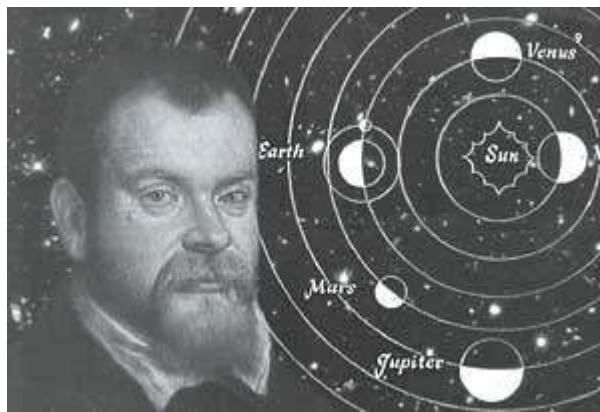


The ANGELUS

October 2003 Volume XXVI, Number 10

Galileo: Victim or Villain?

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I, Galileo, son of the late Vincenzo Galilei, Florentine, aged 70 years,...having before my eyes and touching with my hands the Holy Gospels, swear that I have always believed, do believe, and with God's help will in the future believe all that is held, preached and taught by the Holy Catholic and Apostolic Church.¹

Thus began one of the most famous - in many circles, infamous - personal declarations of all time.

These are the first words in the public abjuration of the world-renowned mathematician Galileo Galilei before the Holy Office of the Inquisition. The date was June 22, 1633, and Galileo had just been sentenced by the Inquisition in respect to the publication of a book in which he clearly taught "that the Sun is the center of the world and does not move from east to west and that the earth moves and is not the center of the world."² In fulfillment of the first part of his sentence, and to be absolved of the suspicion of heresy and disobedience, he continued:

With sincere heart and unfeigned faith I abjure, curse, and detest the aforesaid

errors and heresies and generally every other error, heresy and sect whatsoever contrary to the Holy Church, and I swear that in the future I will never again say or assert, verbally or in writing, anything that might furnish occasion for a similar suspicion regarding me.⁴

With the completion of his formal abjuration, Galileo was to be imprisoned and required to recite the seven penitential psalms weekly for three years.

This much is clear. All of the above is part of the historical record, part in fact, of the final proceedings of the trial of Galileo before the Holy Inquisition. But it is at this point that confusion enters; for few trials have been as misunderstood, misrepresented, and entirely abused as Galileo's. Historians and scientists alike have heralded the interaction of Galileo and the Church as the commencement of the fight of science versus faith, reason versus authority and superstition. In our post-Christian world, the debate thus characterized has become one of good versus evil with the moribund Catholic Church playing the role of antagonist.

A popular account of the Galileo Affair would proceed as follows: Galileo, a scientist of highest rank, proved the theory advanced by Copernicus in the 16th century, namely that the sun is the center of the world around which the earth revolves annually while rotating on its axis. The Catholic Church, which held to the geocentric model wherein the earth is static, condemned Galileo as a heretic for his claim. He was then tortured, threatened with execution until he recanted, imprisoned for life, blinded and refused Catholic burial. The Church, as though to prove her intransigence and her enmity toward science, refused to allow heliocentrism (sun-centered universe) to be taught until the 19th century when Galileo's book *Dialogue Concerning the Two Chief World Systems* was finally taken off of the Index of Forbidden Books.⁵

The implications of this popular portrayal of events are profound for several reasons. Firstly, in terms of apologetics, if the Church indeed pronounced solemnly that the Earth does not revolve around the sun, then she almost certainly would have erred.⁶ Naturally, this situation would eliminate her claim of infallibility, which would in turn destroy her claim of Divine institution. An alternative interpretation, if we want to protect the Church's claim of inerrancy, might be to allow a plurality of contradictory truths. In other words, one might say that by faith we believe one thing, by science we believe the opposite.⁷ Thus, we would concede that science and religion are indeed incongruent, but not necessarily incompatible. However, this too is unacceptable, because there is unity in truth. The Church cannot hold true that which is opposed to a truth of science. One or the other must be false since God is the author of all truth and cannot contradict Himself.

But, beyond the questions about science and religion, what does this rendition of the Galileo case portend for the reputation of the Catholic Church? Did she really just arbitrarily condemn a man to life imprisonment in order to thwart a

scientifically proven truth? Was there any reason for what happened beyond a simple desire to continue to freely propagate her own errors? How should a Catholic respond when confronted with such accusations concerning this whole affair?

Whatever they can really demonstrate to be true of physical nature we must show to be capable of, reconciliation with our Scriptures; and whatever they assert in their treatises which is contrary to these Scriptures of ours, that is to the Catholic faith, we must either prove it as well as we can to be entirely false, or at all events We must, without hesitation, believe it to be so.

-St. Augustine²

In the course of this essay, we will elucidate the answers to these questions and objections by: **1)** providing the historical context outside of which no event of this magnitude can be understood; **2)** correcting factual errors and misconceptions; and finally **3)** drawing some conclusions and inferences based on what we have found.

Context Part I: PERSONAL Galileo the Man

Galileo was born in the Italian city of Pisa in 1564. Though it is often overlooked, he was raised and always remained a loyal Catholic, even joining for a year the Vallambrosan Order as a novice around the age of 14.⁸ Although he failed to earn a university degree for financial reasons, Galileo doggedly pursued studies of mathematics and mechanics on his own. By the age of 25, he had invented a hydrostatic balance, written a highly praised essay on "the center of gravity in solid bodies," and had won the attention of some high-ranking scholars and clerics including the great Jesuit mathematician Christopher Clavius and the Marquise Guidubaldo del Monte, the brother of Cardinal Francesco Maria del Monte. Withal, in 1589, at age 25 he obtained a position as Professor of Mathematics at the University of Pisa. Three years later, Guidubaldo assisted in gaining for him an appointment to the chair of Mathematics at the University of Padua, where he remained for 17 years. Later, seeking greater freedom to research and fewer teaching responsibilities, Galileo looked to remove to Florence in Tuscany. In hopes of gaining a position there,

he went so far as to name the moons of Jupiter, the "Medicean Stars" after Cosimo II de Medici, Tuscany's Grand Duke, and dedicated his first book, the *Starry Messenger*, to the same nobleman. Finally, in 1610, Cosimo appointed him "First Mathematician of the University of Pisa, and First Mathematician and Philosopher to the Grand Duke." He maintained this post while living in Florence throughout most of his period of troubles with the Church authorities.⁹

Much of the dispute between Galileo and the Church has been attributed to an innate conflict between science and religion. Galileo has even been referred to as a martyr for science.¹⁰ The assertions are false. Neither are science and religion opposed-although their methods may differ, their objects are in agreement-nor was Galileo condemned because of a statement of scientific truth. In reality, central to this conflict was the messenger, not the message.

We have seen the meteoric rise of a brilliant man, but we have not seen the man. Galileo's personality was a breeding ground for discord. According to Arthur Koestler, "Galileo had a rare gift of provoking enmity; not the affection alternating with rage which Tycho [Brahe] aroused, but the cold, unrelenting hostility which genius plus arrogance minus humility creates among mediocrities."¹¹ He was brash, abrasive, proud, and provocative. In his first post at Pisa, he had already earned the moniker "The Wrangler" due to "his choleric and disputatious temper."¹² Besides the run-in concerning heliocentrism, he disputed with varying degrees of success the so-called Aristotelians at the university concerning physics and astronomy, fellow astronomers concerning who discovered what heavenly things first, others concerning the composition of comets, and many others about whatever he could find. But it was not just that he engaged in frequent debate-that would be expected in the inquisitive atmosphere of the late Renaissance-but in the mode of his attacks. Galileo was a tremendously effective writer and rhetorician, who played his audience masterfully. His pen soaked in sarcasm, he refused to concede even the most minute of points, but chose to attack fiercely those with whom he disagreed. According to Will and Ariel Durant:

He was an ardent controversialist, skilled to spear a foe on a phrase or roast him with burning indignation. In the margin of a book by the Jesuit Antonio Rocco defending the Ptolemaic astronomy, Galileo wrote, "Ignoramus, elephant, fool, dunce...eunuch."¹³

J.L. Heilbron suggests that indeed "Galileo posed a special threat to the Church because he knew how to write. Witty, sarcastic, informative, and profound, he occupies a place among the stylists of Italian literature."¹⁴ And indeed to the Italian language he occasionally turned. Instead of writing in Latin, the universal language of scholars, and with an eye toward a larger, less exclusively educated crowd, Galileo penned his most controversial works in Italian. He was a popular polemicist quick to admit that he did not write for pedants.¹⁵ Consequently, instead of a simple essay swamped in figures and equations, he textured his

prose with wit and invective and aroused the passions of the multitudes. In short, Galileo would be a dangerous man with a delicate message.

Context Part II: HISTORICAL Action and Reaction

Galileo lived in an age of upheaval. He was born in the era during which the Protestant Revolution, shaking and shattering Christendom, reached a mature state. In 1642 he died, a month shy of his 78th birthday, after the Catholic Church had re-asserted herself and the sanguinary Thirty Years' War still had six years to go. These were the latter years of the Renaissance, and the beginning of what is sometimes referred to as the "Age of Reason."¹⁶ New worlds were opening up as explorers, traders, and settlers scattered around the globe and nations sought empires in exotic lands. It has been justly characterized as the "Age of Adventure,"¹⁷ for adventures are denned by uncertainty and excitement. And these are the things that unseated the Catholic order that had reigned supreme in the High Middle Ages.

Picture Three Systems

But the uncertainty and excitement proved perilous. For in their midst, souls were being lost. The Renaissance gave rise to many great advances in the arts and sciences, but its humanism also served as a distraction for many away from their heavenly goal. The Protestant Revolution, beginning in the early 16th century, not only upset the established social order, obliterated the unity of Faith, and brought about bloody insurrections and warfare, but it destroyed souls in countless quantity. The Catholic Church, whose Divine mission was to see to the salvation of those souls, was compelled to react. She did so impressively. The 1500s witnessed: the all-encompassing Council of Trent, which had so clearly denned so many things Catholic, and condemned so many things Protestant; the Catholic Reformation, where the Church cleaned house; the inception of the Jesuits, the most rigorously intellectual order of the day and stout defenders of orthodoxy; the codification of the Mass by Pope St. Pius V; a deluge of catechetical works; an unparalleled emphasis on apologetics, most importantly and epically by St. Robert Bellarmine; and a more resolute protection of the Sacred Scriptures that had been so savagely attacked by Protestantism. In sum, the Church tightened her grip on her divine possessions. She kept much stricter vigil over her dogmas, her Gospels, her sacred authority, all of which had been questioned by the "Reformers." Moreover, she maintained the Holy Inquisition and added, in 1559, the Index of Forbidden Books as means of pursuing her resolve to shepherd as many souls as possible to Heaven. Simply put, circumstances were poor for the promotion of ideas that could possibly detract from the authority of the Church or scandalize souls.

Context Part III: COSMOLOGICAL Three Systems

Onto a stage thus set, Galileo brought his pugnacious style to a debate that at the onset of the 17th century actually involved three competing theories of the universe. Two of these were geocentric and the third was heliocentric. In their details none of them were wholly true, but each seemed to supply an explanation for what was visible to the naked eye. In so doing, each was plagued by a dizzying number of epicycles, or circles upon circles, that were needed to reconcile the theory with what was clearly visible in the heavens. This effort to make what was apparent agree with a theory by postulating various speculative additions was called "saving the appearances." It was bulky and complex, but saving the appearances at least made the workings of the universe predictable if not actually comprehensible.

The most ancient view, and one that held sway for centuries was a mixture of the observations and speculations of Aristotle and Ptolemy. Known as the Ptolemaic model of the universe, this theory gained great esteem especially in the first half of the second millennium AD when Aristotle reigned supreme among philosophers and theologians. Aristotle had been reintroduced to the western world in the 1200s by the great scientist and theologian St. Albert the Great. However, where Albert sought proof and, when necessary, correction of Aristotle's claims through experimentation, later scholars tended to merely take "The Philosopher" at his word.¹⁸ In this case, the word of Aristotle, adapted by Ptolemy, proclaimed a universe with all of the celestial bodies moving in perfect circles around a stationary earth. But it was not just on the basis of Aristotle's authority that people accepted this model. In fact, as James Brodrick writes:

It answered well enough to their daily experience. The earth certainly seemed at rest, and any man who sat up late at night could see for himself the majestic wheeling of the heavens. The Scriptures, the revealed word of God, seemed to be permeated through and through with the same idea, though the sacred writers had never heard of Aristotle. The Fathers of the Church did not so much believe the geocentric theory as take it for granted. Ptolemy's elaboration of Aristotle did in fact account for the celestial phenomena well enough, and by it eclipses could be predicted and ships guided to their destinations with reasonable accuracy.¹⁹

Thus, the geocentric model of the universe, which was hardly questioned for eighteen hundred years seemed satisfactory not only on a philosophic and theological level, but also on a practical, common-sense level.

Canon Nicholas Copernicus, saw things otherwise. Looking to a number of ancient writers in combination with his own observations and those especially of Cardinal Nicholas Cusa and others in the fifteenth and sixteenth centuries, he devised a comprehensive theory that accounted for the appearances while

positing that the sun was the center of the universe. The Copernican model of the universe found its greatest exposition in his work, *De Revolutionibus orbium coelorum*, which was published while Copernicus lay on his deathbed in 1543. This model was known in most scholarly circles, taught as a theory in the universities, and believed by some, but for the most part it aroused little interest for about fifty years. The book itself "was and is an all-time worst seller."²⁰ While the general idea of heliocentrism was reputable, Copernicus's system was even more complex than the old one, containing more circles upon circles, and it was ensconced in a book that was almost as unreadable as it was unread. Meanwhile, the theory as Copernicus had it figured was so weak that he was actually afraid to publish it for fear of public embarrassment.²¹ Almost in spite of it all, the heliocentric theory would rocket back into prominence shortly after the turn of the 17th century.

The last system to vie for acceptance in this time period was that of Tycho Brahe. Tycho, who was arguably the greatest, most persistent and accurate celestial observer, opposed the Ptolemaic model because he could not reconcile it with the supernova of 1572 and the great comet of 1577. He also opposed the Copernican theory because of insufficient evidence, and because he felt it contradicted Scripture.²² In this last he followed the lead of his Lutheran forerunners, Martin Luther and Melancthon. To fill the void, he suggested a model wherein the sun and moon circled around the earth while the planets revolved around the sun in epicycles. A latecomer to the scene, this theory would gain greater acceptance, especially among the Jesuit astronomers, as new discoveries made the old Ptolemaic scheme appear less tenable.

Galileo Ascendant

In 1608 Hans Lippershey, a Dutchman, patented the telescope. A year later Galileo began work on his own, and by 1609 his "spyglass" was magnifying objects a thousand times. The calm ended. The tempest erupted. Immediately the heavens presented new spectacles to the aided eye and new evidence for the astronomical debate. As it turned out, the evidence proved devastating to the Aristotelian-Ptolemaic cosmology. Contrary to that theory, Galileo observed that the moon's surface was not perfectly round and smooth, but "full of irregularities, uneven, full of protuberances ... varied everywhere by lofty mountains and deep valleys,"²³ concluding that it was of the same material as the earth. He identified four moons that revolved around Jupiter instead of the earth, as well as the phases of Venus, the lack of proof of which had previously been a sticking point in the Copernican model. A year after the publication of these discoveries, he observed, with others, the sunspots, indicating that the sun was of changeable matter, again contrary to the model suggested by Aristotle. In sum, the empirical evidence provided by the telescope clearly mitigated against the

Ptolemaic theory of the universe that had been held so dear so long.

Galileo published his initial observations in a small book called the *Starry Messenger* in 1610. Twenty-four pages long, its message was highly accessible, and consequently sold out rapidly. The effect was dramatic. The cosmological debate spread like wildfire. Galileo was "lauded as the greatest astronomer of the age."²⁴ While this was certainly an overstatement, it indicates the spirit of the day. Meanwhile, Fr. Christopher Clavius, the highly renowned chief mathematician and astronomer at the elite Jesuit *Collegia Romano*, whom Galileo had met years before, wrote to tell him that the astronomers at the college had confirmed his discoveries. (Clavius would die just over a year later convinced in part because of the telescopic discoveries that the Ptolemaic system had become untenable.) So Galileo set out for Rome with high expectations of convincing the ecclesiastics there of the virtues of the Copernican system.²⁵ The Jesuits, many high ranking prelates and cardinals, and even the Pope, Paul V, who granted him a long audience, greeted him enthusiastically. He was admitted to the newly-formed *Accademia del Lincei* whose common goal was to "fight Aristotelianism all the way."²⁶ Writing, "Everybody is showing me wonderful kindness, especially the Jesuit Fathers,"²⁷ he returned to Florence in triumph.

Galileo's Obstacles

Galileo now proceeded to work at full throttle to gain acceptance of the heliocentric universe not as a theory, but as a proved fact. But while his confidence increased so too did the rumblings of dissent. In fact, the first condemnation of heliocentrism by the Inquisition was less than five years off.

Four serious problems plagued the Italian astronomer: **1)** First of all, and most importantly, he neither at this point, nor ever proved his theory. He eventually offered numerous arguments, but they were all flawed. In the meantime, he refused, possibly out of pride, to accept or even acknowledge Johann Kepler's idea that the planets' orbits are elliptical. If he had done so, his arguments would have been far more palatable for having gained the one thing lacking in all other models, namely simplicity (since the ellipses would eliminate the cumbersome epicycles). But, in spite of his various shortcomings, he clearly illustrated the weakness of the Ptolemaic model of the universe. However, this brings us to the second problem. **2)** Galileo never gave the Tychonic model sufficient attention. He could have completely annihilated the theory of Aristotle and Ptolemy, but since that was not the only geocentric alternative, it would still be far from logical to conclude that heliocentrism must be true. But this is exactly what Galileo did, as though Tycho Brahe and his ideas never existed. In the meantime, many of the Jesuit astronomers were taking to the Tychonic model precisely because it could still account for the various new telescopic discoveries just as well as heliocentrism, but it did not pose the Scriptural difficulties inherent in the

sun-centered theory. 3) The third problem facing Galileo then was the simple fact that his theory seemed to fly blatantly in the face of passages in Sacred Scripture such as Jos. 10:12-13, where Joshua commands the sun to be still in the valley of Ajalon. Not only were statements like this in Scripture, but the Church Fathers took them literally. As a result, an ancient teaching of the Church appeared to be contradicted by heliocentrism. 4) The last major problem standing before Galileo was his own personality. By championing the cause of heliocentrism, he was treading on potentially perilous ground. Copernicus and others had gotten away with discussing heliocentrism as a theoretical construction,²⁸ by promoting it as true, Galileo was taking the game to a whole new level. His disputatious nature would impede his progress throughout the pending ordeal.

The showdown between Galileo and the Inquisition took part in two phases. The first occurred in 1615-1616, the second 1632-1633. We will examine them in chronological order.

The First Showdown

By 1615, Galileo had spent years loudly preaching the Copernican theory as truth. He had defeated many a foe in mathematical debate, but in time the focus of the debate shifted from mathematics and astronomy to theology. The transition to the theological only occurred because Galileo insisted that Copernicanism was true, and not merely a hypothetical but practical tool. Indeed, using heliocentrism as a convenient construct to predict astronomical events and to save the appearances was one thing, but to suggest it was actually true in the face of and contrary to the authority of Sacred Writ was another.

Inevitably, the scriptural objections noted above were raised both by clerics and laymen, most importantly, the Grand Duchess Christina of Tuscany. In 1613, at a dinner in which the conversation turned toward the subject of the day, she inquired in some detail about the Copernican model and gave voice to the usual scriptural protestations to a disciple of Galileo's, a Benedictine monk name Benedetto Castelli. Castelli related the incident to Galileo, and Galileo took the plunge into the dangerous waters of theology. He hurriedly wrote and circulated his *Letter to Castelli*. It would prove to be the beginning of his downfall. In the *Letter* Galileo made clear his position that the Bible sometimes speaks of things according to common parlance, even if the speech is not technically accurate. (Thus, we still speak of the sun rising and setting even if we know that the earth's rotation accounts for the appearance of the motion of the sun.) Scripture was not intended as a mathematics textbook, and so should not be utilized as an authority in that field when observation seemed to contradict it. In this vein of thought originated the saying that the Bible was meant to teach how to go to

Heaven, not how the heavens go.

Within about a year of the circulation of the *Letter to Castelli*, the attacks on Galileo moved to the pulpit and then beyond. A Dominican, Fr. Thomas Caccini, attacked mathematics, mathematicians, and the Copernican theory mercilessly, using as his text for a sermon, "Ye men of Galilee, why stand ye gazing up into the heavens?" Fr. Niccolo Lorini, on behalf of the Dominican monks of St. Mark's in Florence, sent the *Letter* to Paolo Cardinal Sfrondato, one of the Inquisitors General, who in turn passed it on to the Holy Office. In the cover letter, Fr. Lorini stated the monks' opinion that the *Letter* slighted Scripture, the ancient Fathers, St. Thomas Aquinas, and the philosophy of Aristotle "which has been of such service to Scholastic theology."²⁹ Moreover, the monks could see that allowing individual interpretation of Scripture contrary to the teachings of the Fathers was precisely the origin of the Protestant Revolution and was condemned by the Council of Trent (1545-1563).³⁰

Aside from their place in the narrative, the interesting point about these two episodes is that in both cases, the higher Church authorities decreed in Galileo's favor. Fr. Luigi Maraffi, Preacher General of the Dominican Order apologized to Galileo for the attack by Fr. Caccini to which he referred as an "idiocy." The Inquisitor assigned to read the *Letter to Castelli* determined it to be orthodox.

As Galileo was gaining these two concessions, however, he was at work on a revised version of the *Letter*. In the interim between the two *Letters* he had been warned by friends (including the future Pope Urban VIII, Cardinal Maffeo Barberini) to cease the promotion of his theory as a fact, and to quit dabbling in theology and speak as a mathematician only. He refused this advice, emboldened by the publication of a book by a Carmelite Friar named Paolo Antonio Foscarini that claimed to have reconciled Copernicanism and Scripture. But Cardinal St. Robert Bellarmine, in review of Foscarini's work and referring explicitly to Galileo as well as Foscarini, said they must treat the matter as a theory and that Scripture was not to be reinterpreted unless and until there was "a true demonstration that the sun was in the center of the universe and the earth in third sphere, and that the sun did not travel around the earth..."³¹ Even at that point, Bellarmine said, it would be necessary to proceed with great caution in the reinterpretation of the difficult passages. After all, the faith of souls was at stake. On the part of Bellarmine, speaking, as all knew, unofficially for the Church, the thrust of his statement was judicious and prudent. It allowed that geocentrism was not an article of faith, thus leaving open the possibility that it might be shown to be false. On the other hand, he made clear that it was not a matter to be treated lightly, and that if heliocentrism were indeed demonstrably true it had to be dealt with delicately.

But the reckless Galileo, true to form, would not compromise. He believed Copernicus to be right, but he could not prove it. He wanted others to believe the same, but he could not convince them. And he hardly acknowledged the

Tychonic model, the one system that stood as an entirely logical alternative. Nevertheless, in his *Letter to the Grand Duchess Christina*, the revision of that to Castelli, he disregarded all exhortations for prudence and a tempered message. After repeating and magnifying all of his controversial methodological practices of the past (e.g. interpreting Scripture, asserting the reality of Copernicanism), he went so far as to suggest that his theory must be accepted as truth until the theologians had disproved it. In other words, the Bible must be reinterpreted unless the theologians could disprove heliocentrism. In this manner he appeared to shift the burden of proof to the theologians.³² It was a bold move and a hazardous decision. In spite of the apparent rebelliousness of his approach, however, he concluded by promising submission to the Church and her judgment on matters concerning religion. And yet he added, "I do not feel obliged to believe that that same God who has endowed us with sense, reason, and intellect has intended us to forgo their use."³³

Picture

In December, 1615, against the advice of many of his cardinal friends and Robert Bellarmine, Galileo took his case to Rome. Rumors had spread that Copernicanism was to be banned by the Church authorities. In order to thwart a decision against Copernicus and to clear his own name, Galileo stepped into the gauntlet.³⁴ Amidst murmurs of heresy and blasphemy, he pleaded his case before everyone in the ecclesiastical hierarchy who would listen. In February of 1616, as passions flew, he pressed the issue to a climax by proclaiming that he had the evidence he needed to prove the Copernican theory once and for all. The time, he judged,³⁵ was opportune to convert the Pope to his ideas. Through the young (22 years) Cardinal Orsini, he presented his theory that the tides were caused by the revolution and rotation of the earth to Pope Paul V.³⁶ The move was a serious miscalculation. Instead of being convinced, the pope became alarmed by the escalating controversy. His hand forced thereby, he summoned the theological consultors of the Holy Office on February 19, 1616, and asked for a decision on the issue of the day.

The Sacred Congregation of the Holy Office of the Inquisition made their decision on February 23, 1616. The eleven consultors on the committee unanimously declared that the proposition that the earth revolves around the sun was foolish, absurd, and "formally heretical."³⁷ When the official decree was released by the Congregation of the Index, however, the word heresy was eliminated. Galileo was not mentioned in the decree, but Copernicus's book was placed on the Index of Forbidden Books pending correction and Foscarini's book was banned outright. Nine lines indicating that heliocentrism was merely a theory made Copernicus's book acceptable, and it was removed from the Index within four years. Foscarini was dealt with more harshly because he tried to reconcile Sacred Scripture with heliocentrism. As Galileo put it himself, "They have forbidden only such books as professionally attempt to sustain [the Copernican theory] with the Bible."³⁸ Since Galileo had published little that

dealt with heliocentrism directly,³⁹ he escaped prohibition. However, pursuant to a directive of the pope, Cardinal Bellarmine ordered him not to hold or defend the Copernican model as true. Galileo, the good Catholic that he was, readily accepted his fate. When his detractors used the opportunity to claim that Galileo had recanted his theory, he requested and received from the same illustrious Cardinal an important letter refuting them. Meanwhile, Pope Paul V assured him in person that he would all but ignore any new rumors or calumnies that were reported against the mathematician.

At the conclusion of this episode in Rome, things stood in the main as they had prior thereto. Heliocentrism could still be considered as a mathematical means of saving the appearances, but only as a theory. The big difference was that now the matter had been settled by the Inquisition and to act contrarily would be to breach their decision. On Galileo's shoulders did the responsibility rest especially for adhering to this decision since Bellarmine addressed him in particular. As the excitement died down, many breathed a sigh of relief.

And yet, the earth moves! From what we have seen, it appears that those who hate the Church are right. The myth is true. The Church officially condemned a true statement. Or did she? In fact, the Church did not. Not only does the decision of the Inquisition not represent the official, irrevocable position of the Church, but when it was presented to the pope he only approved it in a manner that did not invoke infallibility. Let us look to Hilaire Belloc for the instant analysis:

[The condemnation] proceeded from a particular disciplinary organ of the Catholic Church, with no authority whatsoever for finally establishing a point of doctrine. To confuse it with Catholic definition of doctrine would be like confusing the definition of a New York court of justice with an amendment to the Constitution....There was no definition binding upon Christians, and has been none, nor ever will be in such a purely mechanical affair.⁴⁰

Had the Inquisition made a mistake in declaring heliocentrism heretical? Yes. Did the Church err? Absolutely not. In fact, where the Holy Ghost played a role was in seeing to it precisely that the Church did not at this time make the error of stamping the decision of the Holy Office with her infallible approval.

The Second Showdown

And then, all was silent. But not for long. In 1618 three comets appeared in the sky leading to debate between Galileo and the Jesuits. That year also saw the onset of the Thirty Years' War. The two clashes would play heavily into the second part of Galileo's run-in with the Church.

The appearance of the comets led to a fiery literary exchange between Galileo and the leading Jesuit astronomers and mathematicians concerning the nature of comets. Though each party accented its arguments with piercing personal slights, Galileo's "cyanide-saturated passages,"⁴¹ resulted in the alienation of many of his key Jesuit allies in the heliocentrism debate. He further agitated others with his virtual rejection of all authority besides observation, reason, and experiment. To many it became clear that he was entirely redefining the relation of Science and Philosophy in a highly heterodox fashion. Galileo's major contributions to this debate came in the form of an essay published under the "authorship" of his disciple Mario Guiducci, and a book entitled *Il Saggiatore-translated, The Assayer*.

The Assayer was published in 1623 with an air of euphoria, for it seemed the tide had turned in Galileo's favor. The book itself was dedicated to the new pope and had on its frontispiece the Holy Father's coat of arms. And the new pope, elected in conclave on August 6, 1623, was none other than Urban VIII, the former Maffeo Barberini, Galileo's long-time friend and supporter. Barberini had opposed the decision of 1616 and had even written a poem in Galileo's honor in 1620. As pope, his affection for and appreciation of Galileo manifested themselves in conversations with Galileo's friends in Rome and eventually in six private audiences with the mathematician himself in 1624. The pope showered Galileo with gifts including medals of gold and silver and a pension for his son. In addition, he praised the mathematician to the point that Galileo was referred to as Urban's "beloved son."⁴² Although he could not get Urban to revoke the decision of 1616, Galileo went away with the impression that he had license to write anything about heliocentrism as long as he admitted that it was not the only possibility. Following this happy trend, he could hardly have been more pleased when in 1626 Benedetto Castelli was appointed mathematician to the pope and another disciple, Fr. Niccolo Riccardi, was named Master of the Sacred Palace. As such, Riccardi was the chief censor of the press in Rome. In the meantime, reviews by the Holy Office of *The Assayer* and by other Church authorities of Galileo's 1625 *Letter to Ingoli* came out in his favor and seemed to indicate that the Copernicanism debate could be safely resurrected. Amidst all of these developments, Galileo's friends pressed him to pen the book that would finally establish Copernicanism as true, once and for all.

In February, 1632 the *Dialogue Concerning the Two Chief World Systems* emerged from the printer to an enthralled public. Galileo's final gamble on behalf of Copernicanism came complete with the imprimatur of Fr. Riccardi. To give the appearance of meeting the restrictions placed upon him, Galileo installed a preface and a conclusion that seemed to indicate that the debate was undecided. In stentorian fashion, however, the rest of the text of the *Dialogue* belied the opposite and true conclusion of the author.⁴³ The book was written as a Socratic dialogue carried on over the course of four days among three men. Salviati represents Galileo's position, Simplicio is the spokesperson for the Ptolemaic-Aristotelian cosmology, and Sagredo is generally impartial.

(Significantly, no one represents the Tychonic model, and it is completely disregarded yet again. The decision to ignore the stronger geocentric argument of Tycho made it appear all the more like Galileo was trying to prove heliocentrism as a fact.) In the course of their discussions, Salviati shines resplendent in his attacks on the Ptolemaic model. Simplicio is a dolt. And yet into the mouth of the dolt, "with almost incredible imprudence,"⁴⁴ Galileo places the words of Pope Urban VIII. Before the highly sophisticated arguments of the genius Salviati, Galileo, purposely or not,⁴⁵ makes a mockery of not just geocentrism, but the Pope himself.

Urban felt betrayed. He had coddled and praised and celebrated the man only to be repaid with treachery. But that was not all. At the time of the publication of the *Dialogue*, the Protestant forces led by Gustavus Adolphus of Sweden were winning massive victories and ravaging Catholic nations in the ongoing Thirty Years' War. The pope had supported Cardinal Richelieu of France who in turn had aided Adolphus. To some, the pope's support of heretics appeared manifest. It is certainly conceivable, as some argue,⁴⁶ that he perceived the Galileo situation as an opportunity to prove these appearances false. In the meantime, a group of Jesuits, the astronomers of which were again poked at in the *Dialogue*, pressed for the banning of the book on the basis that it clearly disobeyed the decree of the Inquisition in 1616.

By August of 1632 the publication of the book had been suspended. A commission originated by Urban brought up three main charges against Galileo in September, and he was summoned to Rome a few weeks later. Perhaps the most grievous accusation, because most obviously true, was one that stated that Galileo had been silent about and defied a 1616 injunction that required him not "to hold, teach, or defend [his Copernican notions] *in any way, verbally or in writing*" (my italics). This injunction contradicted the one given by Bellarmine at the same time as well as the assurances of Popes Paul V and Urban VIII. It undoubtedly surprised Urban as much as it did Galileo later on. But there it was in the files, albeit unsigned, dated the day after Bellarmine's instruction to admonish Galileo in the terms stated above. And there could be no question that Galileo had violated it, since according to the injunction he was restricted from even treating Copernicanism as a *theory* let alone a reality. But was the injunction genuine? Galileo knew nothing of it; Bellarmine was dead now and could not speak to it; none of the others who would know of it were around to say. For the past century and a half it has been the source of a raging controversy within the already volatile Galileo debate. Some say it is a forgery, others a conspiracy, some both; others claim it was a mistake corrected by Bellarmine later on. Whatever the case, the document is highly suspicious and almost seems like it must be a fictional twist to an intriguing drama. Nevertheless, on the weight of this document especially Galileo was brought to trial.

After delaying the inevitable as much as possible, Galileo arrived in Rome in February of 1633. He was eventually moved to the Palace of the Holy Office

where he was given a five-room suite and a servant as well as allowed "a major domo to look after his food and wine."⁴⁷ It was far from the prison cell described in many a myth. In fact, a month later, in the midst of the trial Galileo was actually released from his quarters at the Holy Office and allowed to resume a place at the Tuscan Embassy in Rome.

Galileo's trial before the Holy Inquisition began on April 12, 1633, when he had his first hearing. The last of four hearings occurred two months later on June 21, 1633. In the course of the trial, Galileo produced in his defense the certificate provided him by Bellarmine that said that he was not required to abjure any of his beliefs. Meanwhile, he admitted only that he was barred from treating Copernicanism as a proven fact, denying any knowledge of the spurious document of February 26, 1616, or its more stringent restrictions. At first, he rejected the accusation that he weighted his arguments in the *Dialogue* heavily in favor of Copernicanism, but later, in the face of the obvious truth, he retracted and offered to republish his book with an addendum that would balance the arguments more evenly. Throughout the trial he adamantly refused to admit that he actually held to heliocentrism himself, claiming that he abandoned the notion ever since the decree of the Index of March 5, 1616. The Inquisitors knew that he was lying, and had a long list of quotes to prove it. At the behest of the pope, and after having given Galileo numerous chances to confess to his true position, on the last day of trial he was threatened with torture if he did not report his true convictions.⁴⁸ He emphatically declined, stating that since the decree of 1616, "every doubt vanished from my mind, and I held and still hold Ptolemy's opinion-that the earth is motionless and the sun moves-as absolutely true and incontestable."⁴⁹ Instead of confronting him with their laundry list of quotes, the Inquisitors sent Galileo away. The trial was over, the verdict clear; all that remained was the sentencing.

On June 22 the Holy Office handed down the sentence:

We say, pronounce, sentence, and declare that you, the said Galileo...have rendered yourself in the judgment of this Holy Office vehemently suspected of heresy, namely of having believed and held the doctrine-which is false and contrary to the sacred and divine Scriptures-that the Sun is the center of the world and does not move from east to west and that the Earth moves and is not the center of the world; and that an opinion may be held and defended as probable after it has been declared and defined to be contrary to the Holy Scripture.... [we] ordain that the book of the "Dialogue of Galileo Galilei" be prohibited by public edict.... [We] condemn you to the formal prison of this Holy Office during our pleasure, and by way of salutary penance we enjoin that for three years to come you repeat once a week the seven penitential Psalms.⁵⁰

Only seven of the ten cardinal-judges signed the sentence. The reasons for the three abstentions are not clear, but it is likely that at least Francesco Cardinal Barberini (the pope's nephew) refused because he felt the sentence too rigid.

Nevertheless, Galileo formally abjured in the manner quoted at the beginning of this article. Before he did so, however, he had eliminated from the form of abjuration a reference to connivance on his part regarding the *Imprimatur* and, more importantly, a statement that indicated he was not a good Catholic.

Shortly after the close of the trial, Galileo's sentence was commuted. His daughter, a Carmelite nun, recited the penitential Psalms in his place. A week after the trial, he was released into the custody of the Archbishop of Siena, a friend of his, who provided him with the run of his palace and use of his staff. At the end of the year, he moved back to his country estate near Florence. Later, he would move to the city of Florence. All the while, he entertained visitors and continued his work-in spite of having lost his eyesight-finally writing and publishing his masterpiece, *Discourses concerning Two New Sciences* in 1638. On January 8, 1642, Galileo died, with the last sacraments, in the bosom of the Church he so dearly loved.

Conclusion and Analysis

Pope John Paul II set up a commission to review the Galileo affair shortly after his accession to the throne of Peter in the late 1970s. When their findings were finally approved by the pope in 1992 they stated to the chagrin of folks on both sides of the issue that while Galileo appeared to have been mistreated, blame must be laid on the shoulders of Galileo as well as the Church authorities. Without analyzing those findings in detail, it is fair to say that this general conclusion seems to be accurate. If we take events as a whole and in context, we find the following:

Galileo was a horrible messenger with a sensitive message delivered in the most destructive manner at the worst possible time. Due to the maladies brought on by the Protestant Revolution and the Renaissance, the Church was compelled into a rigid orthodoxy. With the Church thus poised, Galileo, by dallying in theological speculation contrary to ecclesiastical admonition, forced an unnecessary showdown that put the faith of souls in peril. But it was not Galileo's place to endanger them, especially with a theory for which he had no proof. In the interest of saving souls and quieting a potentially rupturing debate, the Inquisition stepped in in 1616 to quell the harangue. The Holy Office did not condemn a statement that had been proved; it merely required it to be called exactly what it was, a hypothesis. Galileo agreed to these terms. With the publication of the *Dialogue*, however, he clearly overstepped these bounds. In the meantime, his polemics alienated the most important allies he could ever have, namely Pope Urban VIII and the leading Jesuit astronomers from the *Collegia Romano*, thus clearing the way of all obstacles to a showdown with the Inquisition. His trial of 1633 was a disciplinary one that condemned him for disobeying the mandates of the decree of 1616, a charge which was manifestly

true.

On the other hand, Galileo was right about heliocentrism. Moreover, some of his theological wanderings eventually found themselves mirrored in several papal encyclicals of the last two centuries. *Providentissimus Dem* by Leo XIII and *Humani Generis* by Pius XII, for instance, both have pieces that could have been extracted from Galileo's *Letter to the Grand Duchess Christina*. As Frederick Copleston well noted:

Galileo made some sensible remarks about the interpretation of the Scriptures, the truth of which is recognized today and might well have been recognized more clearly by the theologians involved in the case. But the fault was by no means all on one side. In regard to the status of scientific theories Bellarmine's judgment was better than Galileo's, even though the latter was a great scientist and the former was not.⁵¹

In the long run then (though we cannot extract the theological opinions of Bellarmine and others from their context), Galileo seems to have won out both on theological as well as scientific grounds. If he had been less strident and more patient in his demands for ecclesiastical recognition of something he could not prove, and more sensitive to the prudent decisions of the Church authorities who had much higher objectives in mind, perhaps he could have seen the whole affair through to a happy conclusion. Instead, he forced his own downfall.

In Galileo's defense, one could argue that certain Churchmen acted disreputably during this affair. Motivated by wounded pride, Pope Urban VIII certainly exaggerated when he referred to the whole thing as the worst scandal in the History of the Church. This in the midst of the Thirty Years' War and hot on the heels of the Protestant Revolution, the Western Schism and the abuses of the Renaissance Era?!

But what does this say of the Church's claim of infallibility? As we have seen, at no point did the Church ever claim infallibly that geocentrism was true, or heliocentrism false. The Inquisition was an astute body, but it was not the Church. The pope never approved the decisions of the Holy Office in an infallible manner. In fact, it was with forethought that in each case the reigning Pontiff only approved them in a general, and thus not infallible, way.

As for the relation of the Catholic Church and Science, this episode cannot be held as evidence of any antagonism. As we have seen, Galileo was not condemned for his scientific dalliances, but for disobedience. For his depiction of the heliocentric proposition as fact instead of hypothesis he was called suspect of heresy, but by no means a heretic. Between the two is an infinite gulf. In the meantime, the Church fears not scientific truths. The same God who founded the Church, made the world, and the study of His creation is obviously something the Church smiles upon. In this particular case, just as Catholics could study

heliocentrism before Galileo's condemnation, they continued to do so afterward. And as Arthur Koestler points out, already by the late 1600s the Jesuits were teaching Copernican astronomy in their eastern mission lands.⁵² It would not be entirely frivolous to ask if this was more a result of or in spite of Galileo Galilei.

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1. George de Santillana, *The Crime of Galileo* (New York: Time Inc., 1962), p.337.

2. Quoted in *Providentissimm Deus*, in *The Great Encyclical Letters of Leo XIII* (Rockford, IL: TAN Books and Publishers, 1995), p.294.

3. *Ibid.*, p.335.

4. *Ibid.*, p.338.

5. All of these claims have been made in more or less scholarly works. One fine and easily accessible example of Galileo myth-making is the movie short *Galileo: On the Shoulders of Giants* (Devine Entertainment, 1997). Though by no means a complex work, this Emmy Award-winning piece amplifies many of the more prominent lies about the affair up through the first trial. Found in many public libraries and schools, the movie is meant for the young, but indeed it is during youth that so many of our prejudices are formed that last for life.

6. There are some, including certain prominent traditional Catholic authors, who still maintain that the Earth is the center of the universe in spite of the preponderance of evidence to the contrary. Though it would appear impossible to state definitively where the center *actually* is, or that there is a center at all, given that everything seems to be in motion, to stand on geocentrism as an article of faith is irresponsible precisely because it is not an article of faith. To defend it as such, especially in light of the evidence, is theologically unsound and unnecessary, while serving no positive purpose. The Church has never defined geocentrism as a dogma binding on Catholics. Moreover, Pope Urban VIII himself said that heliocentrism would never be condemned as heretical. See Jerome J. Langford, *Galileo, Science and the Church*, 3rd ed. (Ann Arbor, MI: 1992), p. 113. That said, Robert Sungenis puts up a good fight for geocentrism

from a scientific standpoint as opposed to a theological one. See his website, www.catholicintl.com.

8. As absurd as this might sound, it is the solution of many people in many instances. Even the great Arab philosophers Averroes and Avicenna resorted to similar resolutions when their philosophical conclusions contradicted the teachings of the religion to which they subscribed, namely Islam.

8. Langford, *Galileo, Science and the Church*, p. 17; Galileo was also a generous man and devoted father. Although his three children were illegitimate offspring of his 17-year relation with a mistress, his two daughters became devout religious. He spent himself poor in support of them. See Dava Sobel, *Galileo's Daughter: A Drama of Science, Faith and Love* (Fourth Estate, 1999), for a great compilation of the letters from his daughter by which one can glean an idea of his end of the correspondence.

9. Will and Ariel Durant, *The Age of Reason Begins* (New York: Simon and Schuster, 1961), pp.601,604-605; Arthur Koestler, *The Sleepwalkers* (New York: Penguin Books, 1989), pp.359-360,376; James Brodrick, S.J. *Robert Bellarmine, Saint and Scholar* (Westminster, MD: The Newman Press, 1961), pp.337-339; Langford, *Galileo, Science and the Church*, pp. 17-22.

10. From the translator's preface by Stillman Drake in *Galileo Galilei, Dialogue Concerning the Two Chief World Systems* (New York, Modern Library, 2001), p.xxxiv.

11. Koestler, *The Sleepwalkers*, p.373.

12. Brodrick, *Robert Bellarmine, Saint and Scholar*, p.337.

13. Durant and Durant, *The Age of Reason Begins*, p.605.

14. From the introduction by J. L. Heilbron in *Galilei, Dialogue Concerning the Two Chief World Systems*, p.xx.

15. *Ibid*, p.xxxv.

16. See Durant and Durant, *The Age of Reason Begins*.

17. Langford, *Galileo, Science and the Church*, p. 1.

18. Fr. Christopher Rengers, O.F.M. Cap., *The 33 Doctors of the Church*, (Rockford, IL: TAN Books and Publishers, 2000), pp.322-325.

19. Brodrick, *Robert Bellarmine, Saint and Scholar*, p.335.

[20](#). Koestler, *The Sleepwalkers*, p. 194. Copernicus's work went through four editions in four hundred years. A thousand copies made up the first printing they never sold out.

[21](#). *Ibid.*, pp.194-198, 215-218.

[22](#). Langford, *Galileo, Science and the Church*, pp.46-47.

[23](#). Koestler, *The Sleepwalkers*, p.370.

[24](#). Durant and Durant, *The Age of Reason Begins*, p.603.

[25](#). Langford, *Galileo, Science and the Church*, p.45.

[26](#). De Santillana, *The Crime of Galileo*, p.21.

[27](#). Brodrick, *Robert Bellarmine, Saint and Scholar*, p.346.

[28](#). Although Copernicus believed heliocentrism to be true, a forged introduction by Osiander, his Lutheran assistant, to *De Revolutionibus* stated that it was only hypothetical. Copernicus, of course, was dead before he could change things.

[29](#). Quoted in Langford, *Galileo, Science and the Church*, p.57.

[30](#). See *Ibid.*, p.56 for the text of the decree of Trent.

[31](#). *Ibid.*,p.61.

[32](#). Koestler, *The Sleepwalkers*, pp.440-443; Langford thinks that Galileo did not intend it this way in spite of the fact that it reads so. It is difficult, though not necessarily impossible, to imagine that the great rhetorician would make such a grievous error as Langford suggests. See Langford, *Galileo, Science and the Church*, pp.77-78.

[33](#). Quoted in Durant and Durant, *The Age of Reason Begins*, p.607.

[34](#). Stillman Drake, *Discoveries and Opinions of Galileo* (New York: Anchor Books, 1957), pp.170, 285.

[35](#). Galileo's judgment here was contradicted by many of the Cardinals who knew better. He was headstrong and not to be dissuaded, and consequently provoked the clash that would undo him. See Koestler, *The Sleepwalkers*, pp.458-461.

[36](#). It is beyond the scope of this article to detail Galileo's theory of the tides. Simply put, it was wrong and accepted by few then and no one now. Kepler had

already determined that the tides were caused by the moon, but Galileo ignored Kepler here as he had with the elliptical orbits. *Ibid.*, p.460.

[37.](#) Brodrick, *Robert Bellarmine, Saint and Scholar*, p.372.

[38.](#) Drake, *Discoveries and Opinions of Galileo*, p.219.

[39.](#) He spoke only indirectly, and just once of heliocentrism in his *Starry Messenger*. The two *Letters*, though disseminated, had never been officially published.

[40.](#) Hilaire Belloc, *The Catholic Church and History* (Long Prairie, MN: The Neumann Press, 2001), pp.48-49.

[41.](#) Pietro Redondi, *Galileo Heretic* (Princeton, NJ Princeton University Press, 1987), p.49.

[42.](#) *Ibid.*,p.50.

[43.](#) Although no one has ever really doubted Galileo's true intentions for writing the *Dialogue*, he confirmed that he was trying to provide "a most ample confirmation of the Copernican system" in a letter written to a friend in 1629. See Langford, *Galileo, Science and the Church*, p.116.

[44.](#) Warren Carroll, *The Cleaving of Christendom* (Front Royal, VA: Christendom Press, 2000), p.538.

[45.](#) Galileo would claim to his death that he did nothing to intentionally insult Pope Urban VIII. See Koestler, *The Sleepwalkers*, p.491.

[46.](#) Carroll, *The Cleaving of Christendom*, p.538.

[47.](#) Koestler, *The Sleepwalkers*, p.498.

[48.](#) The threat of torture was a mere formality. The Inquisitors knew it and so did Galileo. He was not even shown the instruments of torture. The fact is, as a rule, people of Galileo's age (70 at the time) were not tortured by the Inquisition.

[49.](#) Durant and Durant, *The Age of Reason Begins*, p.610.

[50.](#) De Santillana, *The Crime of Galileo*, pp.335-336.

[51.](#) Frederick Copleston, S.J., *Late Medieval and Renaissance Philosophy*, p.286.

52. Koestler, *The Sleepwalkers*, p.503.

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