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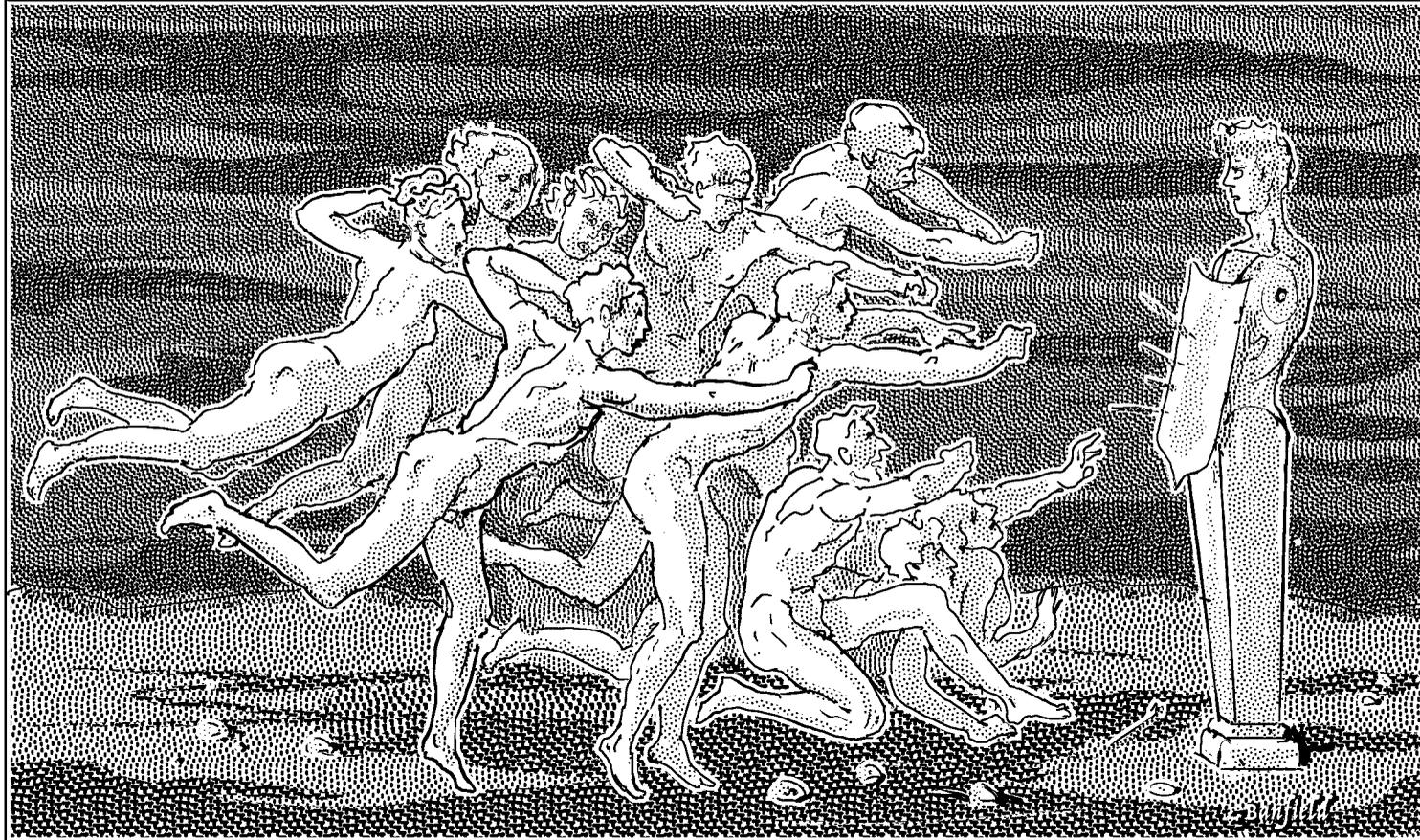
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CHRISTIAN SCIENCE?

Aristotle's Revenge: The Metaphysical Foundations of Physical and Biological Science, by Edward Feser.
Editiones Scholasticae, 515 pages, \$29.90



"Archers Shooting at a Herm," after the original drawing by Michelangelo, c. 1530

THE WORD "REVENGE" COMES FROM the old French *revenge*, which in turn comes from the Latin *revindicare*, meaning to assert or demonstrate (*dicare*) power or supremacy (*vis*) in return (*re-*) for some perceived injustice. In both origin and present usage, then, "revenge" is a political word. Edward Feser's *Aristotle's Revenge: The Metaphysical Foundations of Physical and Biological Science* is a dense work of scholarship about physical and biological science. But it is also, albeit inadvertently, a political book.

Feser is not by any stretch the first for whom politics and science have proven interrelated. In his *Discourses on Livy*, Niccolò Machiavelli drew a connection between physical and social science when he lamented that readers of history seemed uninterested in applying lessons from the past to the problems of the present day. Such readers, Machiavelli wrote, behave "as though heaven, the sun, the elements, and men had changed the order of their motions and power, and were different

from what they were in ancient times." Machiavelli sought to reclaim for the politics of his time an ancient way of thinking in which there were no wholly impermissible political actions any more than there were impossible observable phenomena in physical science.

FOUR AND A HALF CENTURIES LATER, Leo Strauss also wished to reclaim for his own time an ancient political rationalism. Strauss wrote in *Natural Right and History* (1953) of the tensions among revelation, natural right, and modern science:

Looking around us, we see two hostile camps, heavily fortified and strictly guarded. One is occupied by the liberals of various description, the other by the Catholic and non-Catholic disciples of Thomas Aquinas. But...[t]hey all are modern men. We all are in the grip of the same difficulty. Natural right in its classic form is connected with a teleo-

logical view of the universe.... The teleological view of the universe, of which the teleological view of man forms a part, would seem to have been destroyed by modern natural science.

Strauss intimated that the problem of natural right could not be resolved without adequate reconciliation between two seemingly incompatible cosmological visions: that of modern science and that of classical antiquity, particularly Aristotle's. Man could not have objective ends or purposes, knowable by human inquiry, in a universe purely mechanical and arbitrary in origin.

Although Strauss's teaching appears differently (often radically so) to different students, a rudimentary assessment of Strauss's work may categorize his "reconciliation" between these two visions as Platonic. Averting direct confrontation with the cosmological perspective of modern science, Strauss, like Plato, did not himself assert a definitive cos-

mology. Rather, Strauss's work may be seen as a dialectical inquiry only. He questioned the opinions—exoteric and, especially, esoteric—of antiquity's great philosophers to find what permanent political wisdom, if any, might be revealed. Strauss's *agora* is the library of great books, his interlocutors the most sophisticated thinkers on political philosophy of the ancient and modern world. On the point of cosmology and metaphysics, however, one can fairly say that Strauss claimed to know only that he knew nothing.

A Straussian reading of Aristotle thus emphasizes the divide between practical and theoretical wisdom described in Book VI of the *Nicomachean Ethics*. This divide makes possible the evaluation of Aristotle's political teaching, without a definitive view of Aristotle's physics or metaphysics. Noetic heterogeneity—the accessibility of different phenomena to different capacities of reason—suggests the possibility of an adequate understanding of politics, or social science, coexisting with an uncertain or indefinite understanding of physical and metaphysical science. In this sense Strauss sought to restore, not classical rationalism *tout court*, but only classical *political* rationalism. To paraphrase Martin Heidegger, Strauss sanctioned the continued neglect of the study of Being.

A RENOWNED CONTEMPORARY WRITER on philosophy and Christianity, Feser is no Straussian—I believe he will freely admit this. But Feser, in my view, is not a consistent Aristotelian, either—and this I believe he will vigorously contest.

I suspect that Feser will take umbrage at my assertion that he is not a consistent Aristotelian because he will maintain that Aristotle's thought is enlarged by its integration with Christianity. Where Aquinas and the later schoolmen apprehend Aristotle differently from the way the ancient Lyceum did, I presume Feser will say the differences are not fundamental, but mostly represent clarifications and corrections of Aristotle's errors, omissions, and ambiguities. The essential core of Aristotelian doctrine is unchanged, Feser will say, by the advances of Thomas Aquinas and the scholastics.

This explains several features of *Aristotle's Revenge*. For one, Feser tends to use the terms "Aristotelian," "Aristotelian tradition," and "Aristotelian-Thomistic" somewhat interchangeably, suggesting that any differences among them are minimal. His impressive bibliography—a resource in itself for the curious—includes only one book of Aristotle, the R.P. Hardie and R.K. Gaye translation of *Physics*. Yet it

includes five books of Aquinas, including the massive *Summa Theologica* and *Summa Contra Gentiles*. It is not merely the bibliographic paucity of Aristotle compared to Aquinas; it is the scope of the cited works. The two *Summae* set out a comprehensive account of the whole of creation and being. Aristotle's *Physics* is only a part of Aristotle's larger thought.

IN CITING *PHYSICS* ALONE OF ARISTOTLE'S work, Feser has chosen the text of Aristotle that has suffered the greatest derogation by modern critics of classical thought. Aristotle's physics contains a number of conclusions about physics that have been widely mocked. Bodies fall to the earth through the air because of gravity, not because they have a "natural place" towards which they are impelled to return. The material universe is made up of many, many more than four elemental kinds of particle. The fact that Aristotle, using the rudimentary instruments of his age, could not experience these things has so affected thought about him that even devotees of his teaching have dismissed his physics. Indeed, one of the foremost interpreters of Aristotle of the last century wrote:

One can hardly imagine an enterprising astronomer investing serious effort on Aristotle's treatise *On the Heavens*, when he knew that a glance through the telescope would disprove the major conclusions of that work.

and

It would, of course, be absurd for someone to study those parts of Aristotle's physical theories that have been disproven by the empirical data of modern physical science because he was dissatisfied by the empirical data of modern physical science.

Harry V. Jaffa wrote these words in *Thomism and Aristotelianism* (1952) with the rehabilitative intention of distancing Aristotle the political scientist from Aristotle the physical scientist. Feser too renounces certain of Aristotle's conclusions in physical science, such as the doctrine of natural place, with a similar intention. So as not to destroy Aristotle the "philosopher of nature," Feser distances himself from Aristotle the physicist.

It is, however, not necessary to treat Aristotle the physicist so roughly. Carlo Rovelli, in an ingenious essay from 2013 entitled "Aristotle's Physics: A Physicist's Look," makes the astounding case that "Aristotelian physics is a correct and non-intuitive approximation of

Newtonian physics in the suitable domain (motion in fluids), in the same technical sense in which Newton's theory is an approximation of Einstein's theory." Given that Aristotle's observations were limited to solid objects moving through air or liquids exhibiting the effects of drag, lift, and buoyancy, Rovelli shows that many of Aristotle's conclusions were provisionally correct. To do this, Rovelli reduces Aristotle's account of motion to mathematical expressions, illustrating the proximity of Aristotle's physics to Isaac Newton's. Indulge, for a moment, an argument from authority: Rovelli is no hobbyist in the field of science. He is a senior statesman of theoretical physics and a savant of loop quantum gravity theory, which aims to harmonize Albert Einstein's equations of special and general relativity with quantum physics.

IN ATTEMPTING TO RECONCILE ARISTOTLE and Newton, Rovelli explicitly rejects as a "*vulgata*" the American philosopher Thomas Kuhn's thesis of scientific structural revolution. Kuhn argued that major intellectual developments—such as the Copernican change from geocentric to heliocentric astronomy—fundamentally overturn rather than amend the ground rules of scientific thought. By calling this view a *vulgata*, I understand Rovelli to mean that it has become a widely (and unthinkingly) accepted doctrine which is nevertheless at odds with experience. "Science," Rovelli writes, "generates discontinuities and constantly critically re-evaluates received ideas, but it builds on past knowledge and its cumulative aspects by very far outnumber its discontinuities." Aristotle, Newton, and Einstein can each be correct in a certain way. This idea of continuity and cumulative science is similar to a concept in Book IV of Aristotle's *Metaphysics*:

[W]e should not say that two and three alike are both even, nor that both he who regards four to be five and he who regards one thousand to be five are alike mistaken. And if they are not alike mistaken, it is clear that the first man is less mistaken and so thinks more truly.

Aristotle deploys this argument in rebuttal of ancient doctrines that denied the possibility of a thing being made objectively definite by thinking.

Aristotle's account of truth allowed, against these doctrines, for each of two or more accounts of experience to be partly true and for one to be nearer to the truth. The truth about a thing may be understood adequately without being understood exactly.



Einstein popularized his new and truer physics in 1916 with *Relativity: The Special and the General Theory*. This highly readable book questioned whether space has a real existence, or whether all space consists simply of relationships between different material bodies. This is a very important question for Aristotle. In *Metaphysics*, especially Books III and VII, the concept of location requires space to have a real existence or substance: there must be an actual thing called “space,” consisting of points within an absolute frame of reference. Aristotle is explicit that if space has no real existence or substance, then no thing has being. The issue is also important for Aquinas and for Feser. Feser devotes considerable ink to discussing and criticizing “relationalist” interpretations of space.

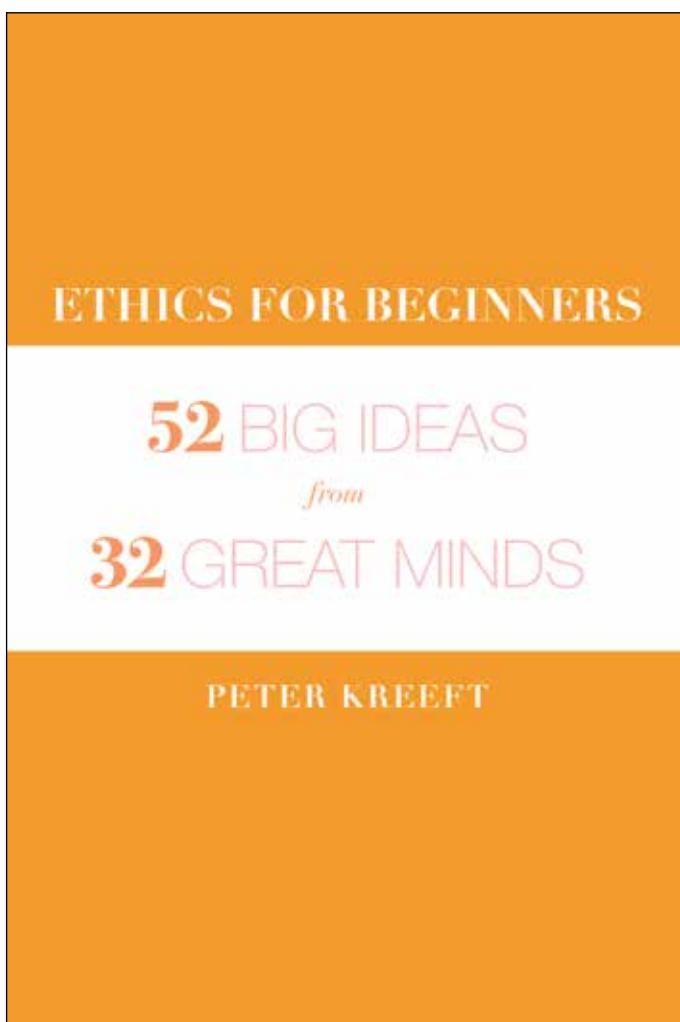
IN *ARISTOTLE’S REVENGE*, HOWEVER, FESER does not discuss an important development pertaining to this problem. In 1952, less than three years before his death, Einstein changed his mind about space. To the 15th edition of *Relativity* Einstein added an *Appendix V*. There he conceded, in the course of an examination of pre-scientific experience as it relates to time and space, that the field-equations of relativity are consistent with the notion of space having a real existence.

Appendix V subsequently became the ground of loop quantum gravity, which maintains that space has a real existence. In fact, it is “quantal”: the theory posits that there is a smallest quantity of space, from which there is no linear decrease to zero. Space in loop quantum gravity can overlap, like loops of chainmail, with each loop overlaying another to a greater or lesser degree. One implication of the theory is that there exists a limit to the expansion, compression, and distortion of space. A second implication is that singularities—the compression of space and matter to a single point having a spatial value of zero—do not occur in the way the generally accepted model of a black hole would predict. A third implication, which follows from the first and second, is that the cosmos may be undergoing a cyclical motion, so that it will eventually reverse its current expansion and return to its pre-big-bang state of compression in what is termed the “big crunch.” This would be followed by another expansion (a “big bounce”), followed by another big crunch, and so on for eternity. Such a series of circular motions might remind one of the recursive, circular motion that Aristotle identifies in *Metaphysics* as the prime motion.

Here is where all this butts up against *Aristotle’s Revenge*: the scholastic view of prime motion is different from Aristotle’s. The Christian

revelation holds that the cosmos has a beginning and an end. The genesis of the whole is a creative act of God; the terminus of the whole is described in a revealed eschatology. Aristotle’s eternally cyclical prime motion and the prime mover (pure actuality or thought thinking about thinking) are incompatible with this description, and in scholastic treatment the prime mover becomes a “first” mover. The divine is defined not by the most simple continuous motion, but (and only partly) by the initial motion which imparts motion to all the rest.

THERE ARE MANY OTHER FEATURES OF scholastic Aristotle that are different from unalloyed Aristotle. For example, a doctrine of angels must be accommodated, elevating Aristotle’s notions of the incorporeal to a plane that simply cannot be found in Aristotle’s system of thought. Indeed, Feser, in a sidebar, briefly discusses the knowledge of angels as the instantaneous and incorruptible knowledge of incorporeal beings. He doesn’t digress into these more theistic concepts, but the serious secular reader is bound to react allergically to supernatural data in the science of *Aristotle’s Revenge*. As another example, the scholastics added the notion of prime matter, which they thought Aristotle’s hylemorphism implied (i.e., his theory that every being is a



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compound consisting of some form and the matter out of which that form is made). Feser deploys prime matter throughout *Aristotle's Revenge* as a plank against reductionism. Prime matter is the universal stuff of things, or matter with no substantial form of its own out of which all other matter is composed. Aristotle has no such concept of prime matter. A concept of prime matter would confine the examination of things to an ultimate, single, speculative, and unobservable category of matter, and Aristotle's science is rooted in observable experience, which lends it great flexibility to examine new experiences.

THERE ARE, IN ADDITION, SCHOLASTIC modifications to Aristotle's *psychē*, the form of a living thing which gives it life—imperfectly translated as “soul.” Unalloyed Aristotle's *psychē* is eternal for human beings only in the very limited respect of the isomorphism—the structural or formal similarity—of humanity's active intellect and the eternal prime motion: all humans participate in a kind of motion called contemplation, which is the same as the prime motion. But though this motion goes on eternally, our personal participation in it does not: each particular intellect, the individual form of a human being, ceases to exist upon that human being's death. Scholastic Aristotle's human soul (rendered in Latin and freighted with new meaning as *anima*) is immortal and retains its particular knowledge for eternity—an essential feature of eternal punishments and rewards for bad and good particulars. Scholastic Aristotle sees all human purpose—indeed all creation—as organized toward this end of immortality and happiness in the next life.

The coming into being of man thus requires a doctrine of providence, because a specific intervention—a miracle—is needed to create a human being with a particularized immortal soul. Feser expressly discusses this concept of Aristotelian theistic evolutionism, writing: “special divine action would be required to introduce a distinctively human substantial form.” But there is no basis for this in Aristotle's system of thought, nor in any system of thought parallel to Aristotle's absent revelation. In the final analysis, the schoolmen's Aristotelianism is changed from a flexible account of the whole consistent with common sense and empirical fact (“with a true view the data harmonize”—*Nicomachean Ethics*, Book I) to a highly doctrinal system that derives its truth from divine authority.

Feser opens his book by setting out what he calls the “philosophy of nature.” Although Aristotle does not write of a philosophy of nature, Feser finds this category useful because it isolates discrete concepts of metaphysics,

and to a lesser extent physics, into a single category. Feser's philosophy of nature advises as to “what any possible empirical and material world must be like. What must be true of any possible material and empirical world in order for us to be able to acquire scientific knowledge of it?” This branch of metaphysics (as Feser identifies it) thus forecloses thought of some phenomena (some undiscovered and some observed) as impossible. Such a foreclosure is, however, not Aristotelian. Aristotle is open to reflection on new observations in a way that Feser's account, which invites the development of doctrine, is not. How else could the truth and data harmonize in a world aflood with new data? This foreclosure thus makes the Aristotle of *Aristotle's Revenge* a weak competitor with modern science, which has no such limitations. A less rigid approach would, in fact, be more Aristotelian, more consistent with the notion of cumulative scientific knowledge, and make a superior challenge to the reigning scientific *vulgata*.

IN BOOK I OF THE *METAPHYSICS*, ARISTOTLE describes metaphysics as a distillation of the desire to know—a science that examines the first principles of things, their being, in a way that is “not instrumental to something else” but rather an object of pure study as an end in itself. Aristotle accordingly saw physics as a science which could competently assume the correctness of commonsense experience in the study of nature, *without investigation of first principles*. Such investigation was simply not necessary to physics. If it had been, Aristotle's metaphysics would have been instrumental to something else, advising on what could and could not be considered in physics.

Feser frequently asserts that proponents of various modern scientific theories “owe” a response to his arguments about the philosophy of nature. But this is not a business they consider themselves to be in: natural scientists are not concerned with what should not or may not be. They are concerned with what is, according to their best efforts at observation. Aristotle's metaphysics establishes no debtor and creditor relationship in thought. Metaphysics, for Aristotle, has the fewest dependencies, because it is undertaken for its own sake.

This brings us full circle to Machiavelli and his critique of the thought of his time. The social science of the early 16th century grounded itself on interwoven doctrines of Aristotle and Christianity which deemed certain political actions to be impermissible. The natural science of the era similarly grounded itself on blended doctrines which deemed certain phenomena—even those actually observed, like the earth's revolutions around the sun—to be impossible. In the eruption of Enlightenment

thought that began with Machiavelli, Thomas Hobbes, René Descartes, and Francis Bacon, Aristotle was attacked, often viciously.

Feser sees Enlightenment hostility toward Aristotle as motivated by the desire to undermine the Church. But he might consider whether such attacks were less against the Church and Christianity *per se* and more against falsely pious doctrines that inhibited both political prudence and the desire to know, frustrating the actualization of human potential in both reflection and choice.

ONE MAY ADMIRE AQUINAS'S PHILOSOPHIC thought and yet ask these questions without impiety. Perhaps what began with Aquinas as disputed questions intended partly to moderate Church doctrine had become a drumbeat of “I answer that,” lending a patina of rationality to what was no longer reasoned. The value of Aristotle's thought, as well as of Christian piety, might have been obscured by their transubstantiation through three centuries of schoolmen's alchemy.

Insofar as *Aristotle's Revenge* is an attempt to cause modern science to acknowledge or embrace Aristotelian thinking, I do not judge the book to exact much in the way of vengeance. Modern science is—and modern scientists are—mostly materialist. Modern science does informally employ, and indeed, as Feser observes, depends upon, many concepts borrowed from the four causes which Aristotle examined. Indeed, one will find that small pockets of modern science are deep into some variations on incorporeal substances. String theory, for example, has a notion of branes (short for membranes), conjured from the mathematical demands of the theory but never observed, which are imagined to propagate through space-time. Branes would be in good company with the angels of the 13th century. But most of today's physicists and biologists will not examine or acknowledge their debt to the philosopher if they are scolded with medieval arguments about the impossibility of phenomena. Only a few of Feser's arguments, Aristotelian or otherwise, are likely to be compelling for anyone not already committed to an orthodox appreciation of Christian revelation. If Aristotle is to have “revenge” in metaphysics—if that is even desirable—I suspect it will come not from reiterations of the positions of the schoolmen, but from the re-characterization of Aristotle in ways that illustrate, in terms modern science understands (e.g., in math and symbolic logic and the like), the relevance of his thought to modern humanity.

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