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Research Article



A Para-clerical Approach to the Galileo Affair and to Science vs. Religion

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Abstract | In 1633, the Inquisition condemned Galileo for defending Copernicus's hypothesis of the earth's motion and denying the scientific authority of Scripture. This ended the original controversy, but generated a new one that continues today, for example, about whether the condemnation proves the incompatibility between science and religion. Recently the Galileo affair has been studied by several scholars whom I label "Berkeley para-clericals," chiefly philosopher Paul Feyerabend and historian John Heilbron. Their approach is distinctive: it views controversial topics involving the relationship between science and religion from a perspective that is secular-minded, but appreciative of religion, and yet conducted in the belief that such topics are too important to leave to religious believers. This approach also characterizes the work of other Berkeley para-clericals, such as Ronald Numbers on the controversy over creationism and evolutionism; they stress such attitudes as impartiality, judiciousness, and even-handedness.

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Introduction

The main aim of this essay is to call attention to the existence of a distinctive approach to the study of the Galileo affair, and more generally to questions of science vs. religion. Such an approach can be detected in the works of philosopher Paul Feyerabend and historian John Heilbron. I shall argue that, despite the many other differences between Feyerabend and Heilbron, they both approach the affair with a perspective which is secular-minded, but appreciative of religion, and yet conducted in the belief that the affair is one of those topics that are too important to leave to religious believers. I label such an approach the "Berkeley para-clerical" approach because it is practiced not only by these two luminaries of the University of California, Berkeley, but also by

other scholars who are graduates of the same institution. One of these is the distinguished historian Ronald Numbers, who has studied the controversy over evolution and creationism. The analysis of the work of these other scholars leads us to a deeper understanding of this para-clerical approach in terms of a family of notions such as impartiality, judiciousness, objectivity, non-partisanship, even-handedness, and balanced judgment.

A Summary of the Galileo Affair

It will be useful to begin with a succinct summary of the Galileo affair.¹ In 1543, Copernicus published an epoch-making book, *On the Revolutions of the Heavenly Spheres*. In it, he advanced an argument in favor of the idea that the earth rotates daily on its axis and re-

volves yearly around the sun. The argument amounted to showing that the known facts about the motion of heavenly bodies could be explained better on the basis of the heliocentric geokinetic hypothesis than on the basis of Ptolemy's geocentric geostatic theory.

Although novel and significant, Copernicus's argument was hypothetical and inconclusive. Moreover, there were many arguments against the earth's motion, stemming from astronomical observation, Aristotelian physics, traditional epistemology, and scriptural interpretation. These objections were advanced by astronomers, mathematicians, and natural philosophers, as well as theologians and churchmen, and by Protestants as well as Catholics. They can be summarized as follows.

The earth's motion seemed philosophically and epistemologically absurd because it contradicted direct sense experience; in fact, neither Copernicus nor anyone else could see, feel, or otherwise perceive the earth's motion. From the perspective of the science of motion, the motion of the earth seems physically impossible because the available laws of motion (stemming from Aristotle) implied that bodies on a rotating earth would, for example, follow a slanted rather than vertical path in free fall, and would be thrown off by centrifugal force. From the point of view of astronomy, the earth's motion seemed to be empirically false because it had consequences that could not be observed; for example, terrestrial and heavenly bodies would have to have similar physical properties; the planet Venus would have to exhibit phases similar to those of the moon; and the fixed stars would have to undergo a yearly shift in their apparent position, called annual stellar parallax. Finally, the earth's motion seemed theologically heretical because it contradicted the words and the traditional interpretations of Scripture, such as the passage in Joshua 10:12-13.

Thus, Copernicanism attracted few followers. Galileo himself, in the first twenty years of his career (1589-1609), was *not* one of them. His stance toward Copernicanism then was one of *indirect pursuit*, an attitude that is not only weaker than *acceptance*, but also weaker than *direct pursuit*: his research focused on physics rather than astronomy; he was critical of Aristotelian physics and favorably inclined toward an Archimedean approach; he had intuited that the Copernican hypothesis of the earth's motion was more consistent with the new science of motion he was developing

than was the geostatic theory; but at that time he felt that, overall, the arguments against Copernicanism were stronger than those in favor of it.

However, in 1609-1610, by means of the newly invented telescope, Galileo made several startling discoveries, which he immediately published in a book entitled *The Sidereal Messenger*: that the moon's surface is rough, full of mountains and valleys; that innumerable other stars exist besides those visible with the naked eye; that the Milky Way and what had been traditionally called nebulas are dense collections of large numbers of individual stars; and that the planet Jupiter has four moons revolving around it at different distances and with different periods. Soon thereafter, he also discovered the phases of Venus and sunspots; and in 1613, he published a book *On Sunspots*.

The new telescopic evidence removed most of the observational-astronomical objections against the earth's motion and added new evidence in its favor. Galileo now believed not only that the geokinetic theory had greater explanatory coherence than the geostatic theory (as Copernicus had shown); not only that it was physically and mechanically more adequate (as Galileo's new physics suggested); but also that it was empirically and observationally more accurate in astronomy (as the telescope now revealed). His assessment was now that the arguments and evidence for the earth's motion were collectively stronger than those for the earth being at rest; in other words, that Copernicanism was more likely to be true than the geostatic world view. However, he realized that this strengthening of Copernicanism was not equivalent to settling the issue, because there was still some astronomical counter-evidence (mainly, the lack of annual stellar parallax); because the physical objections had not yet been explicitly refuted and the physics of a moving earth had not yet been published; and because the scriptural objection had not yet been answered.

Besides realizing that the pro-Copernican arguments were still not absolutely conclusive, Galileo must have also perceived the potentially explosive character of the scriptural objection. In fact, for a number of years he did not get involved despite the fact that his *Sidereal Messenger* had been attacked by several authors on biblical grounds, among others. Eventually, however, he was dragged into the theological discussion. He was careful enough not to publish his criticism of the scriptural objection, but to circulate it privately, in the

form of letters. The first one, in 1613, was addressed to his former student Benedetto Castelli, professor of mathematics at the University of Pisa, while a more elaborate version, in 1615, was addressed to the Grand Duchess Christina, mother of Cosimo II de' Medici, grand duke of Tuscany.

Galileo's criticism, although complex and liable to misunderstanding, was logically compelling, rhetorically persuasive, and theologically sophisticated. And in this context, it should be stressed that his efforts were parallel and complementary with those of other progressive Catholic theologians and philosophers, such as Paolo Antonio Foscarini and Tommaso Campanella.

However, despite winning this intellectual argument, Galileo lost the practical struggle. In 1615, after some formal complaints were filed against him, the Inquisition launched an investigation. The proceedings lasted about a year, and the results were the following. In 1616, the Congregation of the Index issued a decree declaring that the doctrine of the earth's motion was physically false and contrary to Scripture; it also condemned and permanently banned Foscarini's book entitled *Letter on the Pythagorean Opinion* (1615), which had argued that the earth's motion was probable and not contrary to Scripture; and it temporarily prohibited Copernicus's book *On the Revolutions*, until and unless it was revised. Although Galileo was not mentioned at all in the decree, in private he was given a warning.

This warning exists in two versions. One is written on a certificate given to Galileo and signed by Cardinal Robert Bellarmine, who was an authoritative member of both the Congregations of the Index and of the Inquisition; it states that Bellarmine informed Galileo that, in light of the Index's decree, the earth's motion could not be held or defended. The second version is in an unsigned note written by a notary and found in the file of Inquisition trial proceedings; it states that the commissary general of the Inquisition gave Galileo the special injunction not to hold, defend, or discuss in any way the earth's motion. The difference between Bellarmine's friendly warning and the commissary's special injunction is that the latter adds a more stringent prohibition to the one mentioned in the former: besides being prohibited, like other Catholics, to hold and defend the Copernican opinion, Galileo in addition was specially forbidden to discuss it in any way whatever.

For the next several years, Galileo behaved as if he was bound by Bellarmine's warning, but as if he had no knowledge of the special injunction. That is, he refrained from supporting or defending the earth's motion, although he discussed it incidentally in the context of a controversy over comets. The situation changed in 1623, when an admirer of Galileo, Cardinal Maffeo Barberini, became Pope Urban VIII. From several indications, Galileo came to the conclusion that if he exercised the proper care, he could publish a book on the dangerous topic.

Thus, in 1632, Galileo published a work entitled *Dialogue on the Two Chief World Systems, Ptolemaic and Copernican*. The book was obviously a discussion of the earth's motion, but the discussion took the form of a critical examination of all the arguments for and against the idea; the arguments on both sides were presented, analyzed, and evaluated. He tried his best to carry out his evaluation fairly and validly. The arguments for the earth's motion turned out to be much better than those against it. This was at worst an *implicit* defense of Copernicanism.

Galileo's hope and gamble was that friendly Church officials would not blame him for this; that they would recognize that the defense was not explicit; and that therefore they would judge that he had acted within the spirit of Bellarmine's warning. Galileo's attempt misfired not because it was foolhardy or unreasonable, but because in 1632 the special injunction came to the surface, and from its point of view any discussion of the earth's motion by Galileo was prohibited, whether or not it amounted to a defense. Thus, in the fall of that year he was summoned to Rome to face the Inquisition.

The proceedings did not begin until April. At the first hearing, Galileo was asked about the events of 1616 and the *Dialogue* of 1632. He admitted receiving from Bellarmine the warning that the earth's motion could not be held or defended, but only discussed hypothetically. He denied receiving a special injunction not to discuss the topic in any way whatever, and in his defense he introduced the certificate he had obtained from Bellarmine in 1616 which only mentioned the prohibition to hold or defend. Galileo also claimed that the book did not really defend the earth's motion, but rather suggested that the favorable arguments were inconclusive, and so did not violate Bellarmine's warning.

The special injunction must have surprised Galileo as much as Bellarmine's certificate surprised the inquisitors. In fact, it took three weeks before they decided on the next step. The inquisitors opted for what might be called out-of-court plea-bargaining: they would not press the most serious but most questionable charge (namely, violation of the special injunction), but Galileo would have to plead guilty to a lesser and more provable charge (namely, transgression of the warning not to defend Copernicanism). He decided to cooperate, but requested a few days to devise a dignified way of pleading guilty to the lesser charge.

Thus, at later hearings, he stated that the first deposition had prompted him to re-read his book. He was surprised to find that it gave readers the impression that the author was defending the earth's motion, even though this had not been his intention. He attributed his error to wanting to appear clever by making the weaker side look stronger. He was sorry and ready to make amends.

The trial ended on 22 June 1633 with a harsher sentence than Galileo had been led to believe. The verdict found him guilty of a category of religious crime intermediate between the most and the least serious, called "vehement suspicion of heresy"; the suspiciously heretical beliefs were the cosmological thesis that the earth moves and the methodological principle that the Bible is not a scientific authority. Thus, he was forced to recite a humiliating "abjuration." And the *Dialogue* was banned.

The sentence also states that he was to be held in prison indefinitely. However, this particular penalty was immediately commuted to house arrest. Accordingly, for about one week he was confined to Villa Medici, a sumptuous palace in Rome belonging to the Tuscan grand duke. Then for about five months he was sent to the residence of Siena's archbishop, who was a good friend of Galileo's. Finally, in December 1633 he was allowed to live in seclusion at his own villa in Arcetri, near Florence.²

While the Inquisition's condemnation in 1633 ended the original Galileo affair, it gave rise to a new one that continues to our own day. To begin to make sense of it, I stress that the subsequent affair has three principal aspects: the historical aftermath; the critical issues; and the reflective commentary.

The historical aftermath consists of facts and events directly stemming from the trial. Here, we can just

highlight the actions taken by the Church. In 1740 to 1758, Pope Benedict XIV allowed the partial unbanning of Galileo's *Dialogue* and of Copernican books in general. In 1820 to 1835, there was a total repeal of the prohibition of the Copernican doctrine. In 1893, Pope Leo XIII published an encyclical containing an implicit theological vindication of Galileo's biblical hermeneutics, although his name was not even mentioned. In 1942, during the commemoration of the tricentennial of Galileo's death, several Church officials started publicizing an appreciation of Galileo-the-person, as a model of harmony between science and religion. And in 1979-1992, Pope (now Saint) John Paul II undertook a further "rehabilitation"³ of Galileo.

The critical issues of the subsequent controversy in part reflect the original issues. However, the subsequent controversy has also acquired a life of its own, with debates over new issues, such as whether the condemnation of Galileo illustrates the incompatibility between science and religion. Indeed, traditionally this condemnation has been viewed as epitomizing such a conflict. Here, it is important to note that this view has been advanced not only by relatively injudicious authors such as [Draper \(1875\)](#) and [White \(1896\)](#), who have recently been widely discredited (cf. [Brooke 1991](#); [Lindberg and Numbers 1987](#)), but also by such scientific, philosophical, and cultural icons as [Einstein \(1953\)](#), [Russell \(\[1935\] 1997\)](#), and [Popper \(1963\)](#).

The reflective commentary on the original trial consists of countless interpretations and evaluations advanced in the past four centuries by astronomers, physicists, theologians, churchmen, historians, philosophers, cultural critics, playwrights, novelists, and journalists.

Although distinct, these three principal aspects of the subsequent affair are obviously interrelated. For example, much of the reflective commentary consists of attempts to formulate or resolve one or more critical issues, and such formulations often represent important developments of the historical aftermath.

In this essay, I shall focus on a particular development in the very recent historical aftermath. This involves primarily the accounts advanced by philosopher Paul Feyerabend and by historian John Heilbron. They raise relatively novel issues in the ongoing subsequent controversy.

Feyerabend on the Galileo Affair

Let us begin with the account advanced by Feyerabend (1985; 1987, 247-64; 1988, 129-38; 1993, 125-34). He portrays Galileo's trial as involving a conflict between two philosophical attitudes toward, and historical traditions about, the role of experts. That is, Galileo allegedly advocated the uncritical acceptance by society of the views of experts, whereas the Church advocated the evaluation by society of the views of experts in the light of human and social values. Feyerabend extracts this principle from Cardinal Bellarmine's letter to Foscarini (cf. Finocchiaro 2014, 78-80). Moreover, he judges the principle favorably, in the sense that "the Church would do well to revive the balance and graceful wisdom of Bellarmine, just as scientists constantly gain strength from the opinions of ... their own pushy patron saint Galileo" (Feyerabend 1985, 164). More generally, Feyerabend claims that "the Church at the time of Galileo not only kept closer to reason as defined then and, in part, even now; it also considered the ethical and social consequences of Galileo's views. Its indictment of Galileo was rational and only opportunism and a lack of perspective can demand a revision" (Feyerabend 1988, 129; 1993, 125).

In my opinion, Feyerabend's account is untenable. In part, it is not really supported by the texts to which he refers. However, the principal difficulty is that he seems to commit a fallacy of equivocation. For the principle in question could mean either that *social and political leaders* should evaluate the *use* of experts' views in light of human and social values, or that *scientists* should evaluate the *truth* of each other's views in light of human and social values.

Now under the first interpretation, Galileo did not reject the principle, but rather would have agreed with it. Moreover, when Feyerabend attributes this principle to Bellarmine, the documentation is unclear and unconvincing. In any case, in this regard, the difference between Galileo and Bellarmine was not one of principle but of application. For example, they would have disagreed on who the relevant experts were, in particular whether theologians should be counted as experts in physics and astronomy; another disagreement would have been whether the views of theological experts should be subject to the same requirement.

Under the second interpretation, the principle was

indeed rejected and criticized by Galileo. However, it is in fact untenable. For this version of the principle cannot survive the objections (which we moderns have inherited from Galileo) against teleological and anthropomorphic ways of thinking; such thinking reduces to arguing that something is true because it is useful, beneficial, or good, and false because it is useless, harmful, or bad.

However, whether untenable or not, Feyerabend's account is important, for at least two reasons, one historiographical, the other cultural.

Historiographically speaking, Feyerabend's account may be appreciated as an updated and revised conflictual thesis about the relationship between science and religion.⁴ It was advanced in an essay with the revealing title of "Galileo and the Tyranny of Truth"; and this essay was a contribution to a 1985 conference on "The Galileo Affair: A Meeting of Faith and Science," sponsored by the Cracow Pontifical Academy of Theology and the Vatican Astronomical Observatory (cf. Coyne, Heller, and Zycinski 1985). The conference thus appears to have had an apologetic or pro-clerical aim, in the sense that it was meant to substantiate and elaborate Pope John Paul II's harmony thesis regarding the relationship between science and religion; that is, the thesis that science and religion are generally in harmony with one another, and that in particular the Galileo affair really proves this harmony, rather than their incompatibility, as commonly thought. Feyerabend did contribute an account which is in one sense apologetic and pro-clerical, but which remains conflictual, and so is critical and anti-clerical in another sense. This, of course, is the kind of irony and iconoclasm at which Feyerabend was a master.

Note that Feyerabend is reversing not the traditional type of *interpretation*, but rather what may be called the traditional *evaluation*. In fact, at the interpretive level, he sees a conflict between Galileo and the Church. However, at the evaluative level, he is (in the historical context) siding with the Church and against Galileo, insofar as he thinks that the principle advocated by the Church was sounder than the one advanced by Galileo. At the same time, since the Church in the meantime has herself switched sides, the result is that Feyerabend is upholding the past Church against the present-day Church. The content and nature of Feyerabend's evaluation became more obvious later, in the 1988 edition of his book *Against Method*,

where he explicitly criticized the rehabilitation efforts of Saint Pope John Paul II with the (in)famous words I have already quoted, to the effect that the Church was right to condemn Galileo, and would be wrong to rehabilitate him now, because she was upholding principles of rationality, morality, and social wellbeing that are sounder than Galileo's. And this substantiates my earlier remark that Feyerabend's account is apologetic and pro-clerical in one sense, but critical and anti-clerical in another sense. However, a clarification about these terms is in order.

Here, the labels *pro-clerical*, *anti-clerical*, *apologetic*, *pro-Galilean*, and *anti-Galilean* are intended to have a descriptive, informative, and piecemeal connotation, rather than a loaded, inflammatory, holistic, or name-calling meaning. Thus, note that I apply these terms primarily to theses and not to persons, and that in my account authors often advance views that are a mixture of such orientations; moreover, pro-clerical and pro-Galilean are not meant to be opposite. For example, note that here I am describing Feyerabend's account as pro-clerical in one sense, but anti-clerical in another. The non-invidious and nonloaded character of these terms may also be seen from the fact that I would have little difficulty describing certain parts of my own account as pro-clerical, and certain other parts as pro-Galilean.

My main point here is that Feyerabend's account provides a good illustration of how an ingenious scholar can formulate an interesting thesis, which is an updated and sophisticated version of the traditional, otherwise discredited, conflictual account.

A second reason for the importance of Feyerabend's account is cultural, in the sense of the historical repercussions it has had. In fact, it has become involved in one of the latest twists to the subsequent Galileo affair, which brings the story to our own day.

On the one hand, Feyerabend's apologia was politely rejected in 1989-1990 by Cardinal Joseph Ratzinger, who at the time was the chairman of the Congregation for the Doctrine of the Faith (the new name of the Inquisition); who in 2005 became Pope Benedict XVI; and who then resigned his position in 2013, thus becoming "Emeritus" pope. In a scholarly essay, in the context of an analysis of the role of faith in the revolutionary geopolitical changes happening in 1989-1990, Cardinal Ratzinger quoted several anti-Galilean cri-

tiques, including Feyerabend's. However, Ratzinger went on to criticize such views as expressions of skepticism and philosophical insecurity, asserting that "it would be foolish to construct an impulsive apologetic on the basis of such views; faith does not grow out of resentment and skepticism with respect to rationality, but only out of a fundamental affirmation and a spacious reasonableness ... I mention all this only as a symptomatic case that permits us to see how deep the self-doubt of the modern age, of science and of technology goes today" (Ratzinger 1994, 98).

On the other hand, there seems to be a very widespread tendency to confuse or conflate Feyerabend's view with Ratzinger's. Some authors (Socci 1993, 62; Sinke Guimarães 2005, 6) have claimed simply that Cardinal Ratzinger or Pope Benedict XVI *accepts* Feyerabend's view. Other authors (Machamer 2005; Saka 2006) have gone so far as to attribute this claim directly to Cardinal Ratzinger or Pope Benedict, without giving any indication that he was quoting Feyerabend. There have been some attempts to clarify the situation (Accattoli 1990, 15; Feyerabend 1993, 133-34 n. 20; Finocchiaro 2008, 274 n. 19), but apparently to no avail.

In fact, in January 2008 such confusion triggered the following clash (cf. Cini 2007; Anonymous 2008). A few months earlier, Pope Benedict XVI had accepted an invitation by the rector of the University of Rome to deliver the keynote address at the formal ceremony inaugurating the new academic year. This plan, however, triggered protests by students and faculty, especially in the university's distinguished department of physics. They objected primarily on the grounds of the principle of separation of Church and State, but also in part because, as they stated, they felt offended and humiliated by the pope's view of Galileo's condemnation, expressed some twenty years earlier when the pope was still a cardinal; that is, by his sharing Feyerabend's view. In the light of such opposition, and the potential for unrest and violence, the pope cancelled his speech.

This controversy is not helped, but rather exacerbated, by what seems to be a recurrent pattern of thinking or lecturing on the part of Benedict XVI, namely flirting with equivocation by means of quoting a controversial view. For example, an analogous issue arose as a result of a lecture he delivered at the University of Regensburg on 12 September 2006, in which he

quoted a remark made by Byzantine emperor Manuel II Paleologus in 1391 regarding Islam and holy war (Ratzinger 2006). Now, given the post-nine-eleven geopolitical situation, Benedict did make a sustained effort to clear up the latter misunderstanding. But it appears that he has made no such effort regarding the approval of Galileo's condemnation.

In sum, Feyerabend elaborated an account of the Galileo affair that is conflictualist, anti-Galilean, and partly pro-clerical and partly anti-clerical. He interpreted the controversy as rooted in a conflict between Galileo's ideal of a value-free natural science, and the Church's ideal of a morally and social responsible natural philosophy. And Feyerabend evaluated the two sides by arguing that the Church was right and Galileo wrong, or at least that she was more nearly right than he was. In my judgment, Feyerabend's account is historically and philosophically untenable. However, from a methodological or historiographical point of view, his account represents an ingenious and clever version of the conflict thesis regarding the problem of science vs. religion. Moreover, from a cultural point of view, his account is significant and consequential insofar as it has become injected and involved into the latest developments and the highest levels of that continuing cause célèbre which is the Galileo affair.

Interesting as all this may be, in the present context I want to focus on something which is presumably even more intriguing. That is, Feyerabend exemplifies an unusual but important cognitive attitude, or scholarly approach, which combines a secular perspective and a clerical focus. However, before describing and analyzing it further, let me hasten to discuss another example.

Heilbron on the Galileo Affair

In 2010, John Heilbron published a massive and impressive biography of Galileo. Although the occasion seems to have been the International Year of Astronomy, commemorating the 400th anniversary of Galileo's telescopic discoveries, there is no question that the book was rooted in Heilbron's long and distinguished career, during which he has studied almost every aspect of the history of modern physics and astronomy, from the seventeenth to the twentieth century. The book ends with a section discussing the prospects for the Galileo affair coming to an end (Heilbron 2010, 358-65). This discussion embodies

two theses: the main and more explicit thesis is the prediction that sooner or later the Catholic Church will canonize Galileo and make him a saint; a corollary and less explicit thesis is an endorsement of such an action to the effect that the canonization of Galileo would be proper.

These conclusions are no mere afterthought designed to give the book an interesting and provocative ending. In fact, Heilbron first discussed these ideas in a book published eleven years earlier, entitled *The Sun in the Church* (1999), and subtitled *Cathedrals as Solar Observatories*. In the middle of that book, in a chapter relating the centuries-long story of how the Church accommodated herself to Copernicus's doctrine of a moving earth, there is a section entitled "Galilaeus Sanctificatus" (Heilbron 1999, 207-11); and this is essentially an earlier version of the 2010 discussion that makes up the ending of the Galileo biography. Moreover, about halfway between these two books, Heilbron (2005) contributed a chapter to a collective volume on *The Church and Galileo*, edited by Ernan McMullin. In that chapter, entitled "Censorship of Astronomy in Italy after Galileo," although Heilbron does not advance the canonization thesis, or even discuss the issue, he does give a polished, synthetic, and neutral account of the story; and these historical developments are what provide him with the elements from which to argue in support of his prediction and endorsement in his 2010 book. In any case, that book's ending does indeed contain a supporting argument, which is certainly not an afterthought. Let us examine that argument.

To begin with, Heilbron wisely distinguishes two strands in the history of the subsequent Galileo affair: one pertains to the Church's attitude toward the Copernican doctrine of the earth's motion, which Heilbron (2010, 358-62) discusses in a section entitled "Off the Index"; the other strand involves the condemnation of Galileo the person and the Church's attitude toward him, which Heilbron (2010, 362-65) discusses in a section entitled "On the Rota?". The astronomical-physical part of the story consists of a series of small and gradual steps designed to moderate or retract the Church's opposition to Copernican astronomy. That story lasted about two centuries, beginning in 1616 when the Congregation of the Index declared the earth's motion false and contrary to Scripture, and ending in 1835 when Galileo's *Dialogue* was taken off the *Index*, after the Congregation of the Inquisition

had decreed in 1822 that Catholics were free to hold the theory of the earth's motion in accordance with modern astronomy. This may strike one as the dark story of the commission of a monumental mistake, followed by a slow and reluctant recognition of the fact, and by various actions designed to repair the damage. However, Heilbron manages to find a value and a positive lesson, as we can see from the following critical appreciation of ecclesiastic behavior:

The policy of tolerating violations of the law when enforcement would do more harm than good, and annulling the law when violation has become ordinary practice, is often employed in church and state. A good administrator, like a good judge, knows when to be implacable and when to be lenient. Church officials who connived at ways to elude the force of the decrees against Copernicanism deserve notice and credit. Historians have ignored them because in not doing their jobs—that is, in not attempting to enforce a ridiculous and injurious ruling—they made no noise and because the imputed immobility of the Church over the two hundred years or so between the condemnation and the reprieve of the *Dialogue* makes too good and simple a story to ruin with facts. The Roman Catholic Church itself does not claim the wise inaction of its censors as a contribution to science in Italy. The Galileo Commission created at the instigation of Pope John Paul II missed an opportunity to blunt criticism of the Church by noticing officials who found a practical way out of the predicament into which Urban VIII and his Holy Office had plunged it. [Heilbron 2005, 280]

Let us now examine the other strand of the subsequent Galileo affair, involving the personal condemnation of Galileo. Heilbron stresses a number of milestones, as he calls them. The first occurred in 1893, with the encyclical *Providentissimus Deus* by Pope Leo XIII (Heilbron 2010, 362-63; cf. Finocchiaro 2005, 263-66). It elaborates a view of the relationship between scientific investigation and biblical interpretation that corresponds to the one advocated by Galileo; the authority of Scripture is explicitly limited to questions of faith and morals, and carries no weight for questions of physical truth and the world of nature.

The second milestone was occasioned by the tricentennial of Galileo's death in 1942 (Heilbron 2010,

363; cf. Finocchiaro 2005, 275-94). A number of Church officials commemorated the event by advancing or publishing views that portrayed Galileo as a Catholic hero who understood and practiced the very important doctrine that science and religion are in harmony because they both derive from God: science studies the Work of God, religion studies His Word. They also credited Galileo for his spirit of sacrifice and piety when at the trial, in deference to unambiguous Church commands, he abjured his scientific beliefs.

A third milestone occurred on the 400th anniversary of Galileo's birth in 1964, during the Second Vatican Council (Heilbron 2010, 363; cf. Finocchiaro 2005, 326-30). In response to various churchmen's proposals for a rehabilitation of Galileo, two related actions were taken. First, the Pontifical Academy of Sciences published an important pro-Galilean biography of Galileo, written two decades earlier by a clergyman named Pio Paschini (1964). Second, in the Council's constitution *Gaudium et spes* (approved on 7 December 1965), the Church affirmed explicitly the autonomy of science in general and deplored her wrongful interference in some cases in the past; and the text had a footnote mentioning the case of Galileo and referring the reader to Paschini's book.

Finally, there was the rehabilitation of Galileo by Pope John Paul II in the period 1979-1992 (Heilbron 2010, 363-64; cf. Finocchiaro 2005, 338-58). Recognizing the first milestone (of 1893), John Paul was explicit that Galileo's hermeneutical principles, unlike those of his ecclesiastical opponents, were correct, and that they correspond to those which the Church herself adopted starting with Leo XIII's *Providentissimus Deus*. Recognizing the second milestone (of 1942), John Paul reiterated that Galileo was also right about the harmony between science and religion, and that this doctrine also corresponds to the one which the Church herself holds. And John Paul went beyond the earlier cryptic admission of wrongdoing at the Second Vatican Council (of 1964-65); he was clearer and more explicit that the condemnation of Galileo had been not only a mistake, but also been an injustice.

Heilbron is well aware that this strand of the affair, unlike the strand involving the Copernican theory, is not over yet. Indeed he is quite realistic about how long the resolution will take: in his 1999 book, he spoke of about 100 years; in his 2010 book, he spoke of about 400 years, a period equivalent to that which

has already elapsed. Nevertheless, Heilbron suggests that such rehabilitations of Galileo will continue, until sooner or later they will reach the level of canonization. The key part of his argument amounts to the following steps: describe the milestones just mentioned; point out that they obviously constitute a trend or tendency; postulate that the trend will continue; and thus reach a conclusion about the end result. Moreover, Heilbron's case for canonization has three subsidiary parts.

One subsidiary part is the accumulation of judgments and statements about Galileo's extraordinary and superhuman virtues on the part of his many followers and admirers, during the past four centuries (Heilbron 2010, 364-65). Then there is the business of his relics: just as for the case of other saints, various people and institutions are keen to find, collect, display, and revere various parts of Galileo's body (Heilbron 2010, 365). Thirdly, Heilbron sees it fit to defend Galileo's canonization prospects from a crucial possible objection, involving miracles. Here, Heilbron's words are worth quoting:

It might be objected that Galileo performed no miracles. What then were the miracles of Thomas Aquinas? In fact, Galileo performed a stupendous miracle. He obliterated the ancient distinction between the celestial and terrestrial realms, raised the earth to the heavens, made the planets so many earths, and revealed that our moon is not unique in the universe. Not since the creation had there been such a refashioning. Then there was the miracle of himself, a rare combination of talents and personalities, who, despite mania and depression, arthritis, gout, hernias, blindness, and overindulgence in wine and wit lived to write three books—the [*Sidereal*] *Messenger*, the *Dialogue*, and the *Discourse*—any one of which would have given him enduring fame. [Heilbron 2010, 365]

Heilbron ends his book with the following rhetorical question: "According to Galileo's mechanics, the slightest force can move the greatest weight given sufficient time. The direction of motion is clear. Who can doubt that within another 400 years the church will recognize Galileo's divine gifts, atone for his sufferings, ignore his arrogance, and make him a saint?" (Heilbron 2010, 365).

I believe that Heilbron's prediction cannot be dis-

missed. I have tried to reconstruct his argument in a plausible and sympathetic light. The fact that he gives such an argument means that it would be irrelevant to object that he is not serious, and does not really mean what he says. For even if that were the case, it would not invalidate the argument and evidence presented. Nevertheless, I am not sure I share Heilbron's prediction, and I do not find his argument convincing. The key weakness is the following.

If we study the milestones of the Church's rehabilitation efforts described above, they each had a dark, negative, anti-Galilean side. Leo's encyclical *Providentissimus Deus* of 1893 does not even mention Galileo, let alone credit him with the right hermeneutics. The tricentennial rehabilitation of 1942 included the censorship and non-publication of the biography commissioned to Paschini by the Pontifical Academy of Sciences, on the grounds that the book was too pro-Galilean and anti-Jesuitical. The actions at the Second Vatican Council of 1964-65 included the publication of Paschini's book in a censored version, consisting of the deletion or revision of the more pro-Galilean and anti-Jesuitical passages. John Paul's rehabilitation of 1979-1992 included the following paradox spread by the chairman of the Vatican Commission on Galileo (Cardinal Paul Poupard) and uncritically accepted by the pope: that although Galileo was right, and his ecclesiastical opponents wrong, with regard to biblical interpretation and hermeneutical questions, the reverse was the case with regard to scientific, methodological, and epistemological questions; Galileo was not aware of the weaknesses of his pro-Copernican arguments and evidence and of the epistemological limitations in general of scientific arguments for establishing the truth, whereas Pope Urban VIII and Cardinal Bellarmine were, and they attempted without success to enlighten Galileo about it. This is an old apologetic strategy first elaborated by Pierre Duhem (1908; 1969), and recently updated by a German clergyman named Walter Brandmüller (1982; 1992).

I do not want to give the impression that Heilbron is unaware that the various rehabilitation milestones have such anti-Galilean aspects. There is no question that he knows about them, since his discussion mentions and describes them. However, what I am saying is that Heilbron does not seem to realize that the existence of this other side in the Church's rehabilitation efforts casts doubt on what we can predict about

the end result. For this anti-Galilean side amounts to the existence in this story of another trend opposing the one on which he focuses and which he wants to extrapolate into the future. I think both conflicting trends must be taken into account. If we do that, the safer and more plausible prediction to make is that in the next rehabilitation effort something will be done to credit Galileo in some way and admit some ecclesiastic wrongdoing, but in such a way as to come up short of a full-fledged Galilean exoneration and clerical retraction, perhaps on account of some previously neglected, or recently updated, or newly invented Galilean flaw. Extrapolating this pattern onto the final end result 100 or 400 or 1000 years from now, the chances are that we will have the following outcome. To echo the words with which Heilbron concludes his book, “the church will recognize Galileo’s divine gifts, atone for his suffering, ignore his arrogance” (Heilbron 2010, 365) but *refuse* (I say) “to make him a saint” (Heilbron 2010, 365).

For example, the issue of miracles, which Heilbron tries to pre-empt and defuse, could easily provide such a pretext. In fact, miracles are a very serious business for the Church, and must be conceived in a material sort of way that involves concrete deliverance from physical ailments afflicting real living persons; they cannot be conceived as intellectual or mental achievements, as Heilbron seems to do. And the case of Saint Thomas Aquinas, which Heilbron attempts to utilize, confirms this and underscores the difficulties which Galileo’s canonization would have. Aquinas died in 1274 and was canonized by Pope John XXII, at Avignon, within fifty years (in 1323). As Aquinas’s latest biographer states, the bull of canonization, which “extolled the 300 miracles by the new saint ... is not ... explicit on Thomas’s intellectual work” (Torrell 1996, 1:321). I conclude that if feats like the Christianization of Aristotle did not help Aquinas become a saint, it is unlikely that Galileo’s raising the earth to the heavens would facilitate his canonization.

In a sense, Heilbron’s argument is a typical example of the pitfalls to which almost everyone is irresistibly drawn in the business of making predictions about the future based on the existence of demonstrated or demonstrable past tendencies or trends. The pitfalls involve the assumption that the past trends will continue, and the neglect of countervailing trends. The most spectacular and culturally significant such prediction with such pitfalls was Karl Marx’s prediction in the

nineteenth century of the downfall of capitalism. One could conceptualize this problem by defining a corresponding logical fallacy and exploring general principles for avoiding it, but such logical theorizing and criticism are beyond the scope of the present inquiry. Instead, my aim here is to conceptualize Heilbron’s account (as well as Feyerabend’s) in general methodological terms. To that theme I now turn.

The Berkeley Para-clerical Approach

Recall that, for the case of Feyerabend’s account of the Galileo affair, I had not only some substantive criticism, but also some methodological appreciation. Similarly, for the case of Heilbron’s canonization thesis, I have just articulated a substantive criticism of its supporting argument. However, this criticism of Heilbron should not make you forget that I devoted even more time and space to a sympathetic reconstruction of his position, on the firm belief in the scholarly originality and cultural importance of his canonization thesis and the canonization issue in general. Still, all this is relatively preliminary, and however interesting it may be, it does not yet touch something else which is potentially even more important, namely the similarities between Feyerabend and Heilbron.

To be sure, there are many differences between Feyerabend and Heilbron, disciplinary as well as biographical, general as well as particular, formal as well as substantive. For example, Feyerabend is a philosopher, Heilbron a historian; also, note that their positions are at almost opposite ends of the evaluative spectrum. However, here I want to stress the characteristics they share.

There are at least four things which they seem to have in common. First, they both hail from Berkeley. Heilbron studied and was trained at the University of California, Berkeley; he taught there from 1967 to 1994; he founded and directed its Office for the History of Science and Technology; he served as university Vice-Chancellor (of academic affairs) for several years, until he retired; and he has continued his association with this institution. As for Feyerabend, he taught at Berkeley for more than 30 years, even longer than Heilbron, from 1958 to 1989. Note, in particular, that they were colleagues for about 22 years.

Second, neither Feyerabend nor Heilbron are Galilean specialists; that is, Galileo is *not* their first, main,

or only scholarly concern. On the contrary, they were drawn to Galileo by other interests. In Feyerabend's case, he began working in the philosophy of physics, quantum mechanics in particular; then, partly under the influence of Karl Popper, Feyerabend made some contributions to general methodology. The key link was provided by the historical approach to the philosophy of science, that is, the use of the history of science to formulate and test philosophical claims about the nature of science, especially the utilization of significant episodes or great figures such as the Copernican Revolution and Galileo. In Heilbron's case, his primary interest may be said to be the history of physics, modern physics of the past four centuries; his earlier work dealt with atomic physics in the twentieth century, and with electricity in the seventeenth and eighteenth centuries. Whether or not one accepts Albert Einstein's and Stephen Hawking's judgment of Galileo as the father of modern physics (Einstein 1954, 271; Hawking 1988, 179), it is not surprising that a historian of physics with broad interests would sooner or later develop views about Galileo and find reasons to write them down. The importance of this shared trait is that it gives them a perspective on Galilean topics, relatively free of vested interests.

Third, both Feyerabend and Heilbron are master literary stylists, whose prose is anything but prosaic, but rather full of wit, irony, sarcasm, humor, double entendre, playfulness, and many other figures of speech that are beyond my own repertoire. This shared characteristic may seem irrelevant, but is important for at least two reasons. First, they share such a literary and rhetorical dimension with Galileo himself, and so in part they may have learned it from him and may thereby be trying to emulate him. Second, such a practice raises the question of whether what they say can or should be taken literally or at face value. In Feyerabend's case, there are well-known examples when he was pressed to elaborate and defend his published claims, and responded by saying that he had been playacting, being an iconoclast and a provocateur. And in Heilbron's case, I raised the issue earlier, resolving it by pointing out that, playacting or not, in his writings on the issue of Galileo's canonization there is argumentation and evidence which is real and consequential, even if introduced in a playacting mode. Still, the rhetorical dimension of the writing and work of Feyerabend, Heilbron, and Galileo may lend itself to a twist, as we shall see later.

Be that as it may, a more important trait of Feyerabend's and Heilbron's accounts of the Galileo affair is the following. Both Feyerabend and Heilbron are secular-minded scholars, and yet they are keenly concerned with questions about the relationship between science and religion. Moreover, their writings on this topic often contain frank advice to the Catholic Church about the conduct of her Galilean affairs. Furthermore, they often credit the Church, or defend her, in ways which Catholics themselves, clergymen or not, would not dare to do. It's as if Feyerabend and Heilbron believe that some Catholic affairs are too important to be left to Catholics themselves. This sort of attitude and practice takes intellectual courage, strong self-confidence, analytical subtlety, and experienced judgment.

Such an attitude and approach are clearly reminiscent of Galileo's own. In this regard, one revealing remark is found in a letter Galileo wrote just after the condemnation of Copernicanism in 1616 (cf. Finocchiaro 2014, 108-109). Heilbron mentions it on more than one occasion, and describes the situation by saying that "Galileo occasionally referred to himself as a saint in his self-appointed mission to enlighten the Church" (Heilbron 1999, 211; cf. 2010, 364). This Galilean saintly self-image is part of Heilbron's case for the canonization thesis. However, I take it as evidence of the approach of secular-minded concern with, and service to, religion and the Church. Another important occasion when Galileo expressed his secular-minded concern with religion is in the classic *Letter to the Grand Duchess Christina*, in which he defends himself from the clerical criticism that he is a heretic because he believes in the earth's motion, which contradicts Scripture. In the introductory part of this essay, he gives some background information and makes a number of clarifications. One of these is the following contrast between the attitude of his enemies and his own:

They always shield themselves with a simulated religious zeal, and they also try to involve Holy Scripture and to make it somehow subservient to their insincere objectives; against the intention of Scripture and of the Holy Fathers (if I am not mistaken), they want to extend, not to say abuse, its authority, so that even for purely physical conclusions which are not matters of faith one must totally abandon the senses and demonstrative arguments in favor of any scriptural passage whose

apparent words may contain a different indication. Here I hope to demonstrate that I proceed with much more pious and religious zeal than they when I propose not that this book [Copernicus's *Revolutions*] should not be condemned, but that it should not be condemned without understanding, examining, or even seeing it, as they would like. [Galilei 2008, 113-14]

This approach which I have extracted from Feyereabend and Heilbron, and which I have also attributed to Galileo, has more cultural resonance and presence than it may appear at first. I believe it corresponds to the fundamental inspiration, motivation, and aim of the International Society for Science and Religion, the scholars associated with it, and the works that represent it. Here, as supporting evidence I would cite a book entitled *A Companion to the ISSR Library of Science and Religion*, edited by Pranab Das (2011), consisting of reviews of 224 books on the topic.

Furthermore, despite the indisputable Berkeley connection, it goes without saying that many scholars not associated with Berkeley practice such a methodological approach. In this regard, I would mention Agassi (1971), Blackwell (1991; 1998a; 1998b; 2006), DiCanzio (1996), Fantoli (2003; 2012), Pera (1998), and Segre (1997; 1998), just to limit myself to good examples from the field of Galilean studies, which I know best.⁵

On the other hand, I would not say that this approach constitutes a school. For I do not think that the number of practitioners is sufficiently large or that their critical mass is great enough; nor has their self-reflective awareness and articulation of the approach reached a sufficient degree of explicitness; and the same applies to the degree of scholarly and academic organization. In this regard, I would contrast this situation with the historical approach to the philosophy of science, which does seem to have all the requisites to be a school.

Similarly, it should be added that many Berkeley scholars have done excellent work on the interaction between science and religion, but do not practice this methodological approach; and this applies even to some outstanding Galileo scholars, such as Biagioli (1993; 2006). My point is that this approach, important and fruitful as I believe it is, has no monopoly on truth and goodness.

Nevertheless, the Berkeley connection cannot be dismissed lightly, for it cannot be a fortuitous coincidence that another distinguished practitioner of this approach holds a history Ph.D. from there, namely Ronald Numbers (1993; 2009; cf. Das 2011, 133-36). Numbers, who was awarded the Sarton Medal in 2008, studies the history of scientific creationism, and manages to follow a secular-minded approach on questions about the relationship between evolutionary biology and biblical creationism. More generally, he conceived the project of bringing together scholars who have contributed to dispelling myths about science and religion, from the ancient Greeks to the twenty-first century; and then he edited a collection of resulting essays under the title *Galileo Goes to Jail and Other Myths about Science and Religion*. Numbers's concluding words in the book's introduction give a good flavor of the approach I am trying to articulate:

The contributors to this volume have no obvious scientific or theological axes to grind. Nearly half, twelve of twenty-five, self-identify as agnostic or atheist (that is, unbelievers in religion). Among the remaining thirteen there are five mainstream Protestants, two evangelical Protestants, one Roman Catholic, one Jew, one Muslim, one Buddhist—and two whose beliefs fit no conventional category (including one pious Spinozist). Over half of the unbelievers, including me, grew up in devout Christian homes—some as fundamentalists or evangelicals—but subsequently lost their faith. I am not sure exactly what to make of this fact, but I suspect it tells us something about why we care so much about setting the record straight. [Numbers 2009, 6-7]

What I would add is that we are dealing with a cognitive phenomenon important enough to deserve a name. Partly echoing Numbers, and retaining the Berkeley connection, we could call this approach and these scholars “Berkeley clerical fact-checkers.” But such emphasis on setting the record straight and fact checking strikes me as too naïve, uncritical, or positivistic. Perhaps we could label it the “Berkeley clerical pundit syndrome”; but the term syndrome would carry too negative a connotation. A more positive description would be “Berkeley clerical rescue service”; but that is perhaps too positive and somewhat crass. I think it may be best to drop all the terms introducing extra or extraneous connotations, and retain the bare essentials. Perhaps that would be accomplished by

calling it simply the “Berkeley para-clerical” approach.

At this point someone might object to my label by suggesting that the word *Berkeley* be replaced by the word *Galilean* or by the term *Feyerabendian-Heilbronian*, or be dropped altogether. However, this semantical question is relatively unimportant, and I shall not pursue it here. It is more important to try to describe and analyze this approach more clearly, more precisely, and more deeply, to which I now turn.

Numbers’s Version of the Para-clerical Approach

In the context of the Galileo affair, and more generally the interaction between science and religion, I have illustrated and introduced what I call the Berkeley para-clerical approach. So far I have characterized this approach in terms of being secular-minded, offering advice to the Church, crediting the Church for uncommon reasons, defending the Church from common criticism, believing in the superiority of religious outsiders over insiders, and intellectual courage. These traits require some elaboration.

Let us focus on just two things. First, although the term *secularism* can be given various nuances of meaning, I believe a common core of all is the connotation of some kind of “indifference to or rejection or exclusion of religion and religious considerations.”⁶ Having said this, the next question that immediately arises for the analyst is: what exactly are indifference, rejection, and exclusion. Still, to have said this is not totally opaque or unhelpful. Secondly, to believe or act as if Church affairs and history are too important to be left to churchmen or religious believers, whatever else it may imply, certainly implies that on such topics the secular or nonreligious investigator has an advantage over an investigator who is a religious believer.

Thus, here we have two specific attitudes that are anti-clerical, in the sense of being critical of or opposed to the Church. On the other hand, in the Berkeley para-clerical approach, one displays such an attitude in order to perform a service to the Church by offering useful advice, giving her due credit, and defending her from unfair criticism; and here we have three distinct pro-clerical attitudes. I believe that in so doing the para-clerical scholar is trying to properly combine the pros and the cons, in the belief that the topic is so important that one must avoid being one-sided or going too far along any one side. In other words, we

are talking about committed and critical impartiality or judiciousness.

Such clarifications are useful partly because some of Ron Numbers’s self-reflections explicitly bring out such a perspective. To begin with, Numbers’s choice of topic is precisely what one would expect from such impartiality or judiciousness. Referring to his history of scientific creationism, Numbers insightfully says: “In writing this history, I have chosen to concentrate on those creationists who possessed, or claimed to possess, scientific credentials. This might strike some readers as an odd choice of topic for a historian of science, but I would submit that one of the best ways to learn about the history of ‘science’ is to explore how interested parties have contested its boundaries. Many books in recent years have sought to discredit creationism scientifically or theologically, but only a few have examined the movement historically ...” (Numbers 1993, p. xiv).

Here, Numbers is using one connotation of the term *historical* to clarify his own approach. According to this connotation, to be historical is to be objective. In turn, objectivity does not mean being merely descriptive and avoiding evaluation altogether, which is impossible and self-defeating when the topic is a contested or controversial one. Rather, in such contexts, objectivity means being accurate in one’s descriptions and fair in one’s evaluations. And fairness in turn means avoiding one-sidedness and taking all sides properly into account, although of course this is not a mechanical task that can be reduced to following simple and precise rules, such as splitting the difference between the opposite sides; rather, it involves essentially the exercise of judgment.

Next, one of the major theses which Numbers elaborates may be regarded as an illustration of the para-clerical approach. This thesis is a substantive claim about the history of scientific creationism, and it asserts, in his own words:

Rather than finding clerics arrayed in simple opposition to scientists, we discover conflicts of a different sort: psychological, as creationists struggled to reconcile the apparently conflicting claims of science and Scripture; and social, as they quarreled with one another over competing scientific and biblical interpretations or contested the boundaries of science and religion with evolutionists in courthouses, legislative halls, and

school-board rooms. In virtually every public battle, even when creationists squared off against evolutionists, scientists and preachers could be found on both sides, and sometimes in unexpected numbers. For example, ... the Arkansas creation-evolution trial of 1981 ... prompted the Protestant theologian Langdon Gilkey ... to observe that the only “warfare” in Little Rock found “liberal religion and liberal science on the one side, and absolutist religion and its appropriate ‘science’ on the other.” [Numbers 1993, pp. xiv-xv]

Finally, Numbers’s criticism of alternative approaches adds another variation on the same theme:

For too long now students of science and religion have tended to grant the former a privileged position, often writing more as partisans than historians and grading religious “beliefs” by how much they encouraged or retarded the growth of scientific “knowledge.” Recently we have heard persuasive calls for a more even-handed treatment. But even academics who would have no trouble empathetically studying fifteenth-century astrology, seventeenth-century alchemy, and nineteenth-century phrenology seem to lose their nerve when they approach twentieth-century creationism and its fundamentalist proponents ... In other words, although many scholars seem to have no trouble respecting the unconventional beliefs and behaviors of peoples chronologically and geographically removed from us, they substitute condemnation for comprehension when scrutinizing their own neighbors. I think it is profitable to get acquainted with the neighbors, especially so if we find them so threatening. [Numbers 1993, pp. xvi-xvii]

Here, Numbers uses the notions of “non-partisanship” and “even-handedness” as two additions to that family of terms which I have been extracting: impartiality, judiciousness, objectivity, and judgment calls.

It seems to me that Numbers’s self-reflective pronouncements are not only important in themselves, but also revealing with regard to the para-clerical approach. In fact, such self-reflections may be usefully compared to those we find in a work which was produced by another Berkeley Ph.D., and which was published in 1989 by the University of California Press as

the inaugural volume of the California Studies in the History of Science. This book is a collection of the most important documents pertaining to the trial and condemnation of Galileo from 1613 to 1633. Here is how he summarizes the approach he is advocating, at the end of a methodological and historiographical discussion in the Introduction:

To summarize, a balanced approach to the study of the Galileo affair must avoid the two opposite extremes exemplified by the anti-Galilean and the anti-Catholic interpretations. There is no easy way of doing this, but it may help to distinguish scientific from epistemological issues, factual correctness from rational correctness, essential correctness from total correctness, the several epistemological issues from each other, intellectual from external factors, and the several external factors from each other (personal, psychological, social, economic, and political). However ... these distinct entities are also interrelated, so the point is not to deny their interaction, but to make sure they are not confused with one another.⁷

Let me add here the usual caveat about theory vs. practice; that is, more important than saying such things and expressing such self-reflective pronouncements is to actually do them and to put them into practice in one’s investigations. Indeed, just as Numbers practices in the course of his investigation what he preaches in the pronouncements quoted earlier, so does this other scholar. This is evident from the reactions of readers, who easily recognize that the book does follow this approach. One such reader is a distinguished outsider, legal scholar Alan Dershowitz, who writes: “*The Galileo Affair* should be required reading for everyone who values freedom and fears censorship. The extraordinary virtue of this collection of documents ... is that it presents both sides of the dispute. ‘Both sides?’ you are probably thinking. Is there really a procensorship side of this particular debate that is worth reading? In answering that question, it must be recalled that at the time Galileo published his arguments, there was no dispositive empirical evidence that he was correct” (Dershowitz 1991).

Finally, besides the methodological similarity (at both the reflective and practical levels) between Numbers and this other Berkeley graduate, it is simply uncanny to find another similarity with regard to a main substantive thesis that illustrates the approach. I am

referring to Numbers's thesis (mentioned above) that, in the history of the creation vs. evolution controversy, the real conflict has been not between science and religion, but between liberal science and religion on one side and absolutist science and religion on the other. Here is what this other author has written regarding this topic: "Because the Galileo Affair involved a conflict between one of the founders of modern science and one of the world's great religious institutions, it has traditionally been taken as an example of the warfare between science and religion ... [However] even a cursory reading of the relevant documents shows that many churchmen were on his side and many scientists were on the opposite side; thus, there was a split within both science and religion, along the lines of what may be called conservation and innovation; so the real conflict was between a conservative and a progressive attitude."⁸

Conclusion

I have been arguing that the methodological self-reflections of Numbers and this other scholar not only correspond to each other in tone and content, but also correspond to the methodological practices of Feyerabend and Heilbron in their accounts of the Galileo affair. Those self-reflections correspond to one another insofar as they both stress notions such as impartiality, judiciousness, objectivity, non-partisanship, even-handedness, and balanced judgment in the handling of controversial topics such as the Galileo affair, creation vs. evolution, and science vs. religion in general. And they correspond to the Feyerabend-Heilbron approach to the Galileo affair, which attempts to combine a generally secular and clerically external perspective with a concern to help, appreciate, and defend the Church when appropriate.

I have named this the Berkeley para-clerical approach, because it has been pioneered by these Berkeley professors and graduates. However, I have indicated that it is much more widespread than such a label might suggest. For example, I have argued that it is reminiscent of the approach which Galileo himself followed in matters of science vs. religion. I have also pointed out that this approach is practiced by a number of non-Berkeley scholars. And I have suggested that this approach is important and fruitful, and deserves even greater adoption. At the same time I have made it clear that this approach, like any other, is not infallible; and my substantive criticism of Feyerabend's

and Heilbron's accounts may be taken to show this. Indeed infallibility is one of those religious doctrines toward which the para-clericals can only show indifference, rejection, or exclusion, to echo the canonical dictionary definition of secularism quoted above.

Finally, some personal clarifications and qualifications are in order. First, it is obvious that the fourth scholar cited above is the present writer; thus, the references and quotations given above are offered as evidence that I do indeed practice the para-clerical approach. Moreover, there is no doubt that I learned this approach at Berkeley; that is, in part from Feyerabend and Heilbron, who were my teachers and dissertation advisors. Additionally, my doctoral dissertation was not on Galileo, but on the historiography of science, in the sense of the philosophy and methodology of the history of science (Finocchiaro 1973); like them, only later was I drawn to Galileo, partly because one of my historiographical case studies was Alexandre Koyré's work on Galileo, and that led me to learn more about Galileo. However, another reason for my attraction to Galileo was that I felt he could serve as a good model to emulate in the search for the truth and acquisition of knowledge; and of course, the emulation could only be judicious and critical, and not mechanical or blind.

On the other hand, recall that, as presented above, the Berkeley para-clerical approach includes (as a minor component) the literary style and rhetorical flourish which Feyerabend and Heilbron, and indeed Galileo, like to use and display. And in this regard, for better or worse, I am not sure I have yet mastered, or ever learned, this Feyerabendian-Heilbronian style and rhetoric, especially the double-entendre and playfulness. In any case, even if I had, I might not want to use or display it on the present occasion. Thus, I hope readers will resist the temptation to misinterpret my rhetoric of Berkeley para-clericalism; they should not just dismiss it, or take it as mere rhetoric; but also they should not take that rhetoric more seriously than the substance of how this approach actually studies the relationship between Galileo and the Church, creationism and evolutionism, and more generally science and religion. In short, readers should be even-handed and impartial in their analysis of my rhetoric.

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References

- Accattoli, Luigi. 1990. “Tutti d’accordo su Galileo.” *Corriere della sera*, 30 March, p. 15.
- Agassi, Joseph. 1971. “On Explaining the Trial of Galileo.” *Organon* 8:137-66.
- Anonymous. 2008. “Pope quotes Feyerabend and gets in big trouble at leading Italian university.” Leiter Reports: A Philosophical Blog, available at: <http://leiterreports.typepad.com/blog/2008/01/pope-quotes-f-1.html> (accessed 17 January 2008).
- Beltrán Mari, Antonio. 2006. *Talento y poder: Historia de las relaciones entre Galileo y la Iglesia católica*. Pamplona: Laetoli.
- Biagioli, Mario. 1993. *Galileo courtier*. Chicago: University of Chicago Press.
- ———. 2006. *Galileo’s instruments of credit*. Chicago: University of Chicago Press.
- Blackwell, Richard J. 1991. *Galileo, Bellarmine, and the Bible*. Notre Dame: University of Notre Dame Press.
- ———. 1998a. “Could there be another Galileo case?” In Machamer 1998, 348-66.
- ———. 1998b. *Science, religion and authority: Lessons from the Galileo affair*. Milwaukee, WI: Marquette University Press.
- ———. 2006. *Behind the scenes at Galileo’s trial*. Notre Dame: University of Notre Dame Press.
- Brandmüller, Walter. 1982. *Galilei und die Kirche, oder das Recht auf Irrtum*. Regensburg: F. Pustet.
- ———. 1992. *Galilei e la Chiesa, ossia il diritto di errare*. Vatican City: Libreria Editrice Vaticana.
- Brooke, John H. 1991. *Science and religion*. Cambridge: Cambridge University Press.
- Brooke, John H., and Geoffrey Cantor. 1998. *Reconstructing nature*. Edinburgh: Clark.
- Bucciantini, Massimo. 1995. *Contro Galileo*. Florence: Olschki.
- ———. 2003. *Galileo e Keplero*. Turin: Einaudi.
- Camerota, Michele. 2004. *Galileo Galilei e la cultura scientifica nell’età della Controriforma*. Rome: Salerno Editrice.
- Cini, Marcello. 2007. Lettera aperta al Rettore dell’Università La Sapienza di Roma (14 November). Available at: www.sinistra-democratica.it (accessed 4 February 2008).
- Coyne, George V., M. Heller, and J. Zycinski, eds. 1985. *The Galileo affair: A meeting of faith and science*. Vatican City: Specola Vaticana.
- Das, Pranab K., II, ed. 2011. *A companion to the ISSR library of science and religion*. Cambridge: International Society for Science and Religion.
- Dershowitz, Alan. 1991. “Introduction.” In Finocchiaro 1991.
- DiCanzio, Albert. 1996. *Galileo: His science and his significance for the future of man*. Portsmouth: Adams Publishing Company.
- Draper, John W. 1875. *History of the conflict between religion and science*. New York: Appleton.
- Duhem, Pierre. 1908. *SOZEIN TA PHAINOMENA: Essai sur la notion de theorie physique de Platon à Galilée*. Paris: Hermann.
- ———. 1969. *To Save the phenomena*. Trans. E. Doland and C. Maschler. Chicago: University of Chicago Press.
- Einstein, Albert. 1953. “Foreword.” In *Dialogue concerning the two chief world systems*, by Galileo Galilei, trans. Stillman Drake, pp. vi-xx. Berkeley: University of California Press.
- ———. 1954. *Ideas and opinions*. Trans. and ed. Sonja Bargmann. New York: Crown Publishers.
- Fantoli, Annibale. 2003. *Galileo: For Copernicanism and for the Church*. 3rd edition. Trans. G.V. Coyne. Vatican City: Vatican Observatory Publications.
- ———. 2012. *The case of Galileo*. Trans. G.V. Coyne. Notre Dame: University of Notre Dame Press.
- Feyerabend, Paul K. 1985. “Galileo and the tyranny of truth.” In Coyne, Heller, and Zycinski 1995, 155-66. (Reprinted in Feyerabend 1987, 247-64.)
- ———. 1987. *Farewell to reason*. London: Verso.
- ———. 1988. *Against method*. Revised edition. London: Verso.
- ———. 1993. *Against method*. 3rd edition. London: Verso.

- Finocchiaro, Maurice A. 1973. *History of science as explanation*. Detroit: Wayne State University Press.
- ———. 1980. *Galileo and the art of reasoning*. Dordrecht: Reidel.
- ———, trans. and ed. 1989. *The Galileo affair: A documentary history*. California Studies in the History of Science, vol. 1. Berkeley: University of California Press.
- ———, trans. and ed. 1991. *The Galileo affair: A documentary history*. Special edition, in “The Notable Trials Library.” New York: Gryphon Editions.
- ———, trans. and ed. 1997. *Galileo on the world systems*. Berkeley: University of California Press.
- ———. 2005. *Retrying Galileo, 1633–1992*. Berkeley: University of California Press.
- ———. 2008. “The Church and Galileo.” *Catholic Historical Review* 94:260–82.
- ———. 2009. “Myth 8: That Galileo was imprisoned and tortured for advocating Copernicanism.” In Numbers 2009, 68–78, 249–52.
- ———. 2010. *Defending Copernicus and Galileo*. Dordrecht: Springer.
- ———. 2012. “The Copernican revolution and the Galileo affair.” In *The Blackwell companion to science and Christianity*, ed. J.B. Stump and A.G. Pudgett, 14–25. Malden: Wiley-Blackwell.
- ———. 2013. *The Routledge guidebook to Galileo’s Dialogue*. London: Routledge.
- ———, trans. and ed. 2014. *The trial of Galileo: Essential documents*. Indianapolis: Hackett.
- ———. 2015. Essay-review of Thomas Mayer’s *The Roman Inquisition: Trying Galileo*. *Reviews in History*. DOI: 10.14296/RiH/2014/1836, available at: <http://www.history.ac.uk/reviews/review/1836> (accessed 10 November 2015).
- Galilei, Galileo. 2008. *The essential Galileo*. Ed. and trans. M.A. Finocchiaro. Indianapolis: Hackett.
- Hawking, Stephen W. 1988. *A brief history of time*. New York: Bantam Books.
- Heilbron, John L. 1999. *The sun in the church: Cathedrals as solar observatories*. Cambridge: Harvard University Press.
- ———. 2005. “Censorship of astronomy in Italy after Galileo.” In McMullin 2005, 279–322.
- ———. 2010. *Galileo*. Oxford: Oxford University Press.
- Lindberg, David C., and Ronald L. Numbers, eds. 1986. *God and nature*. Berkeley: University of California Press.
- ———. 1987. “Beyond war and peace.” *Perspectives on Science and Christian Faith* 39:140–49.
- ———, eds. 2003. *When science & Christianity meet*. Chicago: University of Chicago Press.
- Machamer, Peter, ed. 1998. *The Cambridge companion to Galileo*. Cambridge: Cambridge University Press. <http://dx.doi.org/10.1017/CCOL0521581788>
- ———. 2005. Review of Finocchiaro’s *Retrying Galileo*. *Science* 309:58.
- Mayer, Thomas F. 2015. *The Roman Inquisition: Trying Galileo*. Philadelphia: University of Pennsylvania Press. <http://dx.doi.org/10.9783/9780812290325>
- McMullin, Ernan, ed. 2005. *The Church and Galileo*. Notre Dame: University of Notre Dame Press.
- Numbers, Ronald L. 1993. *The creationists*. Berkeley: University of California Press. <http://dx.doi.org/10.1515/9783110974362.248>
- ———, ed. 2009. *Galileo goes to jail and other myths about science and religion*. Cambridge: Harvard University Press.
- Paschini, Pio. 1964. *Vita e opere di Galileo Galilei*. 2 vols. Vatican City: Pontificia Accademia delle Scienze.
- Pera, Marcello. 1998. “The God of the theologians and the God of the astronomers.” In Machamer 1998, 367–88.
- Popper, Karl R. 1963. “Three views of human knowledge.” In idem, *Conjectures and Refutations*, 97–119. New York: Harper.
- Ratzinger, Joseph. 1994. *A turning point for Europe?* Trans. Brian McNeil. San Francisco: Ignatius Press.
- ———. 2006. “Faith, reason, and the university.” Lecture delivered at the University of Regensburg, 12 September. Available at: http://www.vatican.va/holy_father/benedict_xvi/speeches/2006/sep-tember/documents/hf_ben-xvi_spe_20060912_university-regensburg_en.html (accessed 30 December 2014).
- Russell, Bertrand. [1935] 1997. *Religion and science*. New York: Oxford University Press.
- Saka, P. 2006. Letter to the editor, 27 February. *American Scientist on Line*. Available at: <http://www.americanscientist.org/template/Bookshelf-LetterTypeDetail/assetid/50287> (accessed 6 May 2006).
- Segre, Michael. 1997. “Light on the Galileo case?” *Isis* 88:484–504. <http://dx.doi.org/10.1086/383771>
- ———. 1998. “The never ending Galileo story.” In Machamer 1998, 388–416.

- ———. 1999. "Galileo: a 'rehabilitation' that has never taken place." *Endeavour* 23(1):20-23. [http://dx.doi.org/10.1016/S0160-9327\(99\)01185-0](http://dx.doi.org/10.1016/S0160-9327(99)01185-0)
 - Sinke Guimarães, Atila. 2005. "The swan's song of Galileo's myth." Available at: www.traditioninaction.org/History/A_003_Galileo.html (accessed 15 July 2005).
 - Soggi, Antonio. 1993. "Scienza e fede: Accademia o politica?" *30 giorni*, vol. 11, no. 1, pp. 60-63.
 - Speller, Jules. 2008. *Galileo's Inquisition trial revisited*. Frankfurt: Peter Lang.
 - Torrell, Jean-Pierre. 1996. *Saint Thomas Aquinas*. 2 vols. Trans. Robert Royal. Washington: Catholic University of America Press.
 - White, Andrew D. 1896. *A history of the warfare of science with theology in Christendom*. 2 vols. New York: Appleton.
- This topic deserves further study and reflection, but is obviously beyond the scope of the present investigation.
- [6] Merriam-Webster Dictionary online, at: <http://www.merriam-webster.com/dictionary/secularism>, consulted on 30 December 2014.
- [7] Finocchiaro 1989, 10.
- [8] Finocchiaro 1997, 3; cf 2005, 3-4; 2010, pp. xxix-xxx; 2012, 22-24; 2013, 311-14.

Endnotes

[1] For more details, see, e.g., Beltrán Marí 2006, Blackwell (1991; 1998a; 1998b; 2006), Bucciattini (1995; 2003), Camerota 2005, Fantoli (2003; 2012), Finocchiaro (1980; 1989; 2005; 2010; 2013; 2014; 2015), Heilbron (1999; 2010), Mayer 2015, and Speller 2008.

[2] For details about Galileo's non-imprisonment, see Finocchiaro 2009.

[3] The quotation marks around this word are meant as scare quotes, for it is unclear whether there really was a rehabilitation, and if so what kind and to what extent. This will become apparent in the discussion below, where I will usually speak of rehabilitation efforts, although I will avoid the pedantry of constantly using the scare quotes. On this issue, besides the references given below, see also Segre 1999.

[4] For some good examples of the voluminous literature on this problem, see Brooke 1991, Brooke and Cantor 1998, Das 2011, Finocchiaro (2010, 291-314; 2012, 14-25; 2013, 311-14), Lindberg and Numbers (1986; 1987; 2003), and Numbers 2009.

[5] It should be noted that a high proportion of such scholars (namely, Feyerabend, Agassi, Pera, and Segre) seem to be followers of Karl Popper, in one fashion or another. This fact may be significant, and there may indeed be an important connection between a Popperian orientation and the para-clerical approach.