

TRUTH AND VALUE TODAY: GALILEO CONTRA BELLARMINE

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1.

Whenever science and religion collide, the condemnation of Galileo is almost inevitably mentioned as the most obvious example of the Church abusing its authority by trying to subject science to its will, denying the freedom that is demanded by the pursuit of truth: that philosophical freedom on which Giordano Bruno had so courageously and for him disastrously insisted.¹ With his precursor's fate in mind, Galileo was less courageous, but more prudent. Such prudence may have been strengthened by a conviction that, no matter what victories those who would silence those who speak the truth can claim, in the end truth will win out. And indeed: was the Church not forced to accept the truth defended by Galileo? In 1820 the Catholic astronomer Joseph Settele was allowed to teach the earth's motion as an established fact; in 1822 the Church allowed books teaching it to be published; in 1835 Galileo's *Dialogue Concerning the Two Chief World Systems*, condemned in 1633, was omitted from the list of forbidden books; in 1893, in the encyclical *Providentissimus Deus*, Pope Leo XIII endorsed a view of the relationship of science and Biblical interpretation rather like that insisted on by Galileo in his "Letter to the Grandduchess Christina"; and finally, on November 10, 1979, Pope John Paul II, in a speech celebrating the centenary of Einstein's birth, admitted that Galileo had been treated unjustly by the Church, praised his religiousness, and singled out for special praise his understanding of the relationship of sci-

¹ Bruno pleaded for *philosophica libertas* in his valedictory oration to the professors at Wittenberg (1588). Campanella and Galileo were to reiterate that plea. See John M. Headley, *Tommaso Campanella and the Transformation of the World* (Princeton: Princeton University Press, 1997), pp. 172–173, fn 109.

ence and religion.² Here then we would seem to have the most famous example of the futility of all attempts to stifle free and independent inquiry in the name of orthodoxy. And is this not in accord with what St. Thomas already taught: that there is only one truth and that when science really establishes a truth, such truth cannot contradict Scripture. So let us not repeat the errors of the past.

But was the Church really so blind? Is Pope John Paul II's praise of Galileo's understanding of the relationship of science and religion deserved? Just how did Galileo understand that relationship? At issue here is not so much the truth of the Copernican position embraced by Galileo, as the meaning of truth and, bound up with this and more importantly, the problem of the value of truth, raised so insistently by Nietzsche, especially in *Beyond Good and Evil* and *On the Genealogy of Morals*.³ Nietzsche thought that there was a deep connection between the commitment to truth presupposed by modern science and nihilism. How then can religion make its peace with science?

Nietzsche placed Copernicus at the origin of our nihilism: "Since Copernicus, man seems to have got himself on an inclined plane – now he is slipping faster and faster away from the center into – what? into nothingness? into a *penetrating* sense of his own nothingness?" "Has the self-belittlement of man, his will to self-belittlement not progressed irresistibly since Copernicus? Alas, the faith in the dignity and uniqueness of man, in his irreplaceability in the great chain of being, is a thing of the past – he has become an animal, literally and without reservation and qualification, he who was, according to the old faith, almost God ('child of God', 'Godman')." ⁴

Already Schopenhauer had recognized the nihilistic implications of our post-Copernican cosmology. Here the beginning of Volume Two of *The World as Will and Representation*: "In endless space countless luminous spheres, round each of which some dozen smaller illuminated ones revolve, hot at the core and covered with a hard cold crust; on this crust a mouldy film has produced

² Maurice A. Finocchiaro, *The Galileo Affair: A Documentary History* (Berkeley, Los Angeles, London: University of California Press, 1989), pp. 306–308. Pope John Paul II's "Mémorial de la Naissance d'Albert Einstein," November 10, 1979, is now readily available on the internet: http://www.vatican.va/holy_father/john_paul_ii/speeches/1979.

³ Friedrich Nietzsche, *Jenseits von Gut und Böse*, I, 1, *Sämtliche Werke, Kritische Studienausgabe*, ed. Giorgio Colli and Mazzino Montinari (Munich, Berlin, and New York: Deutscher Taschenbuch Verlag and de Gruyter, 1980), vol. 5, p. 15 and *Zur Genealogie der Moral*, III, 24, *Kritische Studienausgabe*, vol. 5, pp. 398–401.

⁴ Nietzsche, *Zur Genealogie der Moral*, III, 25, *Kritische Studienausgabe*, vol. 5, p. 404. Trans. Walter Kaufmann and R. J. Hollingdale, *On the Genealogy of Morals and Ecce Homo* (New York: Vintage, 1989), p. 155.

living and knowing beings; this is empirical truth, the real, the world.”⁵ Our science knows nothing of privileged places, of absolute values, of home. And if what that science teaches us to accept as truth is identified with *the* truth, then, if we are to escape from nihilism, will we not have to cover up the truth or abandon it altogether? Could the insistence on *the* truth be an obstacle to living the good life? An obstacle to salvation or whatever might take the place of salvation given that death of God proclaimed by Nietzsche?

Nietzsche appropriated Schopenhauer’s dismal if sublime vision in the very beginning of his youthful fragment *On Truth and Lie in an Extra-Moral Sense*, now so popular with post-modern critics weary of all centers: “Once upon a time, in some out of the way corner of that universe which is dispersed into numberless twinkling solar systems, there was a star upon which clever beasts invented knowing. That was the most arrogant and mendacious minute of ‘world history,’ but nevertheless, it was only a minute. After nature had drawn a few breaths, the star cooled and congealed, and the clever beasts had to die.”⁶ Nietzsche here emphasizes the immense disproportion between our life-time and the time of the world: does our post-Copernican universe, which threatens to reduce the time and space allotted to us to insignificance, care for us?⁷ Was Nietzsche not right to insist that the progress that celebrates its triumphs in modern science and technology is necessarily attended by the specter of nihilism? The price of the rigorous pursuit of the facts of nature appears to be the progressive loss of whatever gives significance to human existence.

Pope Paul John II, to be sure, rejects this, calling science a universal good, to be freely pursued. But could Nietzsche have been right? If the pursuit of truth and nihilism should indeed be linked, it becomes easy to understand those who would take a step beyond nihilism by showing that what science takes to be truth is itself only a fiction; and it is not surprising that such sentiments should have found a welcome focus in a re-evaluation of the condemnation of Galileo. Can human beings ever claim to have seized *the* truth? Richard Rorty’s *Mirror of Nature*⁸ gives symptomatic expression to such

⁵ Arthur Schopenhauer, *Die Welt als Wille und Vorstellung*, vol 2 (Brockhaus: Wiesbaden, 1965), p. 3. Trans. *The World as Will and Representation*, vol. 2, trans. E. F. J. Payne (New York: Dover, 1966), p. 3.

⁶ Friedrich Nietzsche, “Über Wahrheit und Lüge im aussermoralischen Sinne,” *Kritische Studienausgabe*, vol. 1, p. 875; trans. “On Truth and Lie in an Unmoral Sense,” *Philosophy and Truth. Selections from Nietzsche’s Notebooks of the Early 1870’s*, trans. and ed. Daniel Breazeale (Atlantic Highlands: Humanities Press, 1979), p. 79.

⁷ See Hans Blumenberg, *Lebenszeit und Weltzeit* (Frankfurt am Main: Suhrkamp, 1996).

⁸ Richard Rorty, *Philosophy and the Mirror of Nature* (Princeton: Princeton University Press, 1979), pp. 328–333.

a re-evaluation: in that book Rorty asks whether today we can “find a way of saying that the considerations advanced against the Copernican theory by Cardinal Bellarmine – the scriptural descriptions of the fabric of the heavens – were ‘illogical’ or ‘unscientific?’” Rorty argues that today we have to answer this question with a “no”.

The argument ... centers around the claim that the lines between disciplines, subject matters, parts of culture, are themselves endangered by novel substantive suggestions. ... Bellarmine thought the scope of Copernicus’s theory was smaller than might be thought. When he suggested that perhaps Copernican theory was just an ingenious heuristic device for, say, navigational purposes and other sorts of practically oriented celestial reckoning, he was admitting that the theory was, within its proper limits, accurate, consistent, simple, and perhaps even fruitful. When he said that it should not be thought of as having wider scope than this he defended his view by saying that we have excellent independent (scriptural) evidence for believing that the heavens were roughly Ptolemaic.

Rorty goes on to ask: “What determines that Scripture is *not* an excellent source of evidence for the way the heavens are set up?” He thus invites us to think Cardinal Bellarmine’s attempt to limit the scope of Copernicus’ astronomical claims as fundamentally no different from Galileo’s attempt to limit the scope of Scripture. Both Galileo and the Bible claim to describe “the way the heavens are set up”. As it turned out, the future made Galileo the victor. The establishment of science, as we tend to take it for granted, is part of that victory. But this, according to Rorty, does not justify the claim that Galileo had reason on his side.

The notion of what it was to be “scientific” was in the process of being formed. If one endorses the value – or, perhaps, the ranking of competing values – common to Galileo and Kant, then indeed Bellarmine was being “unscientific.” But, of course, almost all of us (including Kuhn, though perhaps not including Feyerabend) are happy to endorse them. We are the heirs of three hundred years of rhetoric about the importance of distinguishing sharply between science and religion, science and politics, science and art, science and philosophy, and so on. This rhetoric has formed the culture of Europe. ... But to proclaim our loyalty to these distinctions is not to say that there are “objective” or “rational” standards for adopting them.

Galileo and Kant happened to win the argument. But Rorty is unwilling to say that they won it because they had reason on their side: we simply do not know how to draw a clear line between theological and scientific discourse. We do not possess an understanding of truth sufficiently robust to allow us to draw it.

I want to make the opposite claim: we can draw such a distinction by appealing to the nature of truth. We don't just happen to endorse the values common to Galileo and Kant because we are the heirs of a certain rhetoric "about the importance of distinguishing sharply between science and religion." The commitment to objectivity that is a presupposition of science is inseparable from the pursuit of truth concerning the things that make up our world. To claim this, however, is not yet to claim to have answered the Nietzschean question of the value of that pursuit.

2.

But how are we to understand this pursuit? What is truth? Most people, although perhaps no longer most philosophers, would seem to be quite untroubled by this old Pilate question, quite ready to say with Kant that the meaning of truth is correspondence and that this is so obvious that it can be "*geschenkt, und vorausgesetzt*,"⁹ granted and presupposed without need for much discussion. The essence of truth is here thought to lie in the agreement of the judgment with its object.

To be sure, as Kant recognized, we use truth in different senses. He thus distinguished such "material (objective) truth" from a merely formal or logical truth, where knowledge agrees with itself, abstracting from all content, and from merely aesthetic or subjective truth, where our understanding agrees with the subject and what appears to it. Error results when we mistake what is merely subjective for what is objective, mistake appearance for truth.¹⁰ In this essay I am concerned first of all with the meaning and value of material, objective truth.

But just because it calls such truth into question, Kierkegaard's claim, "Truth is subjectivity," deserves some attention. Truth is understood here as "An objective uncertainty held fast in an appropriation-process of the most personal inwardness" – Kierkegaard was thinking of love and faith. This he calls "the highest truth attainable for an *existing* individual." In such attainment

⁹ Immanuel Kant, *Kritik der reinen Vernunft*, A 58/ B 82.

¹⁰ Kant, *Logik*, A 69–A 83.

the individual perfects him- or herself. And did not Kant understand “truth” as “the essential and inseparable condition of all perfection of knowledge”?¹¹ Kant might have questioned whether such subjective truth deserves to be called a perfection of knowledge. And as the expression “objective uncertainty” suggests, Kierkegaard, knew very well that first of all “the question of truth is raised in an objective manner, reflection is directed objectively to the truth, as an object to which the knower is related.”¹² But his distinction between subjective and objective truth helps to bring into focus what is at issue when Nietzsche raises the question of the value of truth: “The way of objective reflection makes the subject accidental, and thereby transforms existence into something indifferent, something vanishing. Away from the subject the objective way of reflection leads to the objective truth, and while the subject and his subjectivity become indifferent, the truth also becomes indifferent, and this indifference is precisely its objective validity; for all interest, like all decisiveness, is rooted in subjectivity.”¹³ How then can religion make its peace with the commitment to objectivity and a truth that threatens to transform the world into the totality of essentially indifferent facts? Galilean science had to call the Church’s claim to a truth that saves into question. Not that the Church would have found it easy to accept Kierkegaard’s Protestant “Truth is subjectivity”: how can organized religion make its peace with a privileging of subjectivity that threatens to deny the Church its claim to truth? But what is truth?

Thomas Aquinas defined truth as “the adequation of the thing and the understanding”: *Veritas est adaequatio rei et intellectus*.¹⁴ The definition claims that there can be no truth where there is no understanding. But can there be understanding without human beings? Does truth then depend on human beings? This would imply that there can be no eternal truths, unless human beings will be forever. But must we not dismiss that implication? When I claim some assertion to be true, I claim it, not just subjectively, here and now, but for all time, provided that I have taken into account all the relevant relativities. “Today the sun is shining” may not be true tomorrow or in some other place; but that does not mean that the state of affairs expressed in the assertion is not true *sub specie aeternitatis* and can be restated in language that removes the relativities. But does the definition of truth as the adequation of the thing and the understanding allow for such an understanding of truth? Is human

¹¹ Kant, *Logik* A 69.

¹² Søren Kierkegaard, *Concluding Unscientific Postscript*, trans. David F. Swenson and Walter Lowrie (Princeton: Princeton University Press, 1974), pp. 182, 178.

¹³ *Ibid.*, p. 173.

¹⁴ Thomas Aquinas, *Questiones disputatae de veritate*, qu. 1, art. 1.

life here on earth more than an insignificant cosmic episode? Consider once more the fable with which Nietzsche, borrowing from Schopenhauer, begins “On Truth and Lie in an Extra-Moral Sense.” Nietzsche here calls attention to the disproportion between the human claim to truth and our peripheral location in the cosmos and the ephemeral nature of our being. Must the time not come, when there will no longer be human beings, when there will be no understanding, and hence no truth?

Thomas Aquinas, to be sure, like any believer in the Biblical God, including the self-proclaimed Catholic astronomer Galileo, would have had no difficulty answering Nietzsche. His understanding of God left no room for thoughts of a cosmos from which understanding would be absent. His was a theocentric understanding of truth where we should note that the definition *veritas est adaequatio rei et intellectus* invites two readings: *veritas est adaequatio intellectus ad rem*, “truth is the adequation of the understanding to the thing” and *veritas est adaequatio rei ad intellectum*, “truth is the adequation of the thing to the understanding.” And is the second not presupposed by the first? Is there not a sense in which the truth of our assertions presupposes the truth of things or ontological truth? If we are to measure the truth of an assertion by the thing asserted, that thing must disclose itself as it really is, as it is in truth. But what could “truth” now mean? Certainly not an adequation of the thing to our finite, perspective-bound understanding: that would substitute appearances for the things themselves.

Theology once had a ready answer: every created thing necessarily corresponds to the idea preconceived in the mind of God and in this sense cannot but be true. The truth of things, understood as *adaequatio rei (creandae) ad intellectum (divinum)* secures truth understood as *adaequatio intellectus (humani) ad rem (creatam)*.¹⁵ Human knowing here is given its measure in the divinely created order of the cosmos. Copernicus and Galileo considered themselves good Christians. They would not have quarreled with any of this. And such talk of the truth of things does accord with the way we sometimes use the words “truth” and “true”: e. g., when we call something we have drawn “a true circle,” we declare it to be in accord with our understanding of what a circle is. What we have put down on paper accords with an idea in our intellect. Here the truth of things is understood as *adaequatio rei (creandae) ad intellectum (humanum)*.

But what right do we have to think that we can bridge the abyss that separates God’s infinite creative knowledge from our finite human understand-

¹⁵ See Martin Heidegger, “Vom Wesen der Wahrheit,” *Wegmarken, Gesamtausgabe*, vol. 9 (Frankfurt am Main: Klostermann, 1976), pp. 178–182.

ing? Nietzsche was to insist that there is no such bridge. If we were to seize the truth, he claims in “On Truth and Lie,” our designations would have to be congruent with things. Nietzsche here understands truth as, not just a correspondence, but as the congruence of designation and thing: pure truth, according to Nietzsche, thus would be nothing other than the thing itself.¹⁶ This recalls the traditional view that gives human discourse its measure in divine discourse. God’s creative word is nothing other than the truth of things. Here, too, our speaking is thought to have its measure in the identity of word (logos) and being. In this strong sense, truth is of course denied to us finite knowers.

Kant would have agreed with this claim: if we understand truth as the correspondence of our judgments and things in themselves, understood as noumena, another term that names the truth of things, then there is no truth available to us for Kant either. But Kant does not conclude, as Nietzsche does, that therefore we cannot give a transcendental justification of the human pursuit of truth. To be sure, theory cannot penetrate beyond phenomena; things as they are in themselves are beyond the reach of what we can objectively know. But this does not mean that the truth pursued by science is therefore itself no more than a subjective illusion. The truth of phenomena provides sufficient ground for science and its pursuit of truth. Key to our understanding of that truth is this thought: to understand that what we experience is only an appearance, bound by a particular perspective, is to be already on the road towards a more adequate, and that means here first of all less perspective-bound and in this sense freer understanding. The pursuit of truth demands a movement of self-transcendence that, by leading us to understand subjective appearance for what it is, opens a path towards a more adequate, more objective understanding. The pursuit of truth demands objectivity. Copernicus relies on this familiar pattern of thought to make his readers more receptive to his break with Aristotle and Ptolemy.

And why are we not willing to acknowledge that the appearance of a daily revolution belongs to the heavens, its actuality to the earth? The relation is similar to that of which Virgil’s Aeneas says: “We sail out of the harbor, and the countries and cities recede.” For when a ship is sailing along quietly, everything which is outside of it will appear to those on board to have a motion corresponding to the motion of the ship, and the voyagers are of the erroneous opinion that they with all that

¹⁶ Nietzsche, “Über Wahrheit und Lüge,” *Kritische Studienausgabe* vol. 1, p. 879; trans. p. 82.

they have with them are at rest. This can without doubt also apply to the motion of the earth, and it may appear as if the whole universe were revolving.¹⁷

Ornamenting his remark with a reference to the *Aeneid*, Copernicus, uses the simile likening the earth to a ship, a simile found already in Cusanus' *De docta ignorantia*, to call the reader's attention to the relativity of apparent motion. Reflection on the nature of perspective teaches us that whatever presents itself to the eye, to perception, is no more than subjective appearance. To get to "actuality" or objective reality we have to reflect on the way point of view governs what appears to us. Objective reality cannot in principle be seen as it is. It is invisible and can only be thought.

Copernicus' distinction between appearance and actuality is a presupposition of the emerging new science and of our modern understanding of reality. Nietzsche had good reason to celebrate Copernicus and Bosovich as *die beiden grössten Gegner des Augenscheins*, as the two greatest opponents of the deceptive appearances presented to us by our eyes.¹⁸ Quite in the spirit of the quoted Copernican passage, Kant thus distinguishes subjective appearances, thought relative to the embodied self and its location and make-up and hence inescapably perspectival, from the objects themselves thought relative to the transcendental subject, which as the form of all possible experience is not tied to any particular point of view.¹⁹ This allows us to think the truth of scientific propositions as their correspondence to the objects themselves, not to be confused with Kant's things in themselves, which transcend our understanding, while the objects themselves are presupposed by the scientific pursuit of truth as its goal. This pursuit would be vain, were we to place the pursued objects beyond the realm of the knowable.²⁰ But by their very nature, such

¹⁷ Nicolaus Copernicus, *De revolutionibus orbium coelestium* I, 8; Trans. in *The Portable Renaissance Reader*, ed. James Bruce Ross and Mary Martin McLaughlin (New York: Viking, 1953), p. 591.

¹⁸ See Nietzsche's letter to Heinrich Köselitz of March 20, 1882. *Sämtliche Briefe, Kritische Studienausgabe*, vol. 6, p. 183.

¹⁹ Kant, *Kritik der reinen Vernunft*, B 70 fn; see also A 29 fn.

²⁰ The direction of that pursuit is indicated by the possibility of opposing to those aspects of what we experience that change with the changing circumstances of the experiencing subject those that appear unchanged. "That in our faculty of knowledge, which in all changes of the subject remains unchanged is what is objective; that, however, that is changed together with the change in the subject is what is subjective in knowledge." Salomon Maimon, *Versuch einer neuen Logik oder Theorie des Denkens. Nebst angehängten Briefen des Philalethes an Aenesidemus* (Berlin, 1794), quoted in Ernst Cassirer, *Das Erkenntnisproblem in der Philosophie und Wissenschaft der neueren Zeit*, vol. 3, *Die nachkantischen Systeme* (Darmstadt: Wissenschaftliche Buchgesellschaft, 1994), p. 84.

objects cannot present themselves in perception as they are, bound as that is by the condition of the experiencing subject, but, beginning with experience, must be reconstructed in thought. Such reconstruction is the task of science. Not that it can ever be fully adequate to the objects themselves, which function only as a regulative ideal, but as such are indispensable. In the scientific pursuit of truth the regulative ideal of the truth of phenomena substitutes for the truth of things. God has been replaced with the transcendental subject, an idea implicit, as Kant recognized, in the pursuit of truth. Purified of the distortions brought about by the body's temporal and spatial location, the transcendental subject's "point of view" is that of all possible knowers. The other side of the thought of the transcendental subject is thus the regulative ideal of a truly objective understanding of reality. This leads to the demand that thinking free itself as much as possible from all dependence on particular points of view and from the perspectival distortions that are bound up with such dependence; allows us to demand objectivity. Given that demand, all those aspects of reality that presuppose a reference to some particular perspective have to be understood as mere appearance. This includes all secondary qualities, which are essentially tied to our senses and thus to what happens to be the constitution of the human body. As Galileo puts this in *The Assayer*:

Now I say that whenever I conceive any material or corporeal substance, I immediately feel the need to think of it as bounded and as having this or that shape; as being large or small in relation to other things, and in a specific place at a specific time; as being in motion or at rest; as touching or not touching some other body; and as being one in number, or few, or many. From these conditions I cannot separate such substance by any stretch of my imagination. But that it must be white or red, bitter or sweet, noisy or silent, and of sweet or foul odor, my mind does not feel compelled to bring in as necessary accompaniments. Without the senses as our guides, reason or imagination unaided would probably never arrive at qualities such as these. Hence I think that tastes, odors, colors, and so on are no more than mere names so far as the objects in which we place them is concerned, and that they reside only in the consciousness.²¹

Following Democritus, Galileo here anticipates Descartes' reflections on a piece of wax in the *Meditations*. We gain objective understanding only to the extent that sights and sounds yield to measurable shape and movement. The commitment to objectivity demands the mathematization of nature. Here we

²¹ *Discoveries and Opinions of Galileo*, trans. and intro. Stillman Drake (Garden City: Doubleday, 1957), p. 274.

have a key to Galileo's Platonism. This commitment also has to lead to a demand that language be purified as much as possible from everything that would bind it to particular perspectives, that ties it too closely to a particular natural language. Logic must be freed from grammar.²² The devaluation of rhetoric and metaphor is a corollary. So understood, all discourse that would serve the truth has to aspire to whiteness in the sense in which Jacques Derrida, following Anatole France, has spoken of the whiteness of metaphysics.²³ With an eye to Thomas Nagel we may want to speak instead of a view from nowhere.²⁴

3.

For Copernicus and Galileo the meaning of truth was inseparable from the thought of a timeless understanding, unburdened by perspective, where their faith in God supported their understanding of the truth of things. Was not God the author of the book of nature, as he was the author of the Bible? And did not God create us in his image, making us sufficiently godlike to be capable of reading and understanding that book?

But how are we to build a bridge across the abyss that separates our finite, perspective bound understanding from the truth of things. This much is certain: if the truth of our judgments is to have its measure in the truth of things, must they not disclose themselves to us in such a way that they can provide such measures? But how are we to think such disclosure? It is not surprising that Galileo, too, should have looked first of all to perception, claiming to be in profound agreement with Aristotle, so much so that he can charge those who continue to hold on to a geocentric cosmology with being less faithful to the Stagirite than he with his trust in the eye.

I should even think that in making the celestial material alterable, I contradict the doctrine of Aristotle much less than do those people who still want to keep the sky inalterable; for I am sure that he never took to be its inalterability as certain as the fact that all human reasoning must be placed second to direct experience.²⁵

²² Wittgenstein, *Tractatus* 4.003; see also Heidegger, *Die Lehre vom Urteil im Psychologismus* (Leipzig: Barth, 1914), pp. 99–101; reprinted in *Gesamtausgabe* (Frankfurt am Main: Klostermann, 1978), vol. 1, pp. 157–159.

²³ Jacques Derrida, "White Mythology: Metaphor in the Text of Philosophy," *Margins of Philosophy*, trans. Alan Bass (Chicago: Chicago University Press, 1982).

²⁴ See Thomas Nagel, *The View from Nowhere* (New York: Oxford University Press, 1986).

²⁵ *Discoveries and Opinions of Galileo*, p. 118.

In a letter to Kepler Galileo speaks of his colleagues at Padua, who, as he puts it, with the persistence of a snake, closed their eyes *contra veritatis lucem*, to the light of truth.²⁶ But Galileo knew better than to equate the light that allows us to see with the light of truth. He knew that while there is a sense in which reasoning must be placed second to direct experience, a distrust of such experience is a presupposition of the pursuit of truth. He could have cited the passage from Copernicus' *De revolutionibus* quoted above in support. Had Plato not shown long ago the evidence of direct experience to be inextricably bound by perspective, substituting appearance for reality? Galileo makes this point when he criticizes Sarsi in *The Assayer*:

Your Excellency will note the great confidence which Sarsi places in the sense of sight, deeming it impossible for us to be deceived by a spurious object whenever that may be placed besides a real one. I confess that I do not possess such a perfect faculty of discrimination. I am more like the monkey that firmly believed that he saw another monkey in the mirror, and the image seemed so real and alive to him that he discovered his error only after running behind the glass to catch the other monkey.²⁷

Before we can claim truth, we have to consider the perspectival distortions to which our position in space and time and the make-up of our senses subject us. But if direct perception does not secure access to the truth of things, how is such access to be gained? In *The Assayer* Galileo points to reason. Experience and experiment provide an indispensable ground, but what reason cannot help but ascribe to nature provides the key to the language science must speak if it is to claim truth.

In this respect, too, Galileo can claim to be faithful to the spirit of Copernicus. According to Copernicus there are at least these two conditions that must be met if we are to understand the propositions of a science as serious claimants to truth: 1. The hypotheses advanced by science must "save the appearances," i. e., they must agree with the best available observations. 2. They have to be arrived at by following a method based on principles that are certain (*certa principia*)²⁸ because supported by insight into the very essence of nature.

²⁶ Letter of August 10, 1610, in Galileo Galilei, *Opere*, 20 vols. ed. Antonio Favaro (1890–1909), cited in Hans Blumenberg, *Die Genesis der kopernikanischenWelt* (Frankfurt am Main: Suhrkamp, 1975), p. 763.

²⁷ *Discoveries and Opinions of Galileo*, p. 255.

²⁸ Nicolaus Copernicus, *De revolutionibus Orbium Coelestium*, "Proemium," in *Das Neue Weltbild. Drei Texte: Commentariolus, Brief gegen Werner, De revolutionibus I*, Lateinisch-deutsch, trans., ed., and intro. Hans Günter Zekl (Hamburg: Meiner, 1990), p. 72.

That the first condition cannot secure claims to truth Copernicus and Galileo knew very well. As Osiander was to put it in his phony preface to *De revolutionibus*: hypotheses that provide “a calculus consistent with the observations” need not be “true or even probable.”²⁹ So understood astronomy need not be concerned with truth, but should be content to save the appearances. That was the position the Church wanted Galileo to endorse. Pierre Duhem later was to agree with Osiander. And Husserl, as Patrick A. Heelan points out approvingly, had a similar understanding of Galilean science: “Mathematical models according to Husserl provide technical computational power but, of themselves, independently of the life-world, do not illuminate the things that comprise nature or provide the categories for natural objects.”³⁰ I shall have occasion to return to this point, which raises the question whether such a turn to the life-world will not substitute for objective truth some version of subjective truth.

What is clear is that Galileo did claim truth for his science and knew that Copernicus’ first condition is insufficient to secure such a claim, reason enough for him to dismiss Osiander’s preface. Copernicus, while he did not claim to have seized the truth once and for all, did indeed leave no doubt concerning his goal: to describe, as best he could, *mundi formam*, the true form of the world.³¹ And his commitment to objective truth made it important to Galileo that, when leaving his professorship of mathematics at the University of Padua to take up a position at the court of Cosimo Medici and a professorship at Pisa, his title be mathematician and philosopher. The censure of 1616, addressed to the mathematician, not the philosopher, makes clear what is at issue: consider the Consultants’ Report of February 24, 1616, which states that the propositions “The sun is the center of the world” and “The earth is not the center of the world” are “foolish and absurd in philosophy.”³² The importance of the word “philosophy” here is underscored by the authorization of the following day, warning “the mathematician Galileo” to abandon his opinions.³³ Eight days later Copernicus’ *On the Revolution of Spheres* and Galileo’s friend Foscarini’s *Letter on the Pythagorean and Copernican Opinion of*

²⁹ “Ad Lectorem De Hypothesibus Huius Operis”, in Nicolaus Copernicus, *Das neue Weltbild*, p. 62; trans. Edward Rosen, *Three Copernican Treatises, The Commentariolus of Copernicus, the Letter against Werner, The Narratio Prima of Rheticus*, 2nd ed. (New York: Dover, 1959), p. 25.

³⁰ Patrick A. Heelan, “Husserl, Hilbert, and the Critique of Galilean Science,” *Edmund Husserl and the Phenomenological Tradition*, ed. Robert Sokolowski (Washington: Catholic University Press, 1988), p. 162.

³¹ “Proemium,” p. 70.

³² Finocchiaro, *The Galileo Affair*, p. 146.

³³ *Ibid.*, p. 147.

the Earth's Motion are placed on the index of forbidden books. But at the time both the Church and Galileo seemed eager to avoid a confrontation and thus trouble. This is suggested by Cardinal Bellarmine's Certificate of May 26, 1616, declaring that Galileo had been notified that the doctrine that the sun is at the center of the world was contrary to Holy Scripture and could not be defended or held, but that, contrary to rumors that were being spread, he had not been asked to recant. The Church must have hoped that Galileo would be content with the part of a mathematician and not claim the mantle of a philosopher. But Galileo had to refuse that invitation. In a letter to Dini he states what was at stake:

I should not like to have great men think that I endorse the position of Copernicus only as an astronomical hypothesis, which is not really true. Taking me as one of those most addicted to this doctrine, they would believe all its other followers must agree, and that it is more likely erroneous than physically true. This, if I am not mistaken, would be an error.³⁴

Galileo is here concerned not only for the (physical) truth, but also for his reputation as its defender. Given his investment in that image, it was difficult to avoid collision with a Church that since the days of Copernicus, let alone those of Cusanus, had grown ever more conservative. It could not be reassured by a statement such as the following:

To me, the surest and swiftest way to prove that the position of Copernicus is not contrary to Scripture would be to give a host of proofs that it is true and that the contrary cannot be maintained at all; thus, since no two truths can contradict one another, this and the Bible must be perfectly harmonious.³⁵

Galileo knew of course that defenders of the tradition could point to many apparent contradictions. The Bible does seem to assume a geocentric cosmology. According to Galileo, and Pope John Paul II was to endorse such conviction, such "contradictions" can only be apparent, due either to deficient science or deficient theology:

In regard to falsifying Scripture, this is not and will never be the intention of Catholic philosophers such as ourselves; rather our view is that Scripture corresponds very well to truths demonstrated about nature.

³⁴ *Ibid.*, p. 167.

³⁵ *Ibid.*, p. 166.

Moreover, certain theologians who are not astronomers should be careful about falsifying Scripture by wanting to interpret it as opposed to propositions that may be true and demonstrable.³⁶

The implications are clear: science is capable of the truth. As a Catholic astronomer, Galileo is also prepared to grant the truth of Scripture, but he is not willing to grant that its interpreters have grasped that truth.

It might happen that we could have difficulties in interpreting Scripture, but this would occur because of our ignorance and not because there are really insuperable difficulties in reconciling Scripture with demonstrated truths.³⁷

The tables have been turned: while the theologians insisted that the truth claims of science be brought in accord with Scripture, now their interpretations of Scripture are to be brought in accord with what science has to tell us. The natural philosopher, who relies only on experience and reason, rather than the theologian, who relies on Holy Scripture, tradition, and reason illuminated by faith and grace, has become the privileged custodian of truth.

Galileo's distinction between the real, although perhaps still undiscovered meaning of Scripture, which is taken to be in principle compatible with the new science, and its apparent meaning, which may well be incompatible, makes Scripture an uncertain guide to truth. How can we be sure that we have gotten hold of the real meaning of the Scriptural text and not just of an all too human and therefore fallible interpretation? Such questioning invites skepticism in matters of religion going far beyond the matter at hand. Just as we cannot trust the seemingly direct evidence of the eyes, we cannot trust the seemingly direct evidence of the Biblical text. Protestant appeals to God's Word as a solid base for genuine Christianity invite anarchy and skepticism, just as do appeals to direct perception. In both cases more is needed to secure claims to truth.

Against such skepticism the Counter-Reformation insisted on the authority of tradition. Appealing to the Council of Trent Bellarmine thus points out in a letter to Foscarini that that "Council prohibits interpreting Scripture against the common consensus of the Holy Fathers," supported by "the modern commentaries on Genesis, the Psalms, Ecclesiastes, and Joshua."³⁸ According to the cardinal it is this continuing community of interpreters guided

³⁶ *Ibid.*, p. 83.

³⁷ *Ibid.*, pp. 83–84.

³⁸ *Ibid.*, p. 68.

by the Holy Spirit that must be considered the guardian of truth. Bellarmine here presents us with a version of a consensus theory of truth. Hermann Lübbe speaks of “consensus objectivity” (*Konsensobjektivität*).³⁹

But such objectivity, based on an intersubjectively acceptable reading of Scripture, is relative to the Church, an ever evolving establishment, and must therefore be distinguished from the kind of scientific objectivity insisted on by Galileo and his successors. The facts, they insist, are what they are, regardless of what human beings may think.

If the earth de facto moves, we cannot change nature and arrange for it not to move. But we can rather easily remove the opposition of Scripture with the mere admission that we do not grasp its true meaning. Therefore the way to be sure not to err is to begin with astronomical and physical considerations, and not with scriptural ones.⁴⁰

The truths of science are available to any unprejudiced inquirer. Experience and reason provide sufficient guidance. And in his defense Galileo could have reminded the Inquisitors that it was to Pope Paul III, who called the Council of Trent, that Copernicus dedicated *De revolutionibus* with words that left no doubt about the capability of human reason to grasp the truth. Was it not that Council that insisted, against the Protestants’ cognitive pessimism, that original sin, while no doubt it had damaged reason and will, had not corrupted them so completely that sound judgment was now beyond our reach. The Council thus gave new legitimacy to a Christian humanism. As did Copernicus, Galileo understood himself to be such a humanist. Our reason testifies to our creation in the image of God. To be true to itself, reason cannot sacrifice what it has recognized to be true to the authority of tradition. This does not mean that the inquirer should not be open to the challenges presented by others. Kant knew that the pursuit of truth demands a willingness to test our judgments by the judgments of others and criticizes the “logical egoist” who claims not to need this *criterium veritatis externum*.⁴¹ But this is an external criterion. The meaning of truth may not be sought in such a consensus, which provides hardly an adequate criterion. Objective truth is what it is, and transcends whatever particular human beings may hold to be true. That truth is made by Galileo the measure of all other claimants to the truth, and that includes theologians.

³⁹ See Hermann Lübbe, “Die Identitätspräsentationsfunktion der Historie,” in *Praxis der Philosophie, Praktische Philosophie, Geschichtsphilosophie* (Stuttgart: Reclam, 1978), pp. 97–122.

⁴⁰ Finocchiaro, *The Galileo Affair*, p. 82.

⁴¹ Kant, *Anthropologie*, BA 6.

But this does not answer the question: how does reason lead us from phenomena to the truth of things? What allowed Galileo to claim the mantle of the philosopher?

4.

Defending his claim to be not just another astronomer content to offer calculations that would save the phenomena, Galileo in his “Notes on the Copernican Opinion” appeals to Ptolemy in support of his claim that from the very beginning astronomers have also been philosophers:

Astronomers have so far made two sorts of suppositions: some are primary and pertain to the absolute truth of nature; others are secondary and are imagined in order to account for the appearances of stellar motions, which appearances seem not to agree with the primary and true assumptions. For example, before trying to account for the appearances, acting not as a pure astronomer, but as a pure philosopher, Ptolemy supposes, indeed he takes from philosophers, that celestial movements are all circular and regular, namely uniform; that heaven has a spherical shape; that the earth is at the center of the celestial sphere, is spherical, motionless, etc. ... Turning then to the secondary inequalities we see in planetary movements and distances, which seem to clash with the primary physical suppositions already established, he goes on to another sort of suppositions. ... This secondary supposition is the one of which it could be said that the astronomer supposes it to facilitate his computations, without committing himself to maintaining that it is true in reality and in nature.⁴²

The first kind of supposition claims absolute truth, as Ptolemy did, when he endorsed the Platonic axiom that the motion of the heavenly bodies is circular and uniform and placed the earth at the center of the spherical cosmos. In all of this, as it turned out, he was mistaken. Unwittingly he substituted for truth the appearance of truth. But that does not change the meaning of what he claimed. He asserted it to be “true in reality and in nature” and in support he could appeal to Aristotle’s metaphysics of nature.

Galileo would have us understand Copernicus in the image of Ptolemy. To be sure, Copernicus assigns the central place to the sun and claims that the earth moves. But “the earth’s motion and the sun’s stability,” Galileo insists, must be understood as “primary and necessary suppositions about na-

⁴² Finocchiaro, *The Galileo Affair*, pp. 75–76 .

ture,” claiming absolute truth, where the comparison with Ptolemy has to raise the question whether Copernicus, too, did not substitute the appearance of truth for truth. But is Galileo right here? Did Copernicus consider the earth’s motion and the sun’s stability primary truths? If so, he could not have appealed to an available metaphysics of nature for support. Nor did he attempt to furnish such a metaphysics, although we are given at least the trace of such a metaphysics with the Platonic axiom, which he retains. But that does little more than prescribe a certain mathematical form.

Galileo’s distinction between primary and secondary suppositions can be supported by citing Ptolemy’s *Almagest*: “We know, finally that some variety in the type of hypotheses associated with the circles [of the planets] cannot plausibly be considered strange or contrary to reason ...; for, when uniform circular motion is preserved for all without exception, the individual phenomena are demonstrated in accordance with a principle which is more basic and more generally applicable than that of similarity of the hypotheses [for all planets].” If hypotheses are not to be considered “strange or contrary to reason,” they must accord with some more basic principle. But is such conformity to human reason sufficient to secure claims to what Galileo terms physical truth? Does it not threaten to make what such hypotheses assert relative to what human beings are able to comprehend?

Copernicus was to appropriate Ptolemy’s claim that individual phenomena need to be demonstrated in accordance with some basic principle. And like Galileo he was convinced that if an astronomer’s hypotheses were to warrant a claim of truth they had to be not just in accord with reason but based on *certa principia*. But Copernicus did not include heliocentrism among these certain principles. That the sun is at the center of the cosmos had to be demonstrated rather than presupposed. Copernicus does presuppose the Platonic axiom, which, he points out, was granted, by all his precursors, and is expressed in the title of Chapter Four of *De revolutionibus*. Copernicus presupposes its validity when he criticizes the speculations of his predecessors for not having been either “sufficiently absolute” (*satis absoluta*) or “sufficiently in agreement with reason” (*rationi satis concinna*).⁴³ One argument against the Ptolemaic system is that it violated the requirement of uniformity.

But the question returns: is conformity to human reason, as expressed in the Platonic axiom, sufficient to secure claims to the truth of things? Galileo, retaining this axiom, was convinced that there was no abyss that separated human from divine reason. God created us in his image so that we might read in the book of nature.

⁴³ *Commentariolus*, in Copernicus, *Das neue Weltbild*, p. 4.

Philosophy is written in this grand book, the universe, which stands continually open to our gaze. But the book cannot be understood unless one first learns to comprehend such language and read the letters in which it is composed. It is written in the language of mathematics and its characters are triangles, circles, and other geometric figures without which it is humanly impossible to understand a single word of it; without these, one wanders as in a dark labyrinth.⁴⁴

Long ago Plato had suggested this way out of the labyrinth: “And the arts of measuring and numbering and weighing come to the rescue of the human understanding – there is the beauty of them – and the apparent greater or less, or more or heavier, no longer have mastery over us, but give way before calculation and measure and weight?”⁴⁵ But unlike Galileo, Plato did not think that philosophy was written in nature. According to him it was written in the minds of men.⁴⁶ Within itself the mind finds access to the invisible cosmos of the ideas. To be sure, the material world is informed by the forms – think of the creation account in the *Timaeus* – but it also always offers a certain resistance to such formation. Plato thus thinks in terms of the opposition of matter and form. But the Biblical God is omnipotent: there can be nothing outside the creator’s power. Galileo’s claim that nature is a book written in the language of mathematics is thus just as much a Christian as a Platonic thought, although such a Christian Platonism also has to bring to mind Pythagoras. According to this Christian Platonism mathematics allows us to understand the very essence of nature.

But the core of Galileo’s claim does not depend on the Christian God. Kant’s transcendental subject is sufficient to legitimate the mathematization of nature demanded by Galileo. There is, however, this important difference: Kant would point out that nature so understood may not be equated with things in themselves; the truth of phenomena now substitutes for the truth of things. According to Kant such a substitution is demanded by the scientific pursuit of truth, which thus demands a certain cognitive resignation. Such a distinction between phenomena and things in themselves is foreign to Galileo. But, as Nietzsche recognized, its elision has to lead to nihilism, reason enough to revisit Pope John Paul II’s praise of Galileo’s understanding of the relationship of science and religion.

⁴⁴ Galileo, *The Assayer*, in *Discoveries and Opinions of Galileo*, pp. 237–238.

⁴⁵ Plato, *Republic*, X, 602 c-d, trans. Benjamin Jowett.

⁴⁶ Cassirer, “Galileo’s Platonism,” *Studies and Essays in the History of Science and Learning in Honor of George Sarton* (New York: Schumann, 1946), pp. 277–297.

5.

Kant had good reason to want to distinguish phenomena from things in themselves and to insist that what science pursues is the truth of phenomena. What is at stake is hinted at by Patrick Heelan when he agrees with Husserl that mathematical models, while they may provide computational power, “do not illuminate the things that comprise nature or provide the categories for natural objects.” Heelan speaks of the “objectivism” of Galilean science. “Objectivism implies that the description provided by scientific theory (and its mathematical model) ought for the purposes of philosophy to replace the language of the direct experience of the life world.”⁴⁷ I have argued here that scientific theory ought to replace the language of the direct experience of the life world to the extent that such theory is the pursuit of the truth of the phenomena that make up nature. Can a different meaning be given to the truth of things? No doubt, but, I would claim, only at the price of objectivity.

As Kant recognized, there is a sense in which nature or reality is elided by the very pursuit of objective truth. Such an elision is inscribed into the conception of reality or the metaphysics of nature that is presupposed by science, as inaugurated by Copernicus and Galileo. Science aims at a perspicuous representation of the world that ideally would include everything that deserves to be called real. In the *Tractatus* Wittgenstein offers us this example:

6.341 Newtonian mechanics ... brings the description of the universe to a unified form. Let us imagine a white surface with irregular black spots. We now say: Whatever kind of picture these make I can always get as near as I like to its description, if I cover the surface with a sufficiently fine square network and now say of every square that it is white or black. In this way I shall have brought the description of the surface to a unified form. This form is arbitrary, because I could have applied with equal success a net with a triangular or hexagonal mesh. It can happen that the description would have been simpler with the aid of a triangular mesh; that is to say, we might have described the surface more accurately with a triangular, and coarser, than with the finer square mesh, or vice versa, and so on. To the different networks correspond different systems of describing the world. Mechanics determine a form of description by saying: All propositions in the description of the world must be obtained in a given way from a number of given

⁴⁷ Heelan, p. 159.

propositions – the mechanical axioms. It thus provides the bricks for the building of the edifice of science, and says: Whatever building thou wouldst erect, thou shalt construct it in some manner with these bricks and these alone.

Reality is here pictured as a page bearing irregular black spots. Science covers this picture with a network and proceeds to represent the original picture by filling in the proper areas, where we should keep in mind what is sacrificed here for ease of representation: the irregularity of the black spots which stand here for what disinterested, unprejudiced observation determines to be the case. By its very project, science so understood tends to elide reality, tends to mistake reality for what it can represent. And it is therefore not surprising that in the *Tractatus* Wittgenstein himself should elide that rift between reality and its scientific representation to which his own picture calls our attention, when he identifies the world with the facts in logical space (1.13), instead of being content with the more modest formulation: the scientific world-picture represents nature in logical space (cf. 2.11).

Wittgenstein's scientist is a builder who uses for his building-blocks thoughts or propositions. That such objectification has to transform that reality in which we find ourselves first of all and most of the time is evident: our first access to reality is always bound to particular perspectives, mediated by our bodies, colored by our concerns and interests. But as soon as we understand a perspective as such, in thought at least we are already beyond the limits it would impose. Such reflection on perspective and point of view leads inevitably to the idea of a subject that, free of all perspectives, understands things as they really are. And it leads with equal necessity to the thought that the reality that gives itself to our eyes, and more generally to our senses, is the mere appearance of an objective reality no eye can see, no sense can sense, that only a rational thinking can attempt to reconstruct.

The pursuit of truth demands objectivity. And objectivity demands that we not allow our understanding to be clouded by our inevitably personal desires and interests. It wants just the facts. With good reason Wittgenstein could therefore say: "In the world everything is as it is and happens as it does happen. In it there is no value – and if there were, it would be of no value" (6.41). It would be just another fact that, like all facts, could be other than it happens to be. If there is something that deserves to be called a value, it will not be found in the world of science. To find it we have to step outside that world. And the same goes for freedom. That means that persons as persons are not part of the scientific world picture. They are ruled out by the form of representation that governs it. This is why Nietzsche can say, stone is more

stone than it used to be.⁴⁸ Matter has become just a mute given that happens to be that way.

But is this not to say that whatever makes life meaningful must be sought outside the reality known to science? Heidegger makes this elision of meaningful reality a defining feature of our age, of what he calls the “Age of the World Picture”: “When we think of a ‘picture’ we think first of all of a representation of something. Accordingly the world-picture would be, so to speak, a picture of what is in its entirety. But ‘world-picture’ says more. We mean by this term the world itself, what is in its entirety, as it measures and binds us.”⁴⁹ To the world so understood we, too, belong, for it is said to include all that is. The world-picture thus transforms itself into something like a house, into a building, in which we, too, have our place. If this world-picture is to include all that is, it cannot have an outside. But this means the loss of what Kant calls things in themselves, and every time we experience a person as a person we experience such a thing in itself. There is no experience of persons without at least a trace of respect. In this sense we can agree with Kierkegaard that subjective truth is higher than objective truth, where we must resist the temptation to translate such subjective truth into some version of objective truth, as phenomenology so often has attempted to do. To the extent that the modern world is indeed what Heidegger calls “the age of the world-picture” it has become a prison that denies us access to the reality of persons and things. To experience the aura of the real that gives to persons and things their proper weight we have to escape from that prison, have to open a door, or at least a window in the world building scientific understanding has raised, a window to the truth of things, but now “truth” may no longer be understood as objective truth. The Church was thus right to deny that the truth that mattered to faith, and we can extend the point and, following Kierkegaard, say the truth that matters to existing individuals, should take second place to the truth that matters to science. But the Church was wrong to think that the truth that matters to faith be understood as objective truth. Copernicus and Galileo put the pursuit of objective truth on the right track. But just because they did, it remains important to consider both the legitimacy and the limits of that pursuit.

⁴⁸ Nietzsche, *Menschliches, Allzumenschliches*, I, 218, *Kritische Studienausgabe*, vol. 2, p.p. 178–179.

⁴⁹ Martin Heidegger, “Die Zeit des Weltbildes,” in *Holzwege, Gesamtausgabe*, vol. 5 (Frankfurt am Main: Klostermann, 1977), p. 89.