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Platonism in early modern natural philosophy:

The case of Leibniz and Conway

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Platonism played a much more significant role in the development of the new natural philosophy in the seventeenth century than has generally been understood. While historians acknowledge Platonist leanings in the thought of figures ranging from Descartes and Berkeley to Schopenhauer and Hegel, the precise relation of these thinkers to that ancient tradition has not been analyzed in any detail.[1] And while the relation between the 'mechanization of the world picture' and Platonism has been noted,[2] the exact role that Platonist assumptions about mind, soul, and God played in the development of the new account of nature remains inadequately explored. There is an enormous amount of scholarly work yet to be done to excavate the Platonist foundations of early modern thought.[3]

This paper displays the crucial role that some Platonist doctrines played in the natural philosophy of two seventeenth-century philosophers: Gottfried Wilhelm Leibniz (1646–1716) and Anne Finch Conway (1631–1679). The Platonism of Leibniz and Conway reveals a good deal both about the precise use of such doctrines in grounding the new natural philosophy and the motivations behind doing so.

To begin to understand the relevance of Platonist metaphysical assumptions in the development of the new natural philosophy, there needs to be a good deal of

[1] For important exceptions, see Menn (1998) and many of the papers in Hedley and Hutton (2008), especially Van Ruler (2008).

[2] See classic treatments of the period such as Middleton (1963), chapters 4–5, esp. 55–7; Dijksterhuis, (1961) *passim*; and esp. Burtt (1954). It is noteworthy that such historians never speak of Plotinus and the role of his thought in the development of the views that interest them, though they often emphasize the importance of Pythagoreanism. See, dor example, Koyré (1957), esp. 30 and 59.

[3] Some recent work has begun to explore the Platonist sources and principles of the early modern period. See, for example, O'Neill (1993); Jones (2006), esp. Part III; Antognazza (2009), *passim*. For a grand study of Platonism and modern thought, see Schmitt (2003).

stage-setting. The first three sections do this preparatory work, while the fourth and the fifth use this material to excavate central elements in the natural philosophy of Leibniz and Conway.

Background: from medieval to early modern Platonism

There are two main obstacles to assessing the influence of Platonism in the early modern period. One of these is not particular to the period: namely, that there is no neat set of necessary and sufficient conditions that constitute Platonism. As the great scholar of Renaissance Platonism, Paul O. Kristeller, observes:

> Yet if we examine the actual ideas of those thinkers who have professed their indebtedness to the Athenian philosopher or who have been called Platonist by themselves or by others, we do not only find, as might be expected, a series of different interpretations and reinterpretations of Plato's teaching and writings; we are also confronted with the puzzling fact that different Platonists have selected, emphasized, and developed different doctrines or passages from Plato's works. Hardly a single notion which we associate with Plato has been held by all Platonists . . . Thus it is possible for two thinkers who have been conventionally and perhaps legitimately classified as Platonists to have very different philosophies, or even to have not a single specific doctrine in common.[4]

To make matters worse, the doctrines most often associated with that tradition (for example, the theory of Forms, the sharp distinction between the immutable realm of being and mutable realm of becoming) often constitute only one ingredient in elaborate philosophical systems. Again, Kristeller succinctly describes the problem:

> We must resign ourselves to the fact that in most cases the Platonist elements of thought are combined with doctrines of a different origin and character, and that even the professed Platonists did not express the thought of Plato in its purity, as modern [twentieth-century] scholars understood it, but combined it with more or less similar notions that had accrued to it in late antiquity, the Middle Ages, or more recent times.[5]

Given that Platonist doctrines were interpreted in radically different ways in the fifteenth, sixteen, and seventeenth centuries, and that early modern thinkers were happy to combine ideas from diverse sources, the task of identifying and then tracing the divergent paths of Platonism through the period is especially hard. While a detailed map of the period cannot be presented, a few historical facts and doctrinal details will help situate Platonism in the natural philosophy of Leibniz and Conway.

[4] Kristeller (1979), 50. [5] Kristeller (1979), 65.

Medieval Platonism

Despite the ascendancy of a Christianized Aristotelian philosophy in the twelfth and thirteenth centuries, medieval Europe was thoroughly familiar with Platonism, both before and after that ascent. The medieval conception of the world and its divine source is rooted in Platonist ideas and assumptions. Medieval philosophers differ greatly both in the degree and explicitness of their endorsement of Platonism, but Platonist views about God, nature, causation, and knowledge are part of the intellectual currency of medieval Europe. The vitality of Platonism in the Latin west is striking, especially since so very few works by Plato himself were available. As Brian Copenhaver and Charles Schmitt have noted, 'the thin state of direct knowledge of Plato . . . surprise modern observers accustomed to Plato's celebrity'.[6] Only the *Meno*, the *Phaedo*, some of the *Timaeus*, and a piece of the *Parmenides* existed in Latin translation, and only the *Timaeus* was widely obtainable. Dialogues as important as the *Republic*, *Symposium*, and *Theaetetus* were unavailable to the Latin west, and had to be 'rediscovered' in the Renaissance. Moreover, the Aristotelianism imported to Europe from the Arab world in the thirteenth century was mixed with Platonism. Scholasticism resulted from the blending together of this Platonized Aristotelianism and medieval Christianity which itself was rooted in Platonism. Besides the fact that most scholastics based their interpretations of Aristotle's texts on Latin translations, there were a number of pseudo-Aristotelian works, some of which were thoroughly Platonized (such as *Liber de causis*). Thus, despite the philosophical subtlety of many scholastic thinkers and despite their commitment to the philosopher, they promulgated an Aristotelianism imbibed with a good deal of Platonism.[7] As Copenhaver and Schmitt write about Thomism: 'Given the quantity of Platonic material transmitted' through Arabic authorities 'or generally in the air in medieval universities, it is not surprising that parts of Thomist metaphysics owe more to Augustine, Proclus, or Plotinus than to Aristotle'.[8] This remained true throughout the early modern period when philosophers committed to Aristotle absorbed Platonist ideas.

Marsilio Ficino

The great Renaissance humanist, Marsilio Ficino, was the main source for the early modern Platonism. At the beginning of the fifteenth century, few thinkers in the Latin west had access to Plato's dialogues; by the end of the century, thanks to Ficino's

[6] See Copenhaver and Schmitt (1992), 15.

[7] Some recognizable Platonist doctrines appear in various forms in a wide range of scholastic thinkers. For Aquinas' commitment to plenitude, for example, see Thomas Aquinas, *Summa Contra Gentiles,* in Anderson (1975), II, §45. For Suárez's use of the causal doctrine of emanation, see *Disputationes metaphysicae* 18, §3. Plenitude and emanation will be discussed in what follows.

[8] See Copenhaver and Schmitt (1992), 133.

editions and translations, all of Plato's texts were in print.[9] Not only did Ficino produce the first Latin edition of Plato, his commentaries and interpretations form the background against which sixteenth- and seventeenth-century Platonism must be seen. Paradoxically, Ficino's interpretations owe as much to the thought of Plotinus, whose works he also translated, as Plato himself. His *Theologia Platonica, de immortalitate animorum* is a vast work that endorses the more thoroughgoing (and mystical) philosophy of Plotinus than the 'divine Plato'.[10]

Two passages from his *Theologia Platonica* of the early 1470s are particularly important here: 'Between those things that are exclusively eternal and those that are exclusively temporal, there is a soul.' Moreover, this soul is always 'alive', and is such that it 'causes life to be diffused among bodies.' Ficino says that he is following 'the Platonists' when he maintains that an entity is 'most perfect when its constituent parts cohere' so that 'it is one [unum] in all respects, consistent with and in harmony with itself [sibi constet et consonet].'[11] For Ficino, each soul is something that is fundamentally vital and whose vitality entails that it is a self-sufficient and unified thing. The soul receives its vitality from God and then is capable of transmitting it to bodies within its causal range. Employing the standard Platonist metaphor of the sun and light, he writes that

> the soul acts in the same way as the light of the sun. The light descends from the sun to fire and fills [implet] fire, nor does it [the light] leave the sun. It always inheres in the sun and always fills fire . . . In the same way, the third essence [the human soul] must inhere in the divine and fill whatever is mortal at the same time . . . While it fills bodies, it bestows life on them, because it moves them from within. Thus, it is the mirror of the divine, the life force of the mortal and the connecting link between the two.[12]

For Ficino, God resides at the top of a hierarchy of being, extending the divine vitality and power to all creatures. There are five levels of being, each causing and explaining the one that follows it.

With the reinvention of Platonism in the fifteenth and early sixteenth centuries, philosophers absorbed Platonist ideas in a number of ways. Ardent followers of

[9] For more on this history, see Copenhaver and Schmitt (1992), esp. chapters 1 and 3.

[10] Much has been written about Ficino, and his thought and influence. A fine place to begin an exploration of these topics is Allen *et al.* (2002). Also see Garfagnini (1986).

[11] Ficino *Theologia Platonica, de immortalitate animorum* III, §2, 43r–43v (= Hankins and Bowen (2001–), 235–6).

[12] Ficino, *Theologia Platonica, de immortalitate animorum*, III, §2: 'Immo vero idem facit quod solis lumen. Id enim a sole descendit in ignem et ignem implet, neque deserit solem. Semper soli haeret, semper implet et ignem. Inficit quidem aerem et infecto aere non inficitur. Similiter oportet essentiam tertiam et divinis simul haerere et implere mortalia. Dum divinis haeret, quia spiritaliter illis unitur et spiritalis unio gignit cognitionem, illa cognoscit. Dum implet corpora, intrinsecus illa movens, illa vivificat. Est igitur divinorum speculum, vita mortalium, utrorumque connexio' (43r–43v) (= Hankins and Bowen (2001–), 231–47).

Aristotle turned to that tradition when the Philosopher failed or needed reinforcement.[13] And even Platonists, like the great Ficino himself, were prepared to use Aristotelian notions when the time seemed right.[14] The borders between Platonism and Aristotelianism were very porous.

Conciliatory eclecticism

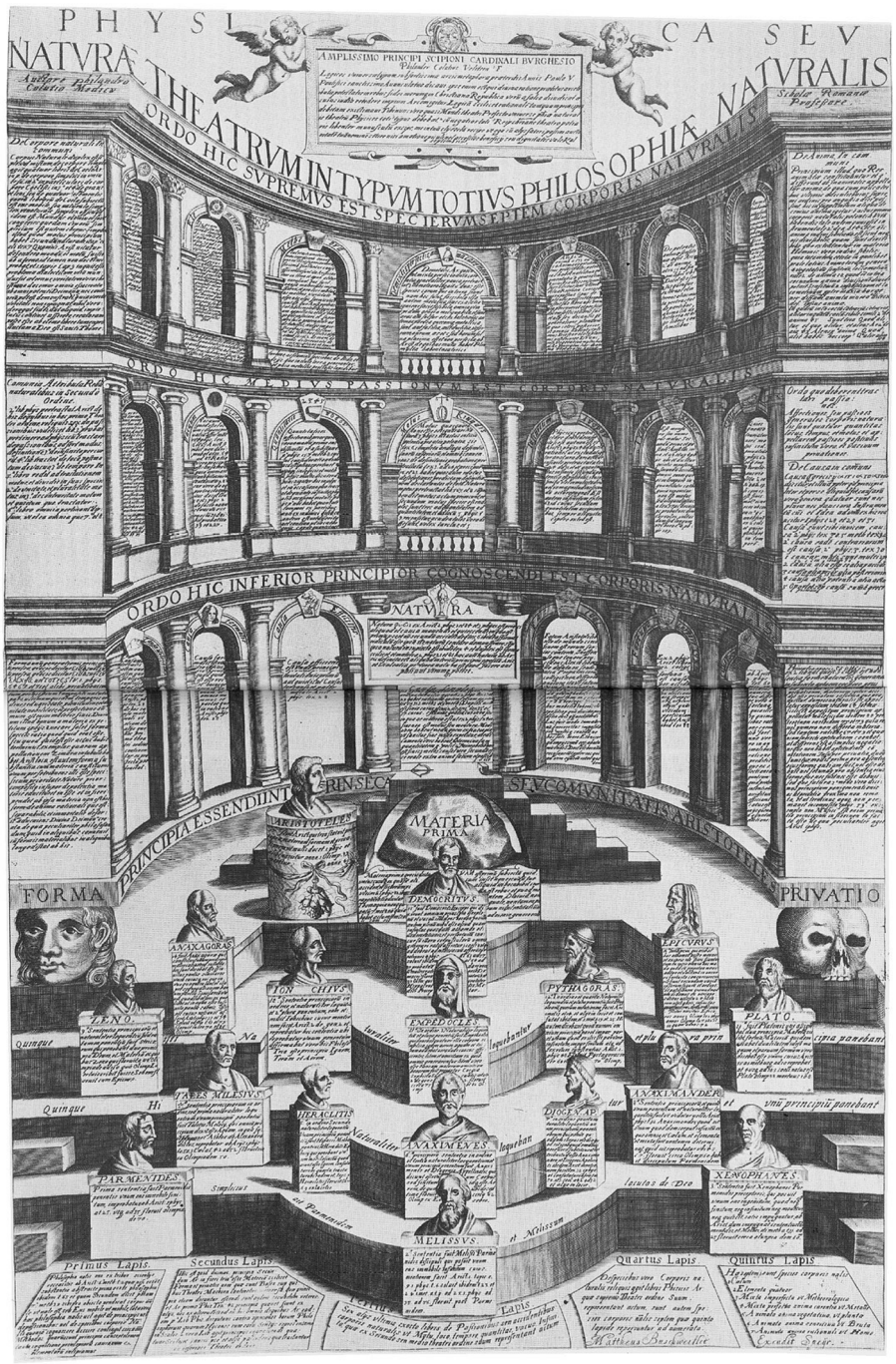
Many early modern thinkers practiced what I call *conciliatory eclecticism*: they assumed that elements of the major schools of philosophy could be combined to form a coherent and *true* philosophical system. For such conciliators, the assumption was that the diverse philosophical traditions were not as incompatible as they first appeared, the goal was to forge conciliation among the worthy schools, and the result was a mixture of ancient and modern ideas. The appeal of conciliatory eclecticism persisted through the seventeenth century. Even though many were committed to finding a new method that would secure philosophical certainty, many others sought security in building a 'new' philosophy (at least partly) out of traditional elements. The proffered conciliatory strategies are wonderfully diverse.[15]

As vivid evidence of this diversity, consider two engravings. The first, *Physica seu Naturae Theatrum Typum Totius Philosophiae Naturalis* (1611), was designed by Philander Colutius, a Roman Professor of Medicine at the Gymnasio Romano, and engraved by Matthäus Buschweiler in Speyer. Busts of ancient Greek philosophers are positioned on a series of steps. These include Zeno, Anaxagoras, Parmenides, Pythagoras, and Plato. Aristotle occupies a privileged position on the top step, where a rock symbolizes the principle of prime matter, a head the principle of form, and a skull the principle of privation. The steps lead toward a three-tiered colonnaded theater. Each tier represents an 'order' of nature. The overall suggestion is that despite the primacy of Aristotle and his principles, all these ancient philosophers contribute to a proper account of nature.

[13] See Blackwell and Kusukawa (1999). Several papers in this collection document the complicated ideas from various sources—often Platonist—that found there way into the work of thinkers usually categorized as Aristotelian. A good example is the paper that shows how Jacob Shegk, a 'loyal defender of Aristotle', turns to Platonist notions of mind in a work of 1546. See Kusukawa (1999), 175–7.

[14] Throughout his *Theologia Platonica,* Ficino relies on Aristotelian notions and terms to help him explicate his Platonist philosophy. What is even more striking perhaps is the fact that self-proclaimed seventeenth-century Platonists such as Ralph Cudworth do so as well. See Hutton (1999).

[15] For a helpful discussion of the variety of philosophical options available among Protestant reformers, see Leinsle (1988).


PHYSICA SEV
NATVRAE THEATRVM IN TYPVM TOTIVS PHILOSOPHIAE NATVRALIS
AMPLISSIMO PRINCIPI SCIPIONI CARDINALI BVRGHESIO
ORDO HIC SVPREMVS EST SPECIERVM SEPTEM CORPORIS NATVRALIS
ORDO HIC MEDIVS PASSIONVM EST CORPORIS NATVRALIS
ORDO HIC INFERIOR PRINCIPIORVM COGNOSCENDI EST CORPORIS NATVRALIS
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PRINCIPIA ESSENDI INTRINSECA SEV COMMVNITATIS ARISTOTELIS
ARISTOTELES
MATERIA PRIMA
DEMOCRITVS
FORMA
PRIVATIO
ANAXAGORAS
ION CHIVS
EMPEDOCLES
PYTHAGORAS
EPICVRVS
PLATO
ZENO
THALES MILESIVS
HERACLITIS
ANAXIMENES
ANAXIMANDER
DIOGENES AP
XENOPHANES
PARMENIDES
MELISSVS
Primus Lapis
Secundus Lapis
Tertius Lapis
Quartus Lapis
Quintus Lapis

The second engraving is the frontispiece of Robert Balfour's *Commentari[a] R. Balforei in Organum logicu[m] Aristotelis* (1618). Plato and Aristotle are labeled by inscriptions beneath their feet. They stand in niches flanking text that identifies the book's title and author. Plato points upwards and grips a book in his right hand, while Aristotle's right hand holds a writing implement. Above Plato and Aristotle, standing in the center of architectural structure's roof, is the personification of Logic,

who is also labeled by an inscription beneath her feet. She holds a scale that weighs the truth.[16]

By the mid-seventeenth century, the new mechanical philosophy of Galileo, Descartes, and Gassendi had gained enormous popularity. But even this philosophy was often combined with more traditional elements. The result was a startling number of philosophical options and a wide array of zealots who argued passionately for their side and against the other.[17] In the third quarter of the century it was common for philosophers to complain about the sectarianism of their time and to offer conciliatory philosophy as a remedy.[18]

Johann Christoph Sturm's (1635–1703) *Eclectic Philosophy* nicely represents what happens to the conciliatory methodology when charged with the task of assimilating the new natural philosophy. Like many of his conciliatory colleagues, Sturm worries about the 'envy and malice' of his contemporaries and especially of the Cartesians.[19] Sturm intends 'to pounce upon those who are hostile to one another'—whether to the ancients, moderns, or skeptics—and prove that as long as they 'do not open their eyes' to what is valuable in the other systems they will remain 'cut off' from the truth.[20] According to Sturm, the only means to 'true wisdom' is to take seriously all sources and all methods.[21] He insists that his approach is not 'to collect ideas indiscriminately', but to seek 'a variety of opinions' and employ 'any method' so that 'the whole of Nature and Reason' becomes available.[22] For Sturm, the most authoritative leaders are Descartes, Gassendi, Plato, and Aristotle, but he also maintains that if we want to understand 'the phenomena of Nature' we must learn from 'other great Men', like Bacon, Boyle, Harvey, De Raey, and Weigel.[23] He applauds the advances of these new thinkers and their new discoveries (the circulation of the blood, for example), but insists that their contributions depend crucially on the work of the ancients and especially of Aristotle.[24] In order to grasp 'the whole wonderful immensity of Nature' we must combine the 'strength and power' of all available sources into a coherent system.[25] Only the proper eclectic philosophy can discover the truth among 'the many

[16] I would like to thank Susanna Berger for tracking down these images and for help with deciphering them. For much more of where this came from see her PhD dissertation, *The Art of Philosophy: Seventeenth-Century Aristotelian Thesis-Prints and Illustrated Student Notebooks* (forthcoming). For another striking image of the close philosophical relation assumed between Aristotle and Plato by many in the seventeenth century, see my account of Johann Adam Scherzer in Mercer (1999). In the 1660s Scherzer was a prominent professor at the University of Leipzig. The frontispiece of his *Vade mecum sive manuale philosophicum quadripartitum* [*Vade mecum*] contains two robed figures—one marked Aristotle, the other Plato—who hold a sphere on which a triangle is inscribed and from which divine and natural knowledge apparently flow. In *Vade mecum*, Scherzer relies on a whole long list of Platonists (including Ficino), scholastics, and Aristotle himself to offer the proper truths of philosophy.

[17] For a ground-breaking discussion of some of these options as they evolved in French universities, see Brockliss (1981) and (1987).

[18] For example, Scherzer complains about the period's 'pernicious' controversies. See *Vade mecum*, *Dedicatio* [iv].

[19] Sturm *Phil. Ecl.* 161–5. For a fuller account of Sturm and of conciliatory eclecticism, see Mercer (2001), 27–59 and 99–109.

[20] Sturm *Phil. Ecl.* 2–3. [21] Sturm *Phil. Ecl.* 16–22. [22] Sturm *Phil. Ecl.* 7–8.

[23] Sturm *Phil. Ecl.* 117. [24] Sturm *Phil. Ecl.* 41–2. [25] Sturm *Phil. Ecl.* 186f.

and diverse' sources and then demonstrate 'the one true and genuine philosophical foundation'.[26] With his conciliatory methodology clearly articulated, Sturm attempts to use it in the remainder of his book. He proposes that many of the basic elements of the Cartesian and Aristotelian systems are fundamentally similar and explains that this has not been obvious due to bad translations and inadequate interpretations of the ancient texts.[27] He argues, for example, that Aristotle's conception of matter, when properly understood, can be seen to be the same as Descartes'.[28]

Some Platonist doctrines

There is no neat set of doctrines that comprise early modern Platonism. Lloyd Gerson has made a similar point about the Platonism of late antiquity. He articulates a series of features 'common to virtually all varieties of Platonism', emphasizing a 'top-down metaphysical approach' that appeals to 'irreducible, intelligible principles'.[29] For our purposes it is enormously important that some of the doctrines that Gerson articulates are ones that many twentieth-century scholars would not recognize as strictly out of Plato. As Gerson writes: 'In trying to understand what Platonism is, we must, therefore recognize that Platonism is, in a sense, bigger than Plato.' Gerson's warnings about ancient Platonism apply with equal force to the early modern period: in the history of philosophy, many of the doctrines associated with Platonism are not found in the texts of Plato himself. So, scholars of early modern philosophy will not be able to discern the rampant Platonism of the period unless they look beyond those texts. In fact, many of the doctrines that early modern philosophers identified with Platonism are found more thoroughly articulated in thinkers like Plotinus and Proclus than in Plato himself. Scholars should also not expect early modern figures to agree on what Platonist assumptions are most central.[30] The diversity of opinions about Platonism was extreme.

But there are some metaphysical commitments whose endorsement reveals Platonist sources and assumptions. The doctrines listed here constitute the materials out of which many seventeenth-century thinkers built their natural philosophy. In particular, these doctrines play a significant role in the metaphysics of Leibniz and Conway.

1. *The Supreme Being*. God is the most perfect, self-sufficient, unified, and real being. These attributes are usually associated with the nature or essence of God. But God

[26] Sturm *Phil. Ecl.* 192; see also 189. [27] Sturm *Phil. Ecl.* 76f.

[28] Sturm *Phil. Ecl.* 261–4. This is not as odd as it first seems. There were many other prominent seventeenth-century philosophers who agreed. See the Dutch philosopher, Johannes De Raey, *Clavis Philosophiae Naturalis sive Introductio ad Contemplationem Naturae Aristotelico-Cartesiana*, Leiden: J. and D. Elsevier, 1654, and the German thinkers, Erhard Weigel, *Analysis Aristotelica ex Euclide Restituta*, Jena, 1658, esp. 2–4, 94, and 108–9. On De Raey, see Verbeek (1992), esp. 70–88, and Mercer (1997). On Weigel, see Mercer (1999). For the complicated history of Cartesianism, see Bouillier (1868).

[29] Gerson (2005), esp. 255–7.

[30] Well into the eighteenth century, philosophers had different versions of Platonism, and some individual thinkers could contemplate a variety of 'Platonisms'. See Jaffro (2008).

is also often considered to be a mind or intellect that conceives essences, which are modeled on Plato's forms or 'Ideas' (such as Justice). God is supposed to conceive these essences or Ideas, which then act as paradigms for creation.

2. *Emanation and hierarchy*. God produces the world through emanation. In emanating the world and its creatures, God is not changed, and yet creatures acquire the divine attributes and the essences. Each of the attributes of perfection, self-sufficiency, unity, and being is a function of the other in the sense that the more perfection something has, the more unity, and so on. God is a causal principle that explains the thing (or things) it immediately produces; these products themselves can then act as the causal principle for other things. The result of this two- (or more) tiered process of emanation is a hierarchy of being.[31] At each level in the emanative hierarchy, the higher level emanates its attributes or 'Ideas' (for example, Justice) to the lower level in such a way that neither the higher entity (the cause) nor its attribute is depleted in any way, while the lower entity (the product) comes to instantiate the attribute, though in a weaker or inferior manner. The emanative process is continual so that the lower entity instantiates the attribute just as long as the higher emanates the attribute to it. Given that God has the highest degree of perfection, self-sufficiency, unity, and reality, and given that the 'Ideas' (such as Justice) that God contains are perfect, the emanative relation entails that each product of God exists at a lower level of being than God and has a lesser degree of perfection, self-sufficiency, simplicity, reality, and so on. For many early modern Platonists, the products of God's emanation contain all the divine attributes (or 'Ideas'), though in a manner inferior to the way in which they exist in God.

An example might help. For many philosophers in the Platonist tradition, God conceives the perfect essence: say, Justice. God has justice perfectly and justice is therefore an attribute (or Idea) of God. When God produces the world, the world itself and all its creatures acquire justice. Each creature, then, has a degree of justice. Socrates, as a product of God, receives and instantiates justice; so does Bo, the dog, although Bo instantiates justice at a degree lower than does Socrates. But how exactly is God supposed to be related to the whole of creation as opposed to each individual creature produced?

3. *Cosmic unity*. Philosophers in the Platonist tradition differ about which attributes are primary, but most agree that they include unity, self-sufficiency (sometimes understood as causal agency), and perfection. Thus, God emanates unity to every individual creature, and to the whole of creation. By such means, there is unity in the totality of creatures. Not only does every individual creature have unity, the collection of creatures does as well. As Gerson writes: 'These philosophers held that the world is a unity in the sense that its constituents and the laws according to which it operates are really and intelligibly related.'[32]

[31] For the classic account of the history of this idea of a 'great chain of being', see Lovejoy (1936). For a very helpful account of this emanative process that results in such a hierarchy, see O'Meara (1996).

[32] Gerson (2005) 258.

4. *Harmonized Plenitude and Enhancement*. God emanates perfection and being to the world. The goodness of the world is partly a function of the variety of the creatures within it, partly a function of the sum of the goodness of the creatures within it, and partly a function of the order among those creatures where the latter is understood primarily in terms of the enhancement relation among them. Many thinkers believed that (some or all) created things have an enhancement relation with (some or all) other creatures. When two creatures are in an enhancement relation, an increase in the goodness of one will promote an increase in the goodness of another, although the relation is non-reciprocal (that is, the increase in second will not then promote an increase in the first).

5. *Souls*. Individual souls receive their self-sufficiency, unity, perfection, and being from God. As the section on Ficino suggests, souls have the power and the vitality that they have because God emanates these attributes. Souls receive power from God, and then act by emanating it. In a sense, they are conduits of the primary divine attributes of perfection, unity, self-sufficiency, and reality. In acting, they also instantiate Ideas like justice.

Background: early modern natural philosophy

Early modern thinkers were motivated to use Platonism for a whole variety of reasons. One prominent use of Platonism was to solve problems generated by the new mechanical philosophy. In order the grasp the impact of Platonism on early modern natural philosophy, a little more stage-setting needs to be done: a brief review of scholastic natural philosophy and a presentation of the new mechanical philosophy that was supposed to replace it.

Scholastic natural philosophy

Despite the genuine differences among scholastic philosophers, most would agree to the following claims: nature is full of substances, which act and are acted upon; concrete individual substances are constituted of two principles, matter and form; substantial form is the active principle in that it is the source of change in nature; matter is the passive principle in that it has the capacity to receive and retain the changes conferred; the substantial form of a corporeal substance possesses innate powers that incline the substance to behave in characteristic ways (fire, for example, contains the innate power to heat and to rise, while rocks possessed the tendency to fall); and the substantial form grounds (for some scholastics, the passive principle plays a role here too) the unity and identity of the individual concrete thing.[33] What is particularly important is that substantial forms do a lot of metaphysical work: among other things, they are a

[33] For some of the most recent scholarship on the differences among scholastics on some of these central issues, see Pasnau (2010).

crucial part of an account of identity through time, individuation, substantial unity, and so on.[34]

For Christian thinkers, the metaphysical features of unity and identity are particularly important because they help explain central theological doctrines such as the resurrection of the body, and the Eucharist.[35] As Aquinas writes in the *Summa contra Gentiles*:

> For one thing to be another's substantial form, two requirements must be met. First, the form must be the principle of the substantial being of the thing whose form it is; I speak not of the productive but of the formal principle whereby a thing exists and is called a *being*. The second requirement then follows from this; namely, that the form and the matter be joined together in the unity of one act of being . . . And this single act of being is that in which the composite substance subsists: a thing one in being and made up of matter and form.[36]

Aquinas is just one among many prominent scholastic thinkers. Despite the real differences among them in the details of their metaphysics, they all assigned a good deal of work to substantial forms as the active principles in nature.

The mechanical natural philosophy

Proponents of the new mechanical philosophy—whether Galileo, Descartes, Gassendi, or lesser figures—intended to rid nature of substantial forms and replace it with an improved explanatory model. According to the mechanical philosophy, nature is composed of matter—whether the *res extensa* of Descartes, the atoms of Gassendi, or one of the many less popular accounts of corporeity—whose actions and movements cause and explain all the phenomena of nature. For the mechanist, therefore, all physical phenomena are to be explained in terms of some kind of matter and motion.

In his *Principia Philosophiae* of 1644, Descartes offers his account of 'the entire visible world'. According to Descartes, there is 'no phenomenon of nature' that cannot be explained by the principles enumerated in his treatise: namely, 'the various sizes, shapes, and motions which are found in all bodies.'[37] According to Gassendi in the *Syntagma* of 1658,

> the matter of the world and all the things contained in it is made up of atoms . . . which God created finite from the beginning, which he formed into this visible world, which, finally, he ordained and permitted to undergo transformations out of which, in short, all the bodies which exist in the universe are composed'.[38]

[34] For an excellent account of some of these issues, see Pasnau (2004).

[35] To acquire a sense of the complicated relation between scholastic metaphysics and Christian doctrines such as the Eucharist, see Bakker (1999).

[36] Aquinas, *Summa Contra Gentiles*, II, §68 [2–3].

[37] René Descartes, *Principia Philosophiae*, IV, §199, in vol. IXB of Adam and Tannery (1964–74) [AT], and in Cottingham, Stoothoff, and Murdoch (1988).

[38] Gassendi, *Syntagma Philosophicum*, *Physica*, Sect. I, Bk III, §8, in Gassendi (1658), vol. I, and in Bush (1972) at 399.

That is, for Descartes, Galileo, Gassendi, and other 'new philosophers', physical bodies are parcels of matter in motion. All the real and apparent features of a body (its shape, size, solidity, color, taste, texture, and so on) are explained by means of the size, shape, position or configuration, and motion of its constituent material particles.[39] The original proponents of the 'new philosophy' proclaimed the incompatibility of Aristotelianism and their own new philosophy. As Descartes writes to Mersenne: 'for I see that it [the Aristotelian philosophy] is so absolutely and so clearly destroyed by means of the establishment of my philosophy alone, that no other refutation is needed'.[40] By the 1660s, for natural philosophers scattered across Europe, the 'occult' and 'incomprehensible' substantial forms had to be rejected and the mechanical physics endorsed.

For our purposes it will be helpful to distinguish between a first and a second wave mechanical philosopher. A *first-wave mechanist* is someone like Descartes, Galileo, Hobbes, or Gassendi, who proposed a version of the mechanical explanatory model before 1650, where the latter offers an account of natural phenomena by appealing to matter and motion. That is, an explanation of physical phenomena is consistent with the mechanical explanatory model just in case it appeals to some sort of matter, the features of that material stuff, and its motion. A *second-wave mechanist* is a philosopher working in the second half of the seventeenth century who accepts the mechanical explanatory model.

The philosophy of the first-wave mechanists generated a number of serious philosophical difficulties, which second-wavers attempted to solve. The solutions required a rethinking of the metaphysical underpinnings of mechanical physics. That is, many second-wave philosophers sought new and more stable foundations on which to stand the mechanical explanations of the first-wave mechanists. Historians of early modern philosophy have recognized that philosophers such as Malebranche, Leibniz, Spinoza, and Berkeley were dissatisfied with Cartesianism and other versions of the mechanical philosophy. But what has not been properly understood is that Platonist doctrines about God, emanation, cosmic unity, and soul offered materials that could securely ground the new physics.

Problems facing the first-wave mechanical philosophers

I do not mean to imply that Descartes, Gassendi, Hobbes, and Galileo considered themselves players on the same team. There are significant differences among them (for example, on the void, on the cause of motion, on the existence and nature of incorporeal beings, and so on). But this makes it all the more striking that their seventeenth-century successors often lumped them together. For example, Conway insists that the mechanical philosophers

[39] For a discussion of the physical explanations of the mechanical philosophers, see Nadler (1998). For a discussion of Hobbes, see Leijenhorst (2002).

[40] Descartes, AT III 470.

have generally erred and laid a poor foundation from the beginning . . . From such an absurd foundation, many other most crass and dangerous errors have arisen, not only in philosophy but also in theology with great injury to the human race, to the detriment of true piety, and in contempt of the most glorious name of God.[41]

Second-wave mechanists tended to solve the problems facing the first-wavers by one of two means: there were those who rely primarily on Aristotelian ideas for help, and those who were willing to reinvent parts of the Platonist philosophy to ground the new physics. Many Aristotelians (such as Jean-Baptist du Hamel, Johannes de Raey, and Johannes Clauberg) found very serious problems with the new mechanical philosophy and believed that Aristotelian ideas could be 'reformed' to solve them. For such philosophers, when the first-wave mechanists stripped nature of substantial forms, they removed the means to solve adequately problems such as identity through time and substantial unity. There was a flurry of activity to offer a metaphysics that would more securely support the mechanical explanatory model. Many of these Aristotelians turned Cartesian *res extensa* into prime matter (or passive principle), and made God the cause of the form (or active principle) of corporeal substances.[42]

Second-wavers with strong Platonist leanings also found the metaphysics of the first-wave mechanists inadequate, and set about forging a more stable metaphysical basis for the new explanatory model. For philosophers who endorsed versions of the Platonist assumptions about God, emanation, cosmic unity, and plenitude (articulated above in the section entitled 'Some Platonist Doctrines'), some problems seemed particularly severe.

The problem of passivity

When the first-wave mechanist stripped nature of substantial forms, they removed any obvious means of activating and unifying corporeal substances. Nature was no longer either inherently active or ontologically diverse. The sensory world might be full of varied phenomena, but all such variety was supposed to reduce to some sort of material component and its motion. Whether the matter of an individual body was defined as *res extensa* (Descartes) or as a collection of atoms (Gassendi), the matter itself lacked a source of activity. Descartes maintains that God 'preserves motion in matter', while Gassendi thinks that God infuses motion into atoms at their creation.[43] The first-wavers found different ways to put God into nature, but they mostly agreed that

[41] Anne Conway, *Principia Philosophiae Antiquissimae & Recentissimae*, Amsterdam, 1690, and *The Principles of the Most Ancient and Modern Philosophy* [*Principles*], eds. A. Coudert and T. Corse, Cambridge: Cambridge University Press, 1996, chapter 9, §1.

[42] For more details, see Mercer (1997) and (2001), esp. chapter 4.

[43] For Descartes' views about motion, see René Descartes, *Principia Philosophiae*, II, §37ff. Like his ancient predecessors, Democritus and Epicurus, Gassendi takes motion to be intrinsic to matter; but unlike them he thought God put motion into atoms. He writes: 'It may be supposed that individual atoms received from God . . . the requisite force for moving, and for imparting motions to others . . . All this to the degree that he foresaw what would be necessary for every purpose he had destined them for.' See Gassendi, *The Selected Works of Pierre Gassendi*, 400–1.

God was the immediate cause of activity in the natural world (Hobbes is a prominent exception). For any thinker who embraced the Platonist doctrines presented above (in the section 'Some Platonist Doctrines') about God, nature, and cosmic unity, the mechanical universe was deeply problematic. The Platonists' underlying concern may be expressed as follows: either matter is entirely passive (and therefore has no source of self-sufficiency) or it is active; if matter is entirely passive and lacking in self-sufficiency, then it would seem to lack all perfection, unity, and reality; if it is active, then the source must be something non-material. But then what is this non-material source of activity, and how does it activate and unify divisible matter?

In short, given Platonist assumptions about the attributes of God, cosmic unity, emanation, and especially self-sufficiency, a natural philosophy built on an infinitely divisible and totally inactive stuff must have seemed particularly problematic.

The problem of plenitude

Platonist views about plenitude insist that the goodness of the world is partly a function of the variety of the beings within it, partly a function of the sum of the goodness of the beings within it, and partly a function of the order among those beings. It is striking that purely passive matter is incapable of contributing to the goodness of the world in any of the ways noted here: it can have neither variety nor goodness nor order *per se*. Moreover, given its passivity, it is incapable of any sort of enhancement relation. Again, given Platonist assumptions about cosmic unity, harmonized plenitude, and the attributes of God, an account of nature rooted in uniform stuff must have seemed unimpressive.

There are other problems that motivated second-wavers with Platonist leanings to rethink the new philosophy. These two will suffice as an introduction to Leibniz and Conway.

Gottfried Wilhelm Leibniz (1646–1716)

For many second-wave mechanical philosophers, the only way to solve the problems facing the first-wave mechanists was to reconsider the role of God and minds in nature. Many philosophers made God the emanative source of natural activity. That is, they made nature active again by distributing divine power throughout it. In what follows I offer two prominent seventeenth-century figures as examples of second-wave philosophers who used Platonism as a major part of their metaphysics. First, let us consider the great Leibniz himself.

Leibniz as conciliatory eclectic

Leibniz was profoundly influenced by the methodological pronouncements of seventeenth-century conciliatory eclectics. Some of his most basic metaphysical beliefs

were taken directly from the Aristotelian, Platonist, and mechanical philosophies: that a substance is something wholly self-sufficient, that each creature is an emanation of God's essence, and that all corporeal features are to be explained mechanically are such truths. Leibniz's system is the result of the clever combining of these sorts of assumptions.[44] As such, it is a brilliant blending of ancient and modern doctrines. For matters concerning created substance, he borrowed heavily from Aristotelianism. But when it came to the details of the relation between God and creatures, Leibniz turned to the Platonist tradition. In his *New Essays on the Human Understanding*, written in 1703–05 in response to John Locke, Leibniz summarizes his methodology as follows:

> This system appears to unite Plato with Democritus, Aristotle with Descartes, the Scholastics with the moderns, theology and morality with reason. Apparently it takes the best from all systems and then advances further than anyone has yet done. . . . I now see what Plato had in mind when he talked about matter as an imperfect and transitory being; what Aristotle meant by his 'entelechy' . . . . How to make sense of those who put life and perception into everything . . . I see everything to be regular and rich beyond what anyone has previously conceived . . . Well, sir, you will be surprised at all I have to tell you, especially when you grasp how much it elevates our knowledge of the greatness and perfection of God.[45]

In the *Discours de Métaphysique* of 1686, Leibniz articulates how this methodology applies to his natural philosophy:

> I agree that the consideration of these [substantial] forms serves no purpose in the details of physics and that they ought not to be used to explain particular phenomena. In this the scholastics failed . . . thinking that they could account for the properties of bodies by mentioning forms and qualities, without taking the pains to examine the manner of their operation.

So, Leibniz stands with the mechanical philosophers and against the scholastics in the usefulness of substantial forms in explaining the particulars of physical phenomena. In this sense, he is a second-wave mechanist. But he also insists:

> But this misunderstanding and misuse of forms must not cause us to reject something whose knowledge is so necessary in metaphysics that, I hold, without it one cannot properly know the first principles or elevate our minds sufficiently well to the knowledge of the incorporeal natures and the wonders of God.[46]

[44] See Mercer (2001), *passim*.

[45] Gottfried Wilhelm Leibniz, *Nouveaux essais sur l'entendement* (of 1703–05) in *Sämtliche Schriften und Briefe* [Akademie], ed. Deutsche Akademie der Wissenschaften, Berlin: Akademie Verlag, 1923–, VI, vi, 71–3: 'Ce systeme paroit allier Platon avec Democrite, Aristote avec des Cartes, les scholastiques avec les modernes, la Theologie et la morale avec la raison. Il semble qu'il prend le meilleur de tous cotés, et que puis aprés il va plus loin qu'on n'est allé encore . . . Je vois maintenant ce que Platon entendoit, quand il prenoit la matiere pour un être imparfait et transitoire; ce qu'Aristote voiloit dire par son Entelechie . . . jusqu'où les sceptiques avoient raison en declamant contre les sens . . . Enfin vous serés surpris, Monsieur, d'entendre tout ce que j'ay à vous dire, et sur tout de comprendre combien la connoissance des grandeurs et des perfections de Dieu en est relevée.' For an English version, see Remnant and Bennett (1981).

[46] *Discours de Métaphysique,* §10 in Akademie, VI, iv [B], 1529–88.

Many of the 'necessary' metaphysical assumptions are those Platonist doctrines articulated above.[47]

The young Leibniz and Platonism

Very early in his long philosophical life, Leibniz became dissatisfied with the mechanical philosophy and turned to Platonism for help. He was particularly concerned to solve the problems of passivity and plenitude.[48]

In essays of 1668–71, Leibniz endorses Plato's view that the divine power is 'diffused through everything'.[49] He explains: 'The divine mind consists of the Ideas of all things' which are 'diffused in nature'. In fact, '[t]he Ideas of God and the Substances of things are the same thing but different in relation' to perfection. God shares the divine vitality and self-sufficiency with (at least) some creatures, each of which is a *vivens unum*, the living unity, which is indivisible and acts as 'a fountain of life'.[50] Thus, Leibniz follows his Platonist predecessors in modeling the nature and activity of created minds on God. He explains: 'Just as God thinks things . . . because they follow from his nature, so does [human] Mind . . . Mind and God do not differ except that one is finite and the other infinite'.[51]

The young Leibniz embraces the plenitude and cosmic unity of the world by filling creation with incorporeal beings.[52] He intends to avoid the unacceptable conclusion to which he thinks the mechanists are committed: namely, that 'the same matter is indeterminate' and everywhere the same.[53] Rejecting the idea that God's natural world is full of the same basic corporeal stuff, he fills the world with 'incorporeal beings': 'in everything there is a certain seminal center that is diffused throughout the thing.' This center is 'the fountain of life' and that 'in which the very soul is implanted.'[54] Nor is he content just to scatter active principles throughout nature. One of his most radical proposals is to place the whole world *in* each of these principles. The young man writes in 1670–71:

[47] In the above section 'Some Platonist Doctrines'. See Riley (1996) for an important discussion of Leibniz's views about justice and law and the role of Platonism in that side of his thought.

[48] For more on these problems in the development of Leibniz's thought, see Mercer (2001), esp. chapters 7–10. Among other things, I argue that such problems motivated Leibniz to develop his metaphysics of pre-established harmony.

[49] For the very first time, in 1668–69, Leibniz presents some of the details of the general relation between God and creatures. He explains: 'Ipse Plato in Timeo animam mundi, Aristoteles in Metaphysicis et Physicis Intellectum agentem per omnia diffusum, Stoici Substantiam Mundi Deum statuentes, Averroes Aristotelis Intellectum . . . propagans, Fracastorius et Fernelius Originem Formarum . . . in hoc consentiunt omnes: Substantiam, naturam, principium'. The text contains illegible parts, which have been marked with dots by the editors. See Leibniz, Akademie, VI, i, 511.

[50] Leibniz, Akademie, VI, i, 91.

[51] Leibniz, Akademie, VI, ii, 287–8. See also VI, ii, 490; VI, i, 285–6, 495–6; II, i, 97, 113.

[52] For a fuller discussion of the importance of plenitude and related matters to his philosophical development, see Mercer (2001), esp. chapters 3–6.

[53] Leibniz, Akademie, VI, i, 490.

[54] Leibniz, Akademie, II, i, 116.

But as a double reflection can occur in vision, once in the lens of the eye and once in the lens of a tube, the latter magnifying the former, so there is a double reflection in thinking: for since every mind is like a mirror, there will be one mirror in our mind, another in other minds. Thus, if there are many mirrors, that is, many minds recognizing our goods, there will be a greater light, the mirrors blending the light not only in the [individual] eye but also among each other. The gathered splendor produces glory.[55]

Through a fascinating blend of modern scientific images (of lenses and magnification) and ancient ones (of shadows and light), Leibniz radically increases the enhancement relation among minds: each mind mirrors all the others and thereby perceives all the other emanations of God. There is a cosmic unity among minds such that each reflects and enhances all the others.

But a question arises at this point. For the young Leibniz, every created thing is a mind-like substance that both instantiates and emanates the divine essence. The question is: exactly how does each substance differ from the others? To oversimplify somewhat, the answer for Leibniz is that each substance contains the same divine essence, though each does so in a *distinct* way: each mind-like substance reflects all the other substances, but does so from its own perspective. Each substance is a different perspective on the same thing.[56]

In 1672 Leibniz went to Paris, where he would spend four years. Most of his energies during the time were devoted to mathematics (he invented the calculus in the years 1672–75), but in the period 1675–76 he once again turned to the metaphysical ideas of his pre-Paris years. In a series of notes, entitled *De Summa Rerum*, he begins to use the term *expressio* as a means of describing the emanative relation between God and created things.[57] He explains that any product 'of God involves his whole essence'. When the attributes of God are 'related to one another, modifications result; hence it comes about that the same essence of God is expressed' in an infinity of ways.[58] But Leibniz is also explicit about the way in which creatures differ from God and from one another. He writes:

[55] 'Sed quemadmodum duplex in visu refractio contingere potest, altera in lente oculi, altera in lente tubi, quarum haec illam auget, ita duplex in cogitando reflexio est, cum enim omnis mens habeat speculi instar, alterum erit in mente nostra, alterum in aliena, et si plura sint specula, id est plures mentes bonorum nostrorum agnitrices, major lux erit, miscentibus speculis non tantum in oculo lucem, sed et inter se, splendor collectus gloriam facit'. Leibniz, Akademie VI, i, 464.

[56] See, e.g., Leibniz, Akademie VI, i, 477, 479, 484, 499.

[57] The notes of *De summa rerum* have gone unpublished until fairly recently. For the entirety of these papers, see Akademie VI, iii. For a subset of them in the original Latin with English translation, see Parkinson (1992).

[58] The relevant Latin text is: 'Attributa Dei infinita, sed eorum nullum essentiam Dei involvit totam; nam essentia Dei in eo consistit, ut sit subjectum omnium attributorum compatibilium. Quaelibet vero proprietas sive affectio Dei totam eius essentiam involvit . . . Ad quodlibet attributum dum alia referuntur omnia, resultant in eo modificationes, unde fit ut eadem Essentia Dei in quolibet Mundi genere expressa sit tota adeoque Deus infinitis se manifestet modis.' Akademie VI, iii, 514 (= Parkinson (1992), 69–71). Also see VI, iii, 522 (= Parkinson (1992), 83).

It seems to me that the origin of things from God is of the same kind as the origin of properties from an essence; just as 6 = 1+1+1+1+1+1, therefore 6 = 3+3, = 3 x 2, = 4+2, etc. Nor may one doubt that the one expression differs from the other . . . So just as these properties differ from each other and from essence, so do things differ from each other and from God.[59]

Each created substance is an expression of God's essence, and in this sense each has the same essence. But each nonetheless differs from every other because it is a *different* product or expression of that essence. God creates each substance so that it will express the divine essence in its own way. In fact, God chooses among an infinity of possible worlds, chooses the best, and then emanates that version of the divine essence to each and every creature. Despite the fact that each creature contains the same essence, each differs from every other in the adequacy of its instantiation. In a related text, he writes:

There is the same variety in any kind of world, and this is nothing other than the same essence related in various ways, as if you were to look at the same town from various places; or, if you relate the essence of the number 6 to the number 3, it will be 3 x 2 or 3 + 2 [sic], but if you relate it to the number 4 it will be 6/4 = 3/2, or 6 + 4 x 3/2. So it is not surprising that the things produced are in a certain way different.[60]

As a young man, Leibniz endorses the explanatory model of the mechanist, but cannot condone the foundations of that physics. He turns to Platonist ideas as a source for inspiration, and creates a more secure metaphysical basis for the new physics. He begins to develop his ideas in the period 1668–71, and adds important details in 1676. The Platonist doctrines articulated above (in the section 'Some Platonist Doctrines') are his building blocks.

The mature Leibniz

In the *Discours de metaphysique* of 1686 we find the same Platonist doctrines of the early works, though more clearly laid out: 'God himself is the greatest and wisest of all minds',[61] and the emanative source of creatures. He explains: 'It is very evident that created substances depend upon God, who preserves them and who even produces them continually by a kind of emanation, just as we produce our thoughts'.[62] Concerning the relation between God and creatures: 'For one sees clearly that all other

[59] 'Mihi videtur origo rerum ex Deo talis esse, qualis origo proprietatum ex essentia, ut senarius est 1+1+1+1+1+1. Ergo 6 =3+3, = 4x2, = 2=4, etc. Nec dubitandum est unam expressionem ab alia differre, nam uno modo ternarium expresse cogitamus, aut binarium, alio non idem . . . Ut ergo differunt hae proprietates, inter se et ab essentia, ita et differun res inter se et a Deo.' Akademie VI, iii, 518f (= Parkinson (1992), 77). A property here is a product or expression of the essence.

[60] 'Varietas eadem in quolibet genere mundi, nec est quicquam aliud, quam eadem essentia diversimode relata, ut se urbem eandem ex diversis locis aspicias, aut si essntiam senarii referas ad ternarium, erit 3x2 vel 3+2 [*sic*], sin ad quaternarium erit 6/4=3/2 or 6=4x3/2. Unde mirum non est, produc*i quodammodo diversa*.' Akademie, VI, iii, 523 (= Parkinson (1992), 83).

[61] *Discours de metaphysique*, §35: 'Et comme Dieu luy même est le plus grand et le plus sage des Esprits.'

[62] *Discours de metaphysique*, §14: '[I]l est premierement tres manifeste que les substances creées dependent de Dieu, qui les conserve, et même qui les produit continuellement par une maniere d'emanation, comme nous produisons nous pensées.'

substances depend on God in the same way as thoughts emanate from our substance, that God is all in all, and that he is intimately united with all creatures'.[63]

Not only is every substance an emanation of God, each is a constantly acting substance that expresses and reflects everything else. In a striking use of the Platonist image of the sun, Leibniz explains:

> Now, in rigorous metaphysical truth, there is no external cause acting on us except God alone, and he alone communicates himself to us immediately in virtue of our continual dependence. From this it follows that there is no other external object that touches our soul and immediately excites our perception. Thus we have ideas of everything in our soul by virtue of God's continual action on us, that is to say, because every effect expresses its cause, and thus the essence of our soul is a certain expression, imitation or image of the divine essence, thought, and will, and of all the ideas comprised in it. It can then be said that God is our immediate external object and that we see all things by him . . . God is the sun and the light of souls, the light that lights every man that comes into this world, and this is not an opinion new to our times.[64]

God emanates all the divine Ideas to individual souls, which express the essence of God and bear an enhancement relation to each other. Expanding on the enhancement relation of his earlier years,[65] Leibniz now claims that every creature expresses God and all the others, each with its own degree of clarity:

> . . . each singular substance expresses the whole universe in its own way . . . Moreover, every substance is like a complete world and like a mirror of God or of the whole universe, which each one expresses in its own way, somewhat as the same city is variously represented depending upon the different positions from which it is viewed.[66]

As Leibniz summarizes the point in *Primae Veritates*, an essay of 1689:

> *Every individual substance contains in its perfect notion the entire universe* and everything that exists in it, past, present, and future . . . Indeed, *all created substances are different expressions of the same universe* and different expressions of the same universal cause, namely, God. But the expressions vary in

[63] *Discours de metaphysique*, §32: 'Car on voit fort clairement que toutes les autres substances dependent de Dieu comme les pensées emanent de nostre substance; que Dieu est tout en tous, et comment il est uni intimement à toutes les creatures.'

[64] *Discours de metaphysique*, §28: 'Or dans la rigeur de la verité Metaphysique, il n'y a point de cause externe qui agisse sur nous, excepté Dieu seul, et luy seul communique avec nous immediatement en vertu de nostre dependence continuelle. D'où il s'ensuit qu'il n'y a point d'autre objet externe, qui touche nostre ame, et qui excite immediatement nostre perception. Aussi n'avons nous dans nostre ame les idées de toutes choses, qu'en vertu de l'action continuelle de Dieu sur nous, c'est à dire parce que tout effect exprime sa cause, et qu'ainsi l'essence de nostre ame est une certaine expression, imitation ou image de l'essence, pensée et volonté divine, et de toutes les idées qui y sont comprises. On peut donc dire, que Dieu seul est nostre objet immediat hors de nous, et que nous voyons toutes choses par luy . . . Dieu est le soleil et la lumiere des ames, *lumen illuminans omnem hominem venientem in hunc mundum*. Et ce n'est pas d'aujourdhuy qu'on est dans ce sentiment.'

[65] For a helpful paper on Leibniz's views about the mind/soul as mirror of God, see Leinkauf (2002).

[66] *Discours de metaphysique*, §9: 'Que chaque substance singuliere exprime tout l'univers à sa maniere . . . De plus toute substance est comme un mnde entier et comme un miroir de Dieu ou bien de tout l'univers, qu'elle exptrime chacune à sa façon, à peu pres comme une même ville est diversement representée selon les differentes situations de celuy qui la regarde.'

perfection, just as different representations or drawings of the same town from different points of view do.[67]

Like Ficino, Leibniz makes individual souls (mind-like substances) conduits for the power and self-sufficiency of God. Like many of his Platonist predecessors, the natural world is solidly rooted in the self-sufficiency of individual substances, whose divinely arranged interconnections form an intricate cosmic unity. Leibniz has solved the problems of passivity and plenitude with finesse: nature is constituted of an infinity of self-sufficient substances, each distinctively expressing the entirety of the perfectly harmonized world. As it turns out, Leibniz's famous doctrine of pre-established harmony results from this creative rendering of emanation, hierarchy, cosmic unity, and enhancement.

Anne Finch Conway (1631–1679)

The philosophy of Anne Conway is neither as well known nor as thoroughly articulated as that of Leibniz.[68] But it represents a brilliant use of Platonism to support the mechanical explanatory model. Like Leibniz, she employs a conciliatory method and combines the Platonist doctrines articulated above with the 'new' philosophy. Like Leibniz, she is concerned to solve the passivity and plenitude problems.[69]

The title of Conway's book, written in the 1670s, makes her goals clear: *The Principles of the Most Ancient and Modern Philosophy concerning God, Christ, and Creation, that is, concerning the Nature of Spirit and Matter, thanks to which all the Problems can be resolved which could not be resolved by Scholastic Philosophy nor by the Modern Philosophy in general, whether Cartesian, Hobbesian, or Spinozian*. She admits 'the remarkable and ingenious things concerning the mechanical aspects of natural processes' which are proposed by these philosophers (Ch. 9, §1), but she is keen to correct what she calls their 'false philosophy'. Fundamentally, this falseness derives from their misunderstandings about the role of the 'incorporeals' and 'spirits' of nature.[70] That is, like Leibniz, Conway is prepared to turn to the mechanical explanatory model to explain the phenomena of nature, but she is not prepared to ground this model as they do. According to Conway, the mechanical explanations are a great improvement over scholastic explanations, but based on utterly 'false principles'. The mechanical philosophers have created a 'weak foundation' so that 'dangerous errors have arisen'

[67] '*Imo omnes substantiae singulares creatae sunt diversai expressiones ejusdem universi,* ejusdemque causae universalis, nempe Dei; sed variant perfectione expressionis ut ejusdem oppidi diversae repraesentationes vel scenographiae ex diversis punctis visus' (emphasis in text), Akademie, VI, iv [B], 1646.

[68] For an important new study of Conway's life and work and for citations to the few articles that have been written on her thought, see Hutton (2004).

[69] Conway's immediate predecessors were also bothered by these issues. See Hüttemann (2001a).

[70] Conway composed her work in English, but the manuscript was lost after Henry More translated it and published it in Latin. There is little reason, therefore, to fuss about the Latin terms and phraseology found in the *Principles*.

(Ch. 9, §1). What concerns her most is their notion of 'dead matter'. Implicit in Conway's criticism of the concept of matter on which the mechanical philosophy depends is the fact that such dead matter can contribute nothing positive to the world. For Conway, brute passive stuff is inconsistent with the goodness and nature of God. Rather, the world is full of vitality, which exists as more or less spiritual. She writes: 'Every body can change into a spirit and every spirit into a body because the distinction between body and spirit is only of mode [of vitality], not essence'. For Conway, every thing in nature is a mode of vitality, and nature is infinitely full of such modes.

Conway employs the Platonist doctrines articulated above with brilliant finesse. God, who is the supremely good source of everything, emanates the divine perfections to the world. Conway begins her work writing:

> God is spirit, light, and life, infinitely wise . . . the creator and maker of all things visible and invisible . . . He is also in a true and real sense an essence or substance distinct from his creatures, although not divided or separate from them but present in everything most closely and intimately in the highest degree. Nevertheless, they are not parts of him or changeable into him, just as he is not changeable into them. (Ch. 1, §1)

Fundamentally, God gives to creatures 'form and figure but also essence, life, body, and whatever good they have' (Ch. 1, §3).

Like Leibniz, Conway intends to fill the world with activity. And like him, she thinks that the fundamental activity of all creatures follows from the fact that God emanates the divine attributes to creatures. She writes: 'In God there is an idea which is his image or the word existing within himself, which in substance or essence is one and the same with him . . . and indeed, all creatures were made or created according to this very idea or word'. Thus, 'the same being gives essence to all things.' God 'brings into being that which was hidden in the idea, so that He produces and makes a distinct and essential substance.' This substance is the vitality of the created world (Ch. 1, §1–7). The individual things of the natural world are different modes of the same underlying vitality that God shares with the natural world: 'so likewise all creatures, or the whole of creation, are also a single species in substance or essence, although it includes many individuals gathered into subordinate species and distinguished from each other modally but not substantially or essentially' (Ch. 6 §4).

The world is not just active, it is infinitely complex and its parts are perfectly related in their activity. According to Conway, God instantiates the Logos (or plan) in the world so that each part contributes to the goodness of the whole. Consistent with the enhancement relation, each benefits morally from all the others. Putting to neat use Platonists notions about the supreme being, emanation, and hierarchy, she explains: 'God is immediately present in all thing and immediately fills all things. In fact, He works immediately in everything in his own way'. Indeed, God shares all his attributes with creatures, other than mutability, 'because otherwise they would be God himself' (Ch. 5 §3).

Conway solves the passivity and plenitude problems quite simply. There is no problem because there is neither passivity nor sameness in the world. Everything is alive, but everything individual thing is a *different* mode of the underlying vital stuff. There is a hierarchy of vitality, so that even rocks, for example, have their own form. Moreover, every part reflects and relates to all the others: 'For God gave existence, life and motion to everything and He loves everything accordingly' (ch. 7 §3). Like Leibniz, the world is infinitely full of vital parts, each of which is infinitely complex, and so on *in infinitum*: 'The nature of creatures is to be infinitely complex and naturally active . . . Nor can creatures be annihilated.' For Conway, all creatures move toward the good, though some more slowly than others: 'Therefore, there is the same justice in all things, so that even in their transmutations—sometimes by ascending, sometimes by descending—so that the same justice appears' (Ch. 6 §7).

Conclusion

Leibniz, Conway, and many other philosophers working in the second half of the seventeenth century intended to replace the scholastic explanatory model with the mechanical one. They agreed that some form of extension and motion should replace the innate powers of substantial forms as the best means to explain the particular phenomena of nature. But despite their endorsement of the new physics, these second-wave mechanists could not condone the metaphysical assumptions of the first-wave philosophers. They demanded that their natural philosophy be consistent with the goodness, plenitude, and power of the divinity; and they set about making the explanatory model of the mechanists consistent with such a world. Many of second-wavers turned to the Platonist tradition for help. Leibniz and Conway are only two examples of the significant role of Platonism in early modern natural philosophy.

The success of the mechanical philosophy in the seventeenth century is enormously important, and the historical events leading to its dominance constitute a major part of the history of modern science. But the story of that success is both more complicated and more interesting than it has previous been taken to be. Platonism plays a bigger part in that story than has been traditionally understood.