COMMON to all the major Western religious traditions is a sacred Book, a text that speaks with the authority of God.* The Book is a source of truth for believers who must, then, decide how it relates to the other more workaday source of truth that lies within the human abilities of sense and reason. How are the two to be harmonized? If they appear to diverge, which takes precedence? The sacred book contains God’s Word. But it is written in human language, by human authors. How, then, is the meaning intended by God to be discerned in it? And under whose authority is the authentic interpretation of the Word to be certified? This knot of hermeneutic and theological issues posed a challenge to theologians in all three of the major traditions, Jewish, Christian, and Moslem, as these traditions matured.

My concern here is with just one of those traditions, the Christian one, and specifically with two significant moments in the history of Christian efforts to harmonize the two sources of truth, or the two “Books,” as they came to be called. These moments are associated with two very diverse figures, each commanding a towering reputation and a continuing influence in his own domain, Augustine of Hippo in theology and Galileo Galilei in natural science. The presence of Augustine in any account of the history of Scriptural hermeneutics is to be expected. But Galileo? Yet, as we shall see, Galileo was preoccupied for a substantial part of his professional career with an urgent hermeneutic issue regarding the orthodoxy, from the standpoint of the Christian Scriptures, of the Copernican system his telescopic discoveries had led him to advocate. The work he composed, the celebrated Letter to the Grand Duchess Christina (1615), drew heavily on the authority of Augustine, who in his day had faced, in some respects at least, a similar challenge. But though the hermeneutic principles proposed by the two authors were very similar, their intellectual, professional, and political contexts were entirely different. This may help to explain why Augustine’s account of how apparent conflict between Scripture and the claims of natural science ought be reconciled went unchallenged, while Galileo’s was, in effect, summarily rejected. And this rejection was to have disastrous consequences for himself and in the longer run for the Church whose authorities in 1616 declared that the new-fangled Copernican system was “contrary to Scripture.”!
1. Augustine: The De Genesi ad litteram

First, then, to Augustine. Augustine went through two conversions, the first from the traditional Christianity of his childhood to the fashionable Manichaeism that had, some time before, swept through the Mediterranean world, and the second conversion, back to Christianity again, now professed as a reflective and confident choice. The Manichaeans mocked the Christian Scriptures as primitive and incoherent and offered an entirely different account of cosmic and human origins. The Creator pictured in Genesis they saw as impossibly anthropomorphic, and the notion of creation itself left no room for the great struggle between the rival forces of Good and Evil that they saw everywhere in evidence around them.

Augustine, as a Manichaean, would have known the force of their criticisms of Genesis. Not surprisingly, then, the task of responding to them was one of the first he took on as a Christian convert, even before he was ordained priest. The task, he discovered, was not going to be an easy one. Indeed, it was one to which he returned again and again throughout the course of his immensely productive life. The focus would be the Book of Genesis, the principal target of the Manichaean attack. How was it to be understood? In particular, could it be taken in a literal, historical, sense or ought it to be read in some more figurative way? His first attempt to answer this question, crucial to the Manichaean challenge, was his De Genesi contra Manichaeos libri duo (A Commentary on Genesis against the Manichaeans in Two Books), c. 388 A.D. He later remarked about this youthful work that as he attempted to find a credible literal interpretation of the first chapters of Genesis describing the Creation, he found the task nearly impossible. A few years later, he tried again but gave up, leaving the work incomplete, though he decided to preserve the manuscript; this was the De Genesi ad litteram imperfectus liber (The Literal Meaning of Genesis: An Unfinished Book). Again in books 12 and 13 of his Confessions (391–401 A.D.), he attempted to give both a literal and an allegorical interpretation for the first chapter of Genesis.

*This essay is dedicated to Richard Blackwell, whose work on Galileo — particularly his book, Galileo, Bellarmine, and the Bible — has been of inestimable service to Galileo scholarship.

1I take up this latter issue at much greater length in “Galileo on science and Scripture,” in The Cambridge Companion to Galileo, ed. Peter Machamer (Cambridge University Press, 1998, 271–347). In particular, the complexities of the events of 1613–1615, the crucial phase of the so-called “Galileo affair,” are laid out there in considerable detail.


3Retractiones, 2.50 (text in Appendix I to the Taylor translation of LMG).


5See John J. O’Meara, “Augustine, literal and scientific: His interpretation of Genesis on Creation,” in Understanding Augustine (Dublin: Four Courts, 1997), 109–119. It is remarkable, as O’Meara points out, how very little attention has been paid to the Genesis commentaries of Augustine by contemporary exegetes.
At this point, however, he evidently decided that he was now ready for the full-scale work that was clearly called for. The *De Genesi ad litteram* (*The Literal Meaning of Genesis*) would take him fourteen years (401–415 A.D.) and was one of his major works. He was still not entirely satisfied, however, remarking that in his effort to find the “proper historical sense” of the enigmatic chapters, he had found more questions than answers, “and of the answers found, not many have been established for certain.” He returned to the topic one last time in his great *City of God*. This long effort, extending through much of his life, must have convinced him, if any convincing was needed, that the discovery of the literal meaning of Scripture could be an exceedingly difficult matter, and that this difficulty would be heightened where there was an apparent conflict between this literal sense and some finding of “sense or reason,” as the Manichaeans claimed regarding many passages in the Creation chapters of *Genesis*.

I have used the expression “literal meaning” above as though it were unproblematic. But, unfortunately, that is far from the case. When we use that phrase today, it is usually to contrast the “literal” meaning of some expression with a metaphorical one. But interpreting a text “*ad litteram*” (according to the letter) meant something much broader in Augustine’s day, and indeed exegetes have been at pains to point out that Augustine himself used the phrase in different ways in different contexts, ranging from a usage not unlike the modern one, especially in his earlier works on *Genesis*, to “a highly sophisticated interpretation that is quite metaphysical and not what we would ordinarily call the literal sense” in the *De Genesi ad litteram*.

John Taylor takes Augustine to mean primarily by “literal”: the sense intended by the author, which could well be metaphorical. (One would then need to specify whether God or the human author is in question.) Its primary sense for Augustine may well have been the negative one, meaning simply: not allegorical. In the case of historical narrative (and Augustine, unlike the neo-Platonists of his day, was quite firm in holding that the *Genesis* story of creation was historical), the sense of “literal” that comes closest to his usage might be: conveying the historical fact, telling us what actually happened. What complicates matters, of course, is that the language in which God’s action in creating the world is described cannot possibly, in the nature of the case, be literal in the modern sense of that term. So we have to be content with a “literal meaning of *Genesis*” which aims to be “literal-historical,” but makes no effort to be literal in the usual sense.

Long before Augustine’s day, two rather different schools had formed regarding the proper interpretive approach to Scripture. The School of Alexandria, whose most notable members were Origen, Clement, and Cyril,
favored a highly allegorical interpretation of the Old Testament, seeing it as pre­figuring the New. The allegorical meaning was not the intended meaning of the human author, nor was it what the first readers would have seen in the text. Rather, it was the meaning intended by God for later readers who would grasp in this way the deeper coherence of the story of human salvation. The school of Antioch (John Chrysostom, Theodore of Mopsuestia, Theodoret of Cyr), less influential, preferred a more literal and historical reading, avoiding the imagina­tive flights of the Alexandrians.

Augustine was thoroughly familiar with this rich literature. In general, he took the middle ground, seeking first the literal or “proper” sense, and then where appropriate an allegorical (or figurative or prophetic) sense. In the De Genesi ad litteram, Augustine’s imagination soars as he reads the six days of the Creation narrative not as days in the ordinary sense (how could they be since, as the Manichaeans had objected, the sun was not made until the fourth “day”?), but as progressions in angelic knowledge.

This interpretation of the text, he insists, is still a “literal,” not an allegorical, one. Even though it differs from our ordinary understanding of the term “day,” it is a “truer” deeper sense, of which our ordinary sense is an echo.7 He acknowledges, however, that others may find a different meaning here and encourages the search. Indeed, he remarks, he may himself still hit on another, and more plausible, interpretation. Interpretive though it may be, however, this is still for him the “literal” sense, that which the text tells us actually happened. What prompts the search for alternatives here is that the normal sense of the term “day” cannot be correct. This is the unequivocal testimonial of human reason and the human senses. In the circumstances, another interpretation of Scripture must be found.

We are now ready to look more closely at the text of the De Genesi. How does Augustine deal with apparent conflicts of this sort between the findings of sense and reason and the literal reading (in our sense of that term, i.e. where the component words are taken in their normal usage) of particular Scriptural texts? Since he nowhere provides a systematic answer to this question, we have to examine those passages in his commentary where he is dealing with this issue and see what he has to say about the principles that guide him in each case. We may in this way be able to formulate a set of hermeneutic guidelines, covering apparent conflicts while keeping in mind that we are imposing system on a context to which it is foreign. Augustine sets down these maxims usually without supporting argument, as though they would be obvious to his readers.

First, he takes for granted throughout the work that both Scripture and human reason are sources of truth; both come from God. They cannot, therefore, truly conflict. If they appear to, this can only be because one or other has been misun-

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6LMG, I, 4, 28. 7LMG, II, 9, 21. 8Ibid. Emphasis mine. 9LMG, I, 21, 41. The translation here is my own.
understood or its claim to truth overstated. This might be called:

The Principle of Non-Contradiction (PNC): The proper meaning of Scripture cannot be in true conflict with the findings of human sense or reason.

What one should ask, then, when an apparent conflict arises is how secure the claim on the side of the senses or the reason really is:

But someone may ask: “Is not Scripture opposed to those who hold that the heavens are spherical, when it says [of God] ‘who stretches out the heavens like a skin’?” Let it be opposed indeed, if what they say is false. The truth is rather in what God reveals than in what groping men surmise (humana infirmitas conicit). But if they are able to establish their doctrine with proofs that cannot be denied (si forte illud talibus illi documentis probare potuerint. ut dubitari inde non debet), we must show that this statement of Scripture about the skin is not opposed to the truth of their conclusions.7

“Proofs that cannot be denied” — a demanding condition. And Augustine repeats it, for good measure; the Scriptural passages about the shape of the heavens (stretched out like a skin; suspended like a vault) must be shown “not to contradict the theories that may be supported by true evidence, by which heaven is said to be curved on all sides in the shape of a sphere, provided only that this is proved.”8 He is not entirely convinced that the spherical shape has been proved — “it may be only a man-made theory” — but he evidently thinks that it comes close enough that another interpretation of the stretched skin should be sought. And it ought not be allegorical, else a “literal-minded interpreter” will remind him that a variant literal interpretation ought also be forthcoming. And indeed one is: Why should the skin not be stretched in a spherical shape? After all, he says, with just a trace of complacency, “a leather bottle and an inflated ball are both made of skin.”

Augustine has enough confidence in human reason, then, to allow him require as a constraint on Scriptural interpretation:

The Principle of Priority of Demonstration (PPD): When there is a conflict between a proven truth about the physical world and a particular reading of Scripture, an alternative reading should be sought.

His general approach in the De Genesi is to retort to the Manichaean critics of Scripture that whatever they “could demonstrate about the nature of things by means of reliable evidence (quidquid ipsi de natura rerum veracibus documentis demonstrare potuerint), we shall show that it is not contrary to our Scripture.”9 He adds a caveat, however. If the Manichaean “produce from their books” something that is (definitely) contrary to the Catholic faith,10 “we shall either by some means or

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other show, or else without a shadow of doubt believe, that it is absolutely false.”

His long struggle with the *Genesis* text had brought home to him how obscure the text of Scripture could be. It is this that allows him to propose the priority of demonstrated truths in the natural order; given the multiplicity of alternative possible “literal” interpretations of at least some Biblical texts, PPD simply helps the reader to narrow the field of permissible interpretations when searching for the genuine “literal” one, the one that conveys the historical truth. But not all texts are open in this way to multiple interpretations. If a truth of faith is clearly involved, no alternative interpretations may in fact be permissible; in that case, PPD is suspended, and the arrow of doubt is directed back, rather, to the claim of demonstration.

Texts such as these suggest a further principle, though Augustine never makes it quite explicit. Suppose the warrant for the conflicting claim about “the nature of things” is *not* decisive; suppose a “proof that cannot be denied” is lacking. In that case, Augustine seems to imply, the “given” interpretation of the Scripture passage should stand; there is not, in this case, a sufficient reason to allow a claim to natural knowledge to influence decision as to the proper reading of Scripture. Echoing a theme that sounds often in his work, he says in the first passage cited above: “The truth is rather in what God reveals rather than in what groping men surmise.” All of our knowledge owes to Divine illumination, but the illumination of Scripture is intrinsically of a higher order. Thus:

*The Principle of Priority of Scripture* (PPS): Where there is an apparent conflict between a Scripture passage and an assertion about the natural world grounded on sense or reason, the normal meaning of the Scripture passage should prevail as long as the latter assertion falls short of proof.

10The actual phrase is “something contrary to Scripture, that is (id est), contrary to the Catholic faith.” Augustine has introduced a new consideration here, after all the talk of readings that are “contrary to Scripture.” I take it that the second phrase “contrary to the Catholic faith,” where the issue of multiple interpretation should not arise, is the one to be emphasized in this context.

11 O’Meara draws attention to a variant reading here: “we should either indicate a solution [showing that the conflict is only apparent] or believe without hesitation that it is false” (O’Meara, “Augustine, literal and scientific,” 115).

12 O’Meara reads this passage to mean that in this second case, it is “question of a fact not scientifically established but of a scientific hypothesis” so that “the onus is on the theologian to show that the hypothesis is false” (ibid.). Perhaps this may have been what Augustine had in mind, but the contrast between an established truth about nature and a “scientific hypothesis” is nowhere made explicit in the text. In indirect support of this reading, perhaps, is Augustine’s closing comments in this passage: “Thus we shall not be led astray by the eloquence of false philosophy or the superstition of false religion.” This would imply that the claim advanced in this second case on the side of natural knowledge, being prompted by false philosophy or false religion, is in reality no more than a hypothesis.

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14 *LMG, V, 6, 19.*

15 *LMG, II, 16, 33.* This, as we shall see, was the only one of the passages cited here from Augustine that Galileo missed — oddly, since this text above all the others would have supported his argument that the movement of the sun and the immobility of the earth are only what appears “to the eyes of men on earth.”

16 *LMG, II, 9, 20.*
Another principle is more explicitly presented, one to which Augustine fre­quentially resorts in his Scripture commentaries: “Sacred Scripture in its customary style is speaking within the limitations of human language in addressing men of limited understanding, while at the same time teaching a lesson to be understood by the reader who is able.”

Or again: “We must hold to the pronouncement of St. Paul that . . . ‘star differs from star in glory [brightness].’ But, of course, one may reply, without attacking St. Paul: ‘they differ in glory to the eyes of men on earth.’”

Long before Augustine, theologians had been at pains to point out that the authors of Scripture had to accommodate their expressions to their prospective audience. Sometimes this would be because of the inadequacy of human language to convey their message, as when they describe God in anthropomorphic terms. At other times, as here, it might be because of the limitations of human ways of knowing. Both sorts of accommodation could be important in the interpreting of the Genesis narrative of the Creation. Hence:

The Principle of Accommodation (PA): The choice of language in the Scriptural writings may be accommodated to the capacities of the intended audience.

Several times in his commentary on Genesis, when Augustine encounters moderately technical issues regarding the make-up of the natural world, he betrays some impatience. This is not what they should be looking for in the Scriptures, he reminds his readers. Regarding the shape of the heavens, for example, the writers of Scripture gave it no special attention:

Such subjects are of no profit to those who seek beatitude, and what is worse, they take up precious time that ought to be given to what is spiritually beneficial. What concern is it of mine whether heaven is like a sphere and the earth is enclosed by it and suspended in the middle of the universe, or whether heaven, like a disk above the earth, covers it on one side? . . . I must say briefly that in the matter of the shape of the heaven, the sacred writers knew the truth but the Spirit of God, who spoke through them, did not wish to teach men such things as would be of no avail for their salvation.

Augustine is irritated with those who seek detailed knowledge of the natural world in Scripture: “There is a great deal of subtle and learned inquiry into these questions for the purpose of arriving at a true view of the matter; but I have no further time to go into these questions and discuss them, nor should they have time whom I wish to see instructed for their salvation.”

There are hints here, at least, of a quite strong principle bearing on the relevance of Scripture to natural knowledge:

The Principle of Limitation (PL): Since the primary concern of Scripture
is with human salvation, we should not look to Scripture for knowledge of the natural world. Augustine is admonishing his readers that the issue of salvation far outweighs the mere desire for natural knowledge.

The Manichaeans had been especially critical of the Genesis account of the placing of the waters both below and above the firmament, “and God called the firmament heaven.” Surely the natural place of water is below the heavens, they argued. Here Augustine stood fast, however, insisting on the truth of the Scripture passage, quite literally interpreted. It would not be enough, he remarked, to respond by saying that God could, by way of miracle, place waters wherever God wishes. The issue is about the natural place of water, and the Genesis text plainly says that water has a natural place both above and below the heavens. After some discussion, he relays an ingenious (if highly speculative) suggestion. The farthest planet, Saturn, has the longest path to run and rapid motion causes heat. Yet Saturn is also said to be the coldest star. “Some of our scholars,” he says, conclude that Saturn must be cooled by waters in the form of ice, far above the firmament. “But whatever the nature of that water and whatever the manner of its being there, we must not doubt that it exists in that place. The authority of Scripture in this matter is greater than all human ingenuity.”

Is it because the Genesis text is so plain that Augustine is adamant in maintaining the normal sense of the expression, “above the heavens (sky)” ? There is almost warrant here for a Principle of Clear Sense (PCS), which would say that if the sense of Scripture is clear and unambiguous, one should defend it at all costs, on the assumption, more or less symmetrical with PPD, that in such a case there would have to be some other way of construing the apparently conflicting claim of natural knowledge. Yet in the following passage he goes on to discuss a very similar text in Psalms: “(God) established the earth above the water.” It seems almost as plain as the earlier text, yet Augustine treats it quite differently. Here he gives the secular claim priority, and allows himself to fall back on a figurative meaning. This Scripture passage ought not, he warns, be used against these people who engage in learned discussions about the weights of the elements. They are not bound by the authority of our Bible, and, ignorant of the sense of these words, they will more readily scorn our sacred books than disavow the knowledge they have acquired by unassailable arguments or proved by the evidence of experience. Plain though the sense of the Scripture passage may be, PPD is invoked on the other side and is not to be gainsaid. For someone who might still insist on a literal

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16LMG, II, 10, 23.
17Genesis, I; 6–8.
18LMG, II, 1, 2
20Psalms, 135:6
21LMG, II, 1, 4. Emphasis mine.
22LMG, II, 18. Translation of the Latin phrase above is mine.
interpretation of the Scripture passage, he has this to offer: Are there not “promontories that tower over the water” of the seas?

Even the most casual reader of the De Genesi could hardly miss another principle, this time a second-order one, not a hermeneutic maxim guiding interpretation directly like the others above. In the passage just quoted, he warns Christian readers of the Bible against advancing an interpretation that has not been adequately thought through lest it should lead non-Christians who know better, to “scorn our sacred books.” He returns to this theme over and over:

In matters that are obscure and far beyond our vision, even in such as we may find treated in Holy Scripture, different interpretations are sometimes possible without prejudice to the faith we have received. In such a case we should not rush in headlong and so firmly take a stand on one side that, if further progress in the search for truth (diligentius discussa veritas) justly undermines this position, we too fall with it. That would be to battle not for the teaching of Holy Scripture but for our own, wishing its teaching to conform to ours, whereas we ought to wish ours to conform to that of Holy Scripture.

Such imprudent readers ought keep in mind two imperative reasons for caution. First, the matters dealt with in Scripture are far beyond our vision and the text is, in consequence, often open to multiple interpretations. And from the side of natural knowledge, there is also a sobering possibility that further progress in the search for truth may establish a position that would undermine an incautious earlier claim to interpret Scripture in a contrary sense. Again:

We should always observe that restraint that is proper to a devout and serious person and on an obscure question entertain no rash belief. Otherwise, if the truth later appear (quod postea veritas patefecerit), we are likely to despise it because of our attachment to our error, even though this explanation may not be in any way opposed to the sacred writings.22

“If the truth later appear . . .” Augustine shows himself keenly aware that knowledge progresses, so that prudence in interpreting difficult passages in Scripture is needful where the possibility of such advance in knowledge is real. Hence: The Principle of Prudence (PP): When trying to discern the meaning of a difficult Scriptural passage, one should keep in mind that different interpretations of the text may be possible, and that, in consequence one should not rush into premature commitment to one of these, especially since further progress in the search for truth may later undermine this interpretation.

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In his youth, Augustine had turned away from the Christian community in part because its adherents in North Africa appeared to his already highly educated taste naive and ill-informed about the high culture of the day. Now, once again a Christian, he is warning his fellow Christians against giving precisely this impression by proposing ill-founded interpretations of Scripture on issues in natural science where such interpretations could suffer easy refutation, thus bringing the Scriptures themselves into discredit:

Usually, even a non-Christian knows something about the earth, the heavens, and the other elements of this world, about the motion and orbit of the stars and even their sizes and relative positions, about the predictable eclipses of the sun and moon, the cycles of the years and the seasons, about the kinds of animals, shrubs, stones, and so forth, and this knowledge he holds to as being certain from reason and experience. Now it is a disgraceful and dangerous thing for an infidel to hear a Christian, presumably giving the meaning of Holy Scripture, talking nonsense on these topics, and we should take all means to prevent such an embarrassing situation, in which people show up vast ignorance in a Christian and laugh it to scorn. The shame is not so much that an ignorant individual is derided, but that people outside the household of the faith think our sacred writers held such opinions, and, to the great loss of those for whose salvation we toil, the writers of our Scripture are criticized and rejected as unlearned men. If they find a Christian mistaken in a field which they themselves know well and hear him maintaining foolish opinions about our book, how are they going to believe those books in matters concerning the resurrection of the dead, the hope of eternal life, and the kingdom of heaven, when they think their pages are full of falsehoods on facts which they themselves have learnt from experience and the light of reason?23

Augustine speaks here with passion. This was a matter on which he evidently felt very strongly He had encountered this sort of dogmatizing and had seen its consequences. When the Scriptures bear on issues where natural science (astronomy, the most developed natural science of his day, is his prime example) also claim competence, his urgent advice to Christian interpreters of Scripture is to go

23LMG, I, 19, 41. This eloquent passage has recently been cited to some effect by theological critics of “creation science,” an account of origins inspired by a literalist reading of Genesis, which sets aside much of modern evolutionary and geological science.

24O’Meara believes it likely that Augustine was acquainted with some of the manuals of astronomy of his day: “What is to be noted is the impression the exactitude of secular science made upon him: its certain findings had to he accepted” (O’Meara, “Augustine, literal and scientific,” 117).

very cautiously. At least, he says, be aware of the relevant knowledge of nature that is claimed to be “certain from reason and experience” (echoes here of PPD). And never lose sight of the harm that can be done to the Christian community by an imprudent handling of the sacred text.

The task of the exegete in Augustine’s day was far less constrained than it would later become. The predominance of the allegorical mode of interpretation in the Alexandrine school, as well as the latitude allowed to “literal” interpretation, meant that the widest variety of meanings could be, and were, attributed to even the most straightforward-seeming text. The De Genesi ad litteram, besides, dealt with one of the most interpretatively difficult parts of the Bible, the account of the Creation. It is, after all, the only segment of the Old Testament “histories” for which there were no human witnesses. It treats of the creative action of a Being whose agency lies far outside the range of human comprehension. Accommodating such a narrative to the limitations of human ways of knowing inevitably means that the narrative will lend itself to a multiplicity of interpretations and will test exegetical norms to the utmost. Can the principles that Augustine formulated in response to this challenge be transferred from the majestic context of the Creation to that of straightforward-seeming remarks about the motion of the sun and the immobility of the earth? Galileo certainly hoped so.

2. Galileo: The Letter to Castelli

My narrative is going to shift now, without apology, from the fifth to the seventeenth century, to 1613 A.D., to be precise. Copernicus’s great work, the De revolutionibus orbium coelestium, was already seventy years old. But it had only been in the few years previous to this that the new telescopic evidence of the satellites of Jupiter, the ever-changing sunspots, and the phases of Venus, had brought Copernican ideas of the earth’s motion and the sun’s rest to the broad public and had begun to give them a credibility among astronomers that they had heretofore lacked. Aristotelian philosophers were the most directly affected by the new discoveries: the evidence of Venus’ phases was sufficient of itself to show that the Aristotelian system of concentric spheres was untenable. But it was not long before theologians, themselves Aristotelian in sympathy, also sounded the alarm, summoning (as Galileo put it) the “terrible weapon” of Scripture in their cause.

It is important to be clear about what the casus belli really was, as far as the theologians were concerned. Was it the prospect of the ruin of Aristotelian cosmology that moved them, or was it the shift of the human abode from center to periphery? These are the motives that are usually alleged. And no doubt they did play a part in the violent opposition on the part of many theologians to the
Copernican proposal. But more fundamental in their eyes was the challenge the heliocentric system posed to the integrity of Scripture. A glance at the documentary evidence ought soon convince that Galileo’s theologian-critics were not simply using Scripture as a ploy, their real motive being a defense of an ancient human-centered cosmology. This was a time when wide-ranging disagreements regarding the interpretation of Scripture were raging between the Reformers and the theologians of the Counter-Reform. And here was an astronomer who contradicted some plain assertions in the Old Testament. Could this be borne? True, the theologians’ assurance was rooted not in Scripture alone, but in a physics that on the basis of sophisticated argument, had long ago set the earth firmly at the center of the universe. That physics had as yet no credible rival (Galileo’s *Dialogo* lay twenty years in the future). But what made it possible for the theologians to proceed against the Copernicans was not a philosophical argument but a theological warrant. At a time of crisis, the Scriptures were not to be tampered with.26

Galileo, at the center of the growing storm, realized very quickly that the theological threat to the Copernican ideas had to be countered if his own proposed development of these ideas was to prosper. By now he was convinced of the merits of the heliocentric system, and feared that the Church of which he was a loyal member risked making a terrible error unless someone could persuade its official representatives that the Copernican theses posed no challenge to Scripture after all. Never one to doubt his own powers of persuasion, even in an arena until that point entirely foreign to him, he turned his energies to the task.

His first try was in a letter to his former student, Benedetto Castelli, a Benedictine who had succeeded Galileo at the University of Pisa, and who had already encountered Scriptural objection to the Copernican proposal at a meal in the Medici palace, with the dowager Grand Duchess Christina of Lorraine not only present but actively engaged. The dispute clearly worried Galileo. The Medicis were his patrons; were they to be persuaded by the theological opposition to the Copernican theses, it could face him with a very difficult choice. And so in a short letter to Castelli he set out “to examine some general questions about the use of Holy Scripture in disputes involving physical conclusions.”27 His approach was a commonsense one. He quoted no theological authorities. His first point was that the Scriptures necessarily have to “accommodate the incapacity of ordinary people” (PA) and in so doing depart from the literal meaning of passages that would, for example, attribute hands and eyes to God. It follows, he says, that “in disputes about natural phenomena, (Scripture) should be reserved to the last place.” Though both Scripture and nature derive ultimately from God, Scripture is necessarily open to multiple interpretations, whereas “nature is inexorable and

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26 I have treated this issue in some detail in section 1 of “Galileo on science and Scripture.”
28 *Opere*, V:283; GA, 50
immutable” and is in no way bound to accommodate human understanding. Thus:

Whatever sensory experience places before our eyes or necessary demonstrations prove to us concerning natural effects should not be called into question on account of Scriptural passages whose words appear to have a different meaning, since not every statement of the Scripture is bound to obligations as severely as each effect of nature. This is PPD in a stronger form than Augustine has given it. It is obvious, he goes on, that two truths can never contradict one another (PNC) so:

The task of wise interpreters is to strive to find the true meanings of scriptural passages that would agree with those physical conclusions of which we are already certain and sure from clear sensory experience or from necessary demonstrations.

Even though Scripture is inspired, its interpreters are not. And so:

It would be prudent not to allow anyone to oblige scriptural passages to have to maintain the truth of any physical conclusions whose contrary could ever be proved to us by the senses and demonstrative and necessary reasons. Who wants to fix a limit for the human mind? Who wants to assert that everything which is knowable in the world is already known? Because of this, it would be most advisable not to add anything beyond necessity to the articles concerning salvation and the definition of the Faith.

Where Augustine, in counselling prudence, had laid most stress on the potential danger to the Church that incautious interpreters of Scripture can cause, Galileo emphasizes two other motives for his version of PP, both of them also mentioned by Augustine: the undoubted fallibility of scriptural interpreters, and the possibility that a claim to natural knowledge may prove true at a later time, even if at present it cannot be demonstrated. The combination of PPD and this version of PP would imply that where natural knowledge is concerned, interpreters of Scripture should always hold back, whether the claim to natural knowledge be demonstrated or not.

Galileo adds one further argument in support of this far-reaching conclusion:

The authority of Holy Writ has merely the aim of persuading men of those articles and propositions which are necessary for their salvation and surpass all human reason, and so could not become credible through some other science or other means except the mouth of the Holy Spirit itself.

This is the Principle of Limitation (PL) in the strongest possible form. The Scriptures are limited to doctrines that bear on human salvation; the sciences of nature lie outside their scope:

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I do not think it necessary to believe that the same God who has furnished us with senses, language, and intellect would want to bypass their use and give us by other means the information we can obtain with them. This applies especially to those sciences about which one can read only very small phrases and scattered conclusions in the Scripture, as is particularly the case for astronomy. . . .

Galileo is confident at this point that he has made his case. Where knowledge of nature is concerned, “the one who supports the true side will be able to provide a thousand experiments and a thousand necessary demonstrations for his side, whereas the other person can have nothing but sophisms, paralogisms, and fallacies.” Those who call on the Scriptures in this context are implicitly conceding that they are unable to make their case by appropriately physical arguments. He ends by assuring his friend, Castelli, that they have nothing to fear “as long as we are allowed to speak and to be heard by competent persons who are not excessively upset by their own emotions and interests.”

This is frank talk, not exactly likely to commend Galileo’s case to a reader of more conservative theological sympathies. Interestingly, when a hostile critic later forwarded a copy of the letter to the Holy Office in Rome, the assessor appointed to evaluate it found no fault with its overall argument, nor with the hermeneutic principles it advanced, nor even with its rather dismissive tone where theological criticism of the Copernican system was concerned, but only with a couple of phrases that had not (according to Galileo) been part of the original letter.

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32Opere, V:283–84; GA, 51.

33Opere, V:285; GA, 52. More than once in his writings, Galileo makes claims of this sort, as though controversy in natural science is a black and white affair, where only the “true side” has valid arguments in its support.

34Galileo ends the letter with an ingenious ad hominem argument, which has puzzled some of his commentators who have not realized that he is arguing ad hominem. He starts: let us concede to our opponents that the words of the disputed text in Joshua about the sun’s motion are to be taken literally. He then goes on to show that if one does this, the text can be shown to be incompatible with the Aristotelian world-system that these same opponents profess. To stop the apparent motion of the sun in the sky in the Aristotelian scheme, God would have had to stop, not the sun’s own proper motion, but the whole system of celestial spheres. So the Aristotelian cannot take the text literally. And then Galileo could not resist adding a further gloss which is a little too clever. His telescopic observations made it appear that the sun is rotating on its own axis. What if the sun’s rotation is causally responsible for the motion of the planets? In that case, stopping the sun would have the desired effect of stilling the sun in the terrestrial sky. So Galileo’s is the system that in that case could abide by the literal meaning. Of course, this is incompatible with what he had just argued about the irrelevance of Scripture to matters physical. But I suspect he intended this postscript as an extension of the ad hominem argument: If you insist on literal interpretation here, he is saying to the Aristotelians, it is I who will come out ahead. Moral: Better not insist!

35The usual explanation of this discrepancy is that whoever in Florence sent a copy of the letter to the Holy Office (the Dominican, Niccolò Lorini, seems the most likely candidate) had added a few phrases that would make the text more likely to be condemned. (Galileo hints at this, Opere, V:291–2; GA, 55). It has also been suggested that these phrases were really in the original letter but that Galileo prudently deleted them from the “official” copy of the letter that he later forwarded to Rome.
What will have struck the reader by now is the similarity between Galileo’s and Augustine’s responses to the conflict issue. At this point, Galileo is reacting more or less intuitively, formulating what appear to him to be commonsense principles of interpretation and in each case offering some supportive argument. He proposes versions of PA, PPD, PNC, PP, just as Augustine had done.

Where a difference between them appears is with regard to the weight to be given to Scripture in the event that the claim to natural knowledge is not demonstrated. Augustine seems to allow priority to Scripture in such a case (PPS), especially if the meaning of the Scripture passage is plain. And although he appears at one point to sanction a version of PL (“in the matter of the shape of the heaven, the sacred writers . . . did not wish to teach men such things as would be of no avail to their salvation”), he would surely not have given PL the scope that Galileo does; in his eyes, *Genesis* still can have something authoritative to say about the physical world.

There is no reason to think that Galileo was aware of Augustine’s commentary at the time he wrote to Castelli in December 1613. The strong resemblance between their views seems due, rather, to the fact that here were two highly intelligent men reacting to a very similar set of issues. And the difference between them might be traced to Augustine’s quite natural emphasis, as a theologian, on the revealed character of Scripture, and Galileo’s equally natural conviction regarding the sufficiency of the human powers of sense and reason is coming to know the order of nature.


In the months that followed, Galileo was reminded over and over of the gathering opposition in Rome to the Copernican claims. A letter from a friend, Piero Dini, in Rome let him know that the leading Roman theologian of the day, Cardinal Robert Bellarmine of the Society of Jesus, believed that the Copernican affair could immediately be settled by recalling that Copernicus himself made no claims regarding the real motions of earth and sun; mathematical astronomy in his eyes was no more than a practical device useful for prediction, calendar making, and the like. Galileo strenuously disagreed with this claim, pointing out to Dini that it misrepresented Copernicus (assuming too readily that the Forward appended to the *De Revolutionibus* had, indeed, been Copernicus’ own work) and that it also misrepresented the full scope of Copernican astronomy which set out to declare the “true structure” of the world.³⁶

One theologian had, however, already declared himself on the heliocentric side of the debate. Paolo Antonio Foscarini, a prominent Carmelite, had just dis-

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tributed a treatise accommodating the Scriptures to the Copernican world-system, which he regarded as “clearly probable.” The hermeneutic principles on which he relied resembled Galileo’s in some regards (PA and PL). But he went further than Galileo had done by claiming (somewhat inconsistently with PL) that the Scriptures supported the Copernican system better than they did the geocentric one. Bellarmine’s response to Foscarini is one of the key documents in the entire Galileo affair. We shall see more of it later. Galileo received a copy of Bellarmine’s letter, and he made some notes toward a possible response. But he was engaged in a more ambitious pursuit, one that during those first months of 1615 must have occupied most of his time, burdened as he also was by severe illness.

He had by now realized that he had to make his case not just by citing commonsense hermeneutic principles, as he had done in his Letter to Castelli, but by validating these principles by an appeal to tradition, the dominant motif of the Counter-Reform initiated by the Council of Trent. No theologian himself, he knew that he needed help. So he sought advice from Castelli and probably from others of his theologian friends. Castelli wrote from Rome in January 1615 to say that a Barnabite priest of his acquaintance had promised to send citations from Augustine and other Fathers of the Church in support of Galileo’s interpretation of the passage in Joshua referring to the sun’s motion.

It is possible that Galileo may have read the first two books of Augustine’s De Genesi ad litteram on the advice of his friends. The work was known among the exegetes of the time for its manner of dealing with apparent conflicts between Scripture and the claims of sense or reason. Or he may simply have been given a copy of the relevant passages. At any rate, he decided to make Augustine the foundation of his hermeneutical treatise, a safe choice, it must have seemed. He also drew on another obvious source: the most authoritative commentary on Genesis of his own day, that by Benito Pereira, S.J. Once again, he may not have consulted the work directly; he may only have received a copy of an opening page where Pereira lays out four “rules” that should guide interpretation in cases of dispute about the literal sense of Scripture. Galileo quotes the fourth rule, which

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37 Dini to Galileo, 7 March 1615 in Opere, XII:151–2, GA, 58; Galileo to Dini, 23 March, 1615 in Opere, V:299–300; GA, 60.
39 These notes make up Appendix IX in Blackwell, Galileo, Bellarmine, and the Bible.
40 I incline to the latter alternative. He omits reference, as we have seen, to a key passage in the De Genesi where Augustine calls on the Principle of Accommodation to explain the passage, “star differs from star in glory:: they appear thus to people on earth, though in reality they could be equally bright.” This would so directly support the application of PA to the Copernican case (the sun appears to people on earth to be in motion) that it seems unlikely that Galileo would have missed it if he had himself been combing the De Genesis for support.
41 Benito Pereira (Benedictus Pererius), Commentariorum et disputacionum in Genesisi tomi quatuor (Rome: Ferrari, 1591–5).
42 For a translation of Foscarini’s Responsio, see Blackwell, Galileo, Bellarmine, and the Bible, Appendix VII.
43 It was first published in 1636 by Elzevir in Strasbourg, with a Latin translation.
advise that Scripture ought never be interpreted in such a way as to contradict “manifest evidence and the arguments of philosophy or other disciplines” (PPD). And from the same page, he quotes a passage from Augustine’s De Genesi in Pereira’s paraphrase version. Galileo may have learnt of the Pereira text from a response that Foscarini wrote in answer to theological criticisms of his defense of Copernicus. Foscarini quotes the same Pereira version of Augustine that Galileo cites though in a slightly abbreviated form. Galileo also draws on two quotations from St. Jerome that he could have picked up from Foscarini.

The Letter to the Grand Duchess Christina was finished around June 1615. It was formally addressed to the Dowager Grand Duchess, Christina of Lorraine, the mother of Galileo’s patron, Cosimo II de Medici. There were no learned journals in those days; a favored way of gaining publicity for something shorter than a book-length manuscript was to address it to a notable personage and then distribute copies as widely as practicable. An additional advantage of this approach was that it avoided the need to go through the formal censorship procedure. It is not clear how widely the Letter was, in fact, circulated, and even whether it had reached Rome prior to the crucial deliberations of February 1616. There is no mention of it, or of the arguments it presents, in the Roman documents of that period.

The hermeneutic principles that Galileo had earlier sketched in the Letter to Castelli appear again here, but now fortified by numerous passages from Augustine (fourteen in all from the De Genesi ad litteram) and a handful of references to other theological authorities (Tertullian, St. Jerome, Dionysius, Peter Lombard, Thomas Aquinas, Cajetan; among theologians closer to his own time, Paul of Burgos, Diego de Zuniga, Alfonso Tostado, Benito Pereira). It was an impressive show, intended to convince the reader that he had a solid basis for his hermeneutics in the theological tradition. There is no comparable work from that time on the other side of the Copernican issue, so far as I can tell.

Galileo shares with Augustine the presumption that genuine conflict between the two sources of truth is impossible (PNC). He lays particular stress on, and gives a persuasive justification for, the Principle of Accommodation (PA). He counsels prudence (PP) on interpreters of Scripture, making explicit what had only been a suggestion in Augustine: abstain from judgment regarding “physical conclusions whose contrary could ever be proved to us by the senses and demonstrative and necessary reasons.” And he formulates a much more explicit, and more far-reaching principle of Limitation (PL) than Augustine’s, crystallizing it in an aphorism credited by him to Cardinal Baronio: “The intention of the Holy Spirit is to teach us how to go to heaven, and not how the heavens go.”

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who has given us senses, language, and intellect would surely not want to bypass these by revealing to us what we could have discovered on our own. Besides, astronomical matters are mentioned hardly at all in Scripture and only in passing. Had God wished to reveal truths about the natural world in Scripture, surely it would have been done in a more systematic and definitive way. Such truths are of no relevance to the known purpose of Scripture.

The combined implication of these three principles for the Copernican issue is clear. Scripture is simply irrelevant to deciding such matters as the motion of sun or earth (PL). Furthermore, even if PL were left aside, the writers of Scripture are clearly accommodating themselves to our normal modes of speech, to what appears to us, when they speak of the sun as in motion or the earth as fixed (PA). Finally, even if both PL and PA were to be set aside, ordinary prudence would counsel that on an issue where in the future a contrary demonstration could well be found, no dogmatic position should be taken now that at a later time could serve to discredit the Scriptures generally (PP). To the extent that the interpreting of Scripture were governed by this set of principles, no real conflict could arise regarding the Copernican theses since the Scripture has no bearing on them.

There are, however, two other principles to be taken into account. And their combined implication is of a very different sort. The theme to which Galileo returns again and again in the Letter is “the importance of necessary demonstrations in conclusions about natural phenomena.” It is the demonstrated character of natural knowledge that gives it weight, he says, in matters bearing on Scriptural exegesis (PPD). His Aristotelian background shows itself very clearly at this point. Any claim which falls short of demonstration does not qualify as knowledge, strictly speaking. He appears to be using the term ‘necessary demonstration’ in a relatively broad sense to mean any process of reasoning about the physical world that leads to certitude: “The true meaning of the sacred texts . . .

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44GA, 96.
45GA, 96
46His exposure to the Aristotelian notion of demonstration during his early years as a teacher of natural philosophy has been documented by William Wallace in a series of writings. See, for example, his Galileo’s Logic of Discovery and Proof (Dordrecht: Kluwer, 1992).
47GA, 96.
48GA, 94.
49Annibale Fantoli finds it hard to believe that Galileo would endorse PPS so explicitly, since it is so clearly at odds with the “principle of the autonomy of scientific research” which he sees as the fundamental thesis of the Letter.
50GA, 102.
will undoubtedly agree with those physical conclusions of which we are already
certain and sure through clear observation and necessary demonstration.”^v

The implication here is that the claim to natural knowledge has to be beyond
doubt in order to carry weight in the exegesis of Scripture. And this implication is
reinforced by a couple of passages that suggest that in the absence of demonstra-
tion, the literal sense of the Scripture passage should be given priority (PPS):

In regard to those propositions which are not articles of faith, the author-
ity of the same Holy Writ should have priority over the authority of any
human writings containing pure narration or even probable reasons but
no demonstrative proofs (scritte non con metodo dimostrativo). This
principle should be considered appropriate and necessary inasmuch as
divine wisdom surpasses all human judgment and speculation.48

This seems pretty definite; it echoes Augustine, but is even more explicit about
the weak status of assertions lacking demonstration.49 And the same point seems
to be conveyed by a passage already noted in Augustine which Galileo quotes in
the paraphrase version found in Pereira’s commentary on Genesis:

In the learned books of worldly authors are contained some propositions
about nature that are truly demonstrated and others that are simply
taught. In regard to the former, the task of wise theologians is to show
that they are not contrary to Holy Scripture; as for the latter, which are
taught but not demonstrated with necessity, if they contain anything con-
trary to Holy Writ, they must be considered indubitably false and must
be demonstrated such by every possible means.50

The contrast here is between two classes of propositions, those that are “truly
demonstrated” and those that are “taught but not demonstrated with necessity.” To
take the latter to be “indubitably false” in case of apparent conflict with Scripture
would award priority to the literal reading of Scripture in so strong a form that it is
hard to see how Galileo could miss the conflict between this and the triad
PL/PA/PP he had urged so strongly.51 Perhaps one could read Augustine, as earli-
er suggested, and then Galileo as well, as restricting this uncompromising charac-
terization, “indubitably false,” to assertions that are clearly contrary to the
Catholic faith. But this would leave undecided the status of assertions that lack
demonstration though they enjoy a substantial measure of likelihood on the basis
of the evidence of the senses or the reason, while at the same time conflicting with
the literal interpretation of Scripture, though not with any known truth of the
Catholic faith. And this, of course, as we know, was to prove the decisive category
in Galileo’s struggle with his Roman critics.

Summing up regarding this second set of principles, PPD and PPD, there can
be no doubt that Galileo strongly urges the first of these and gives at least the impression of favoring the second. The combined implication then would be that where there is an apparent conflict between the immediate meaning of a Scripture passage and an assertion based on the human powers of sense and reason, the latter must be held to the standard of demonstration if it is to carry weight. Where PL would lay down that the Scriptures are simply not relevant to matters of natural knowledge, and PA would reinforce this by maintaining that the language of Scripture is accommodated to the capacities of its prospective audience and hence to the appearances only of natural phenomena, PPD/PPS would still imply the relevance of the literal meaning of Scripture to assertions about the physical world where no contrary assertion from the side of the senses or reason has been shown beyond doubt to be the case.

4. Reflections

The implications of this disagreement of principle for the Copernican debate hardly needs stressing. If one were to be guided by PL/PA, the passages in the Old Testament where the sun’s motion or the earth’s immobility are mentioned would not be granted any particular authority regarding the realities of the actual dynamic relationship of sun and earth. To make his point, Galileo would not, then, be called on to demonstrate the Copernican case; the only arguments of relevance to this case would come from “the senses and reason,” whatever the merits of those arguments would happen to be. If one relied, instead, on PP alone, the Scriptures might still be supposed to carry weight in matters cosmological, but in the absence of demonstration on the side of human ways of knowing one would still abstain from any definitive judgment in favor of the literal interpretation of the Scriptural text.

On the other hand, if PPD/PPS were to be the guiding norms, the implica-

51Because of this, a number of commentators have endeavored to find other ways of reading the second part of this passage than the literal one. See, for example, Maurice Finocchiaro, “The methodological background to Galileo’s trial,” in Reinterpreting Galileo, ed. William Wallace (Washington: Catholic University of America Press, 1986), 266; and Fantoli, For Copernicanism, p. 198.

52Most would say that, in an appropriate sense of ‘prove,’ Newton proved the earth’s motion around the sun. Others would delay that certification until the Foucault pendulum brought confirmation. In his report to the Pope on the termination of the Galileo Commission in 1992, Cardinal Paul Poupard noted that it was only when “optical proof” of the earth’s motion became available (through the observation of parallax in the position of the fixed stars as the earth traversed its yearly orbit) that Pope Benedict XIV had the Holy Office finally grant an Imprimatur to Galileo’s works in 1741 (“Galileo: Report on Papal Commission Findings,” Origins, 22, November 12, 1992, 374–5). Until then, apparently, the PPD/PPS mandate was in force, requiring what the cardinal calls an “irrefutable” proof of the earth’s motion before the literal interpretation of the relevant Scripture passages could be set aside. It is not clear from the cardinal’s report when that mandate was relaxed, or indeed whether it still has been.

53GA, 88.
tions for the Copernican debate would be quite different. One would have to produce a “demonstration” of the Copernican theses before the literal reading of the Old Testament passages would yield ground. This, of course, Galileo could not do, and it is a matter of some debate as to when a demonstration was, in fact, achieved, if indeed (some would say) it ever has been.  

There is obviously a puzzle here. Why did Galileo choose to make his case in the way he did in the Letter to the Grand Duchess? He could hardly have failed to notice the tensions within the hermeneutical principles he is laying out. Should he not have seen that he would be held to very different standards of proof regarding the Copernican issue, depending on which of his principles were to be relied on? Several different considerations may have influenced his judgment.

He appears to have been fairly confident at this point that he had, or was on the point of having, an acceptable proof of the Copernican theses. Indeed, the Letter opens with the unqualified claim: “I hold that the sun is located at the center of the revolutions of the heavenly orbs and does not change place, and that the earth rotates on itself and rotates around it.” If he thought that he could, indeed, demonstrate the earth’s motion, for example by the argument from the tides that he had been working on for some time, this could have emboldened him to accept the heavier demands of PPD/PPS which he knew would, in any event, be more acceptable to his Roman critics.

A second factor undoubtedly was the set of assumptions regarding the nature of knowledge to which, as we have seen, Galileo had been introduced during his first days as a teacher of natural philosophy at the University of Pisa. When he wrote about knowledge of the physical world, the phrase ‘necessary demonstration’ that is dotted throughout the Letter, came naturally to him from the grounding in Aristotle’s Posterior Analytics he had had years before. There was no half-way house in his philosophy of science between knowledge in the more or less strict sense and opinion. There is ample evidence in his writing that he had not developed any clear idea of degrees of likelihood. Though he admits hypothesis in his cosmological writings about comets, sunspots, lunar mountains, and the like, and warrants his claims there by the consequences drawn from them, he had, unlike his contemporary, Johannes Kepler, no apparent appreciation for the nuances of hypothetical reasoning. In particular, there seems to be no acceptable place in his thinking for a well-supported theory that, nevertheless, falls short of actual proof.

Finally, there is the influence of Augustine. In the Letter to Castelli, prior to his contact with Augustine’s hermeneutics, there is no trace of PPS, of the view that in the absence of demonstration, the immediate meaning of Scripture should

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still be accepted as authoritative. The priority he at least sometimes appears to allow to Scripture in the *Letter to the Grand Duchess* clearly derives from Augustine. And the tension already present in the *De Genesi* between PL/PA and PPD/PPS is carried over into Galileo's *Letter*. Galileo did not originate this tension; it was already there within the hermeneutic tradition deriving from Augustine. It prompts in us an immediate question: Where there is an apparent conflict between Scripture and the ordinary sources of human knowledge regarding some feature of the physical world, ought one lay demands of proof on the latter side or not? Must one wait for a Newton or a Foucault before seeking an alternative reading of the disputed Scriptural passage? Is an earlier challenge to a literal interpretation of Scripture impermissible? There are grounds in Augustine, and even more clearly in Galileo, for both positive and negative responses to these questions. In Augustine's own day and even during the long interval between that and Galileo's, this ambivalence had not led to confrontation. But with the decline of the Aristotelian cosmology that had fitted so well with the simple geocentric world-picture informing the Hebrew Scriptures, it was all too likely that the fault-line in the Augustinian hermeneutics would show itself.

The *Letter to the Grand Duchess* had, as far as we can tell, little if any impact on the fateful deliberations that led in 1616 to the banning in Rome of Copernicus's *De Revolutionibus* on the grounds that it contained claims regarding the motion of the earth and immobility of the sun that were “contrary to Scripture.” So what relevance has our analysis of the hermeneutic principles of the *Letter* to the complex of events collectively known today as the “Galileo affair”? The answer would have to be, at best, a tentative one.

The consultors of the Holy Office evaluated the Copernican thesis in February 1616 and found the thesis maintaining the immobility of the sun at the center of the planetary system to be:

> foolish and absurd in philosophy [i.e. in natural science] and formally heretical since it explicitly contradicts in many places the sense of Holy Scripture according to the literal meaning of the words and according to the common interpretation and understanding of the Holy Fathers and the doctors of theology.\(^5\)

Since the immobility of the earth was less clearly asserted in Scripture, the judgment on it was slightly less severe: the same judgment from the “philosophic” standpoint and in theology “at least erroneous in faith.”

We have no record of the few days of deliberation that the consultors gave to the matter, nor to the subsequent discussion within the Cardinals of the Holy Office that led to the placing of the *De Revolutionibus* on the Index of Prohibited


\(^5\)GA, 146.

\(^6\)GA, 108.

\(^7\)GA, 67.
Books on March 5. But it seems safe to say that the Augustinian/Galilean principles PL/PA/PP were ignored, and PPD/PPS were strictly followed. And a new principle that Augustine had not envisioned in the De Genesi was also adduced: the common consent of the Fathers and theologians of the Church.

This last reflects the influence of the Council of Trent (1545–63). Bellarmine’s letter to Foscarini had alerted Galileo that this argument would be used against the Copernican doctrine. Galileo directly challenged the application of this principle to the Copernican case: “I should think that at most this ought to apply only to those conclusions which the Fathers discussed and inspected with great diligence and debated on both sides of the issue and for which they then all agreed to reject one side and hold the other.”

The sun’s motion had never been an issue for the Fathers; their taking it for granted simply reflected the common belief of the day and not a considered judgment on their part.

This appeal to the authority of the Fathers may strike the reader as somewhat ironic given the way in which Augustine’s prudential advice (PP) and his emphasis on accommodation (PA) were ignored, if indeed the De Genesi was ever taken into account at all. It should have been, since it was a standard source, as the advice Galileo received from his theologian friends shows. But, of course, as we have seen, its advice was a divided one. The Cardinals of the Holy Office could always claim to be following PPD/PPS. And one of those Cardinals, at least, was quite certain not only that no demonstration of the Copernican theses had been given (“false in philosophy”), but also that none could, in principle, be given and hence that the literal interpretation of Scripture was the only one permitted.

In his response to Foscarini, Bellarmine made it abundantly clear that in his view the mathematics of astronomers like Copernicus can at best only save the appearances; it can never attest to the reality of one motion over another. This was, of course, the traditional view of the limitations of mathematical (as against “physical” or causal) reasoning in astronomy. Besides, the direct testimony of experience attests to the fact that “the earth stands still and that the eye is not in error when it judges that the sun moves.” This is not merely appearance, as are the data of the astronomer. It is something of which one could be certain, Bellarmine affirms.

But there was one further consideration that may have weighed even more heavily in convincing him that a demonstration of the earth’s motion could never, in fact, be given. From the outset of his academic career at the University of Louvain, he had been strongly literalist in his approach to Scripture, more literalist than most of his fellow-Jesuits. In his lectures on astronomy, for example, he departed radically from the cosmology of Aristotle, rejecting the system of con-
centric spheres and advocating a cosmology closer to the commonsense Hebraic world-view of the Old Testament. Perhaps it was his later debates with Reformation theologians that led him in his response to Foscarini to advocate an even more literalist reading of the historical texts of Scripture than the Council of Trent had envisaged: "It would be as heretical to say that Abraham did not have two children . . . as to say that Christ was not born of a virgin." Given this devotion to the literal word of Scripture, it is hardly surprising, then, that he should take the same uncompromising line with regard to passages like the one in Joshua where the motion of the sun is said to be miraculously stilled in response to Joshua's prayer. His conclusion is that to take the Copernican astronomy to signify the motion of earth instead of sun would "harm the Holy Faith by rendering Holy Scripture false."

What are we to make then of the apparent openness of mind, much lauded by some commentators on the Galileo affair, where Bellarmine remarks that if a demonstration of the earth's motion could be shown him, "one would have to proceed with great care in explaining the Scriptures"? In the context of the remainder of the letter to Foscarini, it seems reasonably clear that this is no more than a polite counter-factual. Not for one moment did Bellarmine believe that this could ever happen. This is why, though a prudent man, he did not think it needful to be concerned about the possibly adverse consequences for the Church of an unequivocally negative decision in regard to the Copernican system. He can hardly have been unaware of Augustine's prudential advice in the De Genesi, given his thorough knowledge of the principal texts of the Fathers of the Church. But his assurance, on many grounds, of the falsity of the Copernican astronomy if interpreted literally, was such that the wisdom of invoking a prudential principle (PP) in this case evidently did not occur to him.

But why would he not have taken PA more seriously? After all, theologians as diverse as Thomas Aquinas and John Calvin had been prepared to allow a principle of this sort, and references to the motion of the sun and the immobility of the earth would seem obvious candidates for accommodation (recall Augustine on the differences in apparent brightness of the stars). Bellarmine addresses this objection directly:

Suppose you say that Solomon speaks in accordance with appearances; since it seems to us that the sun moves (while the earth in fact moves), just as to someone who moves away from the seashore on a ship, it looks like the shore is moving. His response is peculiarly unsatisfying: The passenger knows that it is really the ship that is moving so that he corrects his first impressions. Whereas in the case of

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59GA, 68.
60GA, 68. Emphasis mine.
the earth, there is no need to correct, “since he clearly experiences that the earth stands still, and that the eye is not in error when it judges that the sun moves.” The appeal to experience clearly begs the question here: the same appeal can be made in the case of the ship’s passenger. The correction to the testimony of direct experience in this latter case is made on the grounds of other knowledge; the Copernican may well ask why the same sort of appeal cannot be made in the case of the sun’s apparent motion. Bellarmine is, therefore, guided exclusively by PPD and PPS: the absolute need for demonstration on the Copernican side and the priority of the literal meaning of Scripture in case of any doubt. The remaining Augustinian-Galilean principles fail to modulate his negative judgment on the Copernican theses: PP and PA need not be considered since the theses can never be demonstrated and the literal sense of the Scripture passages is clear. His literalist approach to Scripture would render suspect the sort of limitation signaled by PL. To Bellarmine, the case was open and shut, just as open and shut as it appeared to Galileo on the other side.

They were both relying on principles that found a precedent in Augustine’s *De Genesi*. But the fateful tension between PPD/PPS and PL/PA/PP meant that the two men could arrive at entirely opposite assessments. And each of the two, in addition, quite miscalculated the strength of the Copernican argument, Galileo supposing it to be at or near the level of demonstration, and Bellarmine discounting it entirely on the grounds that we “clearly experience” that the earth is not moving.

The decision in March 1616 by the Holy Office to outlaw the Copernican theses was the decisive moment in the Galileo affair. The later condemnation of Galileo’s *Dialogue on Two Chief World Systems* in 1633 and the demand that he abjure the Copernican theses came, despite the complexity of the issues surrounding the famous trial, almost by way of postscript. We know nothing of the discussions that went on in 1616 among the consultors to the Holy Office who recommended that the Copernican theses be declared “formally heretical,” or the debates a few days later among the cardinal members of the Holy Office itself who softened the wording of the condemnation to “contrary to Scripture.” But we can be sure that Bellarmine would have played a leading role in guiding the deliberations. It was he, after all, who was entrusted by the Pope with the task of conveying the unwelcome news to Galileo that he should abandon the “Copernican opinions” on pain of imprisonment if he should not acquiesce.

But the responsibility for this fateful decision cannot be laid on Bellarmine alone. The views he expressed in the letter to Foscarini would very likely have been endorsed by a great majority of the Roman theologians of the day. True, his
Biblicist cosmology would have been challenged by his Thomist colleagues. And his devotion to the literal word of Scripture might not have been fully shared by all. But there would have been no disagreement about the requirement of demonstration on the Copernican side. And in those stressful times, as the Reformers and the Counter-Reformers battled one another over the interpretation of key passages of Scripture, anyone who challenged the conventional reading of a Scripture text was bound to incur suspicion, especially if that someone were to be a "mathematician," not a theologian. Hardly surprising, then, that the Augustinian principles should tilt one way for those who were entrusted with guarding theological orthodoxy in Rome, and another quite different way for an adventurous spirit in Florence who was exploring new and unfamiliar ways of knowing that would not easily lend themselves to the ancient demand of demonstration.