

## *Dialogue on Science, Ethics, and Religion*

### Summary

#### **Galileo and the Church: The myth and the reality**

**Rebecca Booker**

**November 13, 2003**

Many view the intersection of science and religion as rife with controversy and debate. The example of such controversy most often cited is that concerning Galileo and his trial by the Roman Catholic Church in 1633. This event has inspired many scholars, scientists and theologians to examine the relationship between science and religion, and the ramifications scientific discoveries can have for religious tradition.

Renowned Galileo scholar Annibale Fantoli examined the history of the trial of Galileo by the Catholic Church, and the consequences the trial has, even today, as a source for the “myth” of inherent opposition between science and religion. Dr. Fantoli delivered his lecture at the DoSER public lecture series on November 13, 2003. Dr. Fantoli holds a doctorate in Astronomy from the State University, “La Sapienza” in Rome and licentiate degrees in Philosophy and Theology from the Pontifical Gregorian University.

In an October 31, 1992 speech to the Pontifical Academy of Science, Pope John Paul II declared that the Galileo trial “has helped to anchor a number of scientists of good faith in the idea that there was an incompatibility between the spirit of science and its rules of research on one hand and the Church faith on the other.”

For two centuries the Catholic Church held the proceedings of the Galileo trial in secrecy, further fueling the view that the Galileo affair was a testament to the incompatibility of science and religion. It has been only since the second half of the nineteenth century that the Church has made available for study the documents describing the circumstances surrounding Galileo’s trial and conviction. These reveal a drama formed “not [by] a preconceived hostility to science, but a blind attachment to a certain type of science, coupled with a too narrow literalism and dogmatism, as well as an unwise authoritarianism.”

When Galileo first gazed into the night sky using a telescope far superior to any thus far developed, his observations provided the first concrete demonstration that the Earth was not the center of all celestial motions. He published a 57 page book of his observations, revealing stunning news about lunar mountains and perhaps seas, the composition of the Milky Way by myriad stars, and of satellites moving around Jupiter. His observations stood in direct contradiction to the Aristotelian cosmological tradition, which were at the foundation of the Catholic Church’s celestial teachings. Galileo’s book, *Sidereus Nuncius* (*Starry Messenger*), supported but did not confirm a theory long ignored by the Church, that the sun remained immobile, while planets rotated around it. The theory, penned by Copernicus based on an ancient Pythagorean heliocentric proposal, had been acknowledged as a useful mathematical system for calculating planetary motions, but was dismissed as absurd if argued to be a true account of actual celestial order.

With Galileo's discovery, the Church's affirmation of Aristotelian natural philosophy was challenged. At this time the Catholic Church was then in the midst of its Counterreformation, based on the decisions of the Council of Trent. In 1571, Pope Pius V created a Congregation of the Index to control all printed books. All books deemed heretical or dangerous for the faith were put in a published Index of the Forbidden Books.

Realizing that the *Sidereus Nuncius* might be included on the Index, and thus suppressed, Galileo wrote and publicized a letter to the Benedictine Domenico Castelli (?), stressing that the Holy Scriptures were not intended to teach astronomy or natural philosophy. However, the Council of Trent had adopted a position on the interpretation of scripture that restricted those with authority to do so. Thus, Galileo, was accused by some of private interpretation of the Holy Scripture. As attacks on Galileo within the Church mounted, Galileo visited Rome in 1616 to discuss the matter with Cardinal Bellarmine. Galileo was instructed that he was to "neither hold nor defend" the Copernican view. Should he fail to comply, Galileo would be prevented from all teaching and could face imprisonment.

Galileo agreed to comply. He returned to Florence, where he abstained from discussing Copernicanism for six years, until election of Cardinal Barberini, an admirer of Galileo's, as the new Pope, Urban VIII. Galileo returned to Rome to meet with the new Pope, where he obtained permission to write a book examining both the Aristotelian and Copernican theories in an impartial way. The book, *Dialogue Concerning the two Chief World Systems*, created uproar within the Church. It was determined to be a pro-Copernican work. Galileo was tried and found guilty of defending Copernicanism, and, upon recantation of those views, he was condemned to house arrest. He remained in that state until his death in 1642.

In the years following the death of Galileo, James Bradley provided indisputable proof of the Earth's motion about the sun, thus confirming empirically Copernican theory. Even prior to this demonstration, the acceptance of Copernican astronomy by natural philosophers throughout Europe, including some in predominately Catholic countries, presented the Church with the problem of acknowledging the new situation while the Decree of the Index was still in force. "Its abrogation would have been equivalent to the admission of an error in doctrinaire matters," Fantoli said. It was not until 1835 that Copernicus and Galileo's works, along with those of Kepler, were finally dropped from the Index of Forbidden books.

The Galileo affair has continued to be a thorn for the Catholic Church. However, the Galileo affair should be viewed as "not an opposition of religion to science as such, but an opposition between two different kinds of science," Fantoli said. It was on the basis of the Aristotelian science that the theologians of the Holy Office determined that Copernicanism was "false and absurd". Given the falsity and absurdity of the view, they felt sure that the opposition to Scripture, stated from a theological point of view, "was in full accordance with 'science' without the danger of future contrary proofs by the latter."

This logic by the Church, that if Aristotelian science was true, and was consistent with the witness of the Bible then Copernicanism must be false and thus blasphemous, does not reduce the Galileo affair to a simple confrontation between two different types of science, according to Fantoli. Although both Catholic and Protestant theologians preferred a literal interpretation of the Bible, the Galileo trial also represents “a bitter theological dispute concerning the hierarchical structure of the Church, and especially the existence and role of the Papacy.” Galileo’s publications were viewed as an affront to the Catholic Church itself and particularly Urban VIII, and not a mere scientific debate.

To Galileo, the debate about the motions of the Earth and sun were not matters of the Christian faith, but rather needed to be decided on purely scientific merit. The Church, however, felt that such matters were deeply intertwined with the faith. “The Galileo drama was therefore the almost unavoidable outcome of a mistaken trust towards a certain kind of science and its characteristics, on one hand, and of a too narrow literalist interpretation of the Bible, on the other.”

The popular myth, of Galileo sacrificing himself as a martyr for advancement of the Copernican theory, Fantoli holds, is false. “No doubt, Galileo has no little responsibility in the outcome of his drama,” he stated. “We cannot forget that Galileo was a believer in his Church and in its authority. That belief, much more than a simple attachment to life and to its simple pleasures, was the ultimate reason, I believe, why he could never have thought to die as a martyr of Copernican opinion.”

Responding to Fantoli’s lecture, J. Scott Hauger, Director, Science & Engineering Policy and Practice Group, American Association for the Advancement of Science provided a context for understanding the Galileo conflict as it is reflected in society today.

Dr. Hauger cautioned against evaluating the Galileo trial with modern-day standards of scientific objectivism. “We stand in danger of a perverse form of presentism or Whiggish history if we try to interpret the events of the seventeenth century in our own terms.” The lessons to be learned from the Galileo affair, an event which occurred some 200 years before the first occurrence of the word “science,” should be those that come from an examination of the social, intellectual, and political contexts within which scientists today must practice their research.

In the time of Galileo, Hauger said, mathematicians and natural philosophers were trained to be interpreters of nature. Theologians were trained to be interpreters of scripture. In the event of conflict between the two, the higher authority prevailed. In seventeenth century Italy, the authority of the Church exceeded the authority of the natural philosopher. “I would suggest that Galileo’s abjuration can be seen as an act of humility in the face of a contrary and powerful system of knowledge, not necessarily one of cowardice.”

In the present-day West, Hauger asserted, the power of the church has been usurped by the power of government. “It is clear that in the Western world, the scientific community generally exercises more interpretive authority regarding the book of nature than does any religious group.”

And yet, he added, “the epistemic authority of the scientific research community does not reign supreme.” In the twenty-first century, as in the seventeenth, political power is the ultimate arbitrator of conflict, and scientists are subjected to challenge when their work conflicts with the metaphysical commitments of other groups. The points of challenge have largely shifted over time from the fields of astronomy, cosmology, physics and the earth sciences, first to evolutionary biology, and then to the life sciences more generally, especially where they are concerned with human sexuality, human behavior and the place of human beings in the planetary ecology. “Very often, as in Galileo’s time, the conflict is between the book of nature as read by scientists, and the sacred scriptures, as read by theologians or individual believers.”

Although in the early twenty-first century such conflicts can be debated and resolved in forums that allow for consideration and review of evidence, “just as Galileo subordinated his knowledge to that of the Church, so must contemporary scientists accept and live within the laws of Congress, the rules of the executive branch, and the findings of the courts.”

The lesson to be learned from Galileo, Hauger concluded, is not to strive for a society that places scientific fact above universal ethics, nor is it to let science be governed by the rules and regulations of a political authority, but rather it is better to “seek mutual understanding and respect and a *modus vivendi* among knowledge communities than to strive for a short term and reversible victory for one knowledge community and one epistemic authority over another.”

“Such an approach recognizes the fallibility of all human knowledge. It recognizes the fact that as communities of human beings we lack direct access to the sources of epistemic authority, be they natural or metaphysical, so that all sources of epistemic authority are mediated by groups of human beings. It helps us avoid misplacing and defending our own conventional or metaphysical commitments in ways we may later come to regret. It creates a forum where there is no need for indictment nor abjuration. It promotes and guides us towards epistemic tolerance and understanding based on humility as well as awe in the face of nature and of nature’s author.”