 1939.

<sup>29.</sup> John Paul II, Address to an International Symposium on the Occasion of the 350th Anniversary of the Publication of Galileo's Dialogue Concerning the Two Chief World Systems, May 9, 1983.