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Roger Ariew

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Descartes and the Teaching of Philosophy in Seventeenth-Century France

Roger Ariew

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[-] Abstract and Keywords

The chapter discusses the institutional setting of early modern French education and the dominant players at the time, the secular colleges of the University of Paris and the colleges of the three principal teaching religious groups: the Jesuits, Oratorians, and Doctrinaires. It tries to provide the background to the teaching of philosophy in seventeenth-century France, including an introduction to these various teaching groups and a general characterization of the contents of their teachings. It uses these materials to discuss the social and intellectual relations between Descartes and two main teaching groups, the Jesuits and the Oratorians. Part of the background for these relations involves the official disapprobation or censure of Cartesian philosophy. Descartes' philosophy during the seventeenth century was subject to numerous condemnations by religious, political, and academic institutions, perhaps as many as those suffered by Aristotle's philosophy during the thirteenth century.

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Keywords: University of Paris, Jesuits, Oratorians, Doctrinaires, condemnations of Cartesian philosophy

The institutional setting of early modern French education was fairly complex; the dominant players at the time were the dozen or so secular Catholic colleges of the University of Paris, together with seculars in about a dozen major cities, and the colleges of the three principal teaching religious groups: the Jesuits, the Oratorians, and the Doctrinaires. There were others who taught philosophy, of course—a handful of Franciscans, Dominicans, Benedictines, Josephites, and the like, plus a few Protestants. But the largest set of colleges was clearly that of the Society of Jesus, which became a very powerful force in early modern French education. To give a snapshot of a changing situation, just before the Jesuits were expelled from France in 1773, they controlled 105 colleges, in contrast with those of the other main teaching groups: twenty-six by the Oratory and twenty-seven by the Doctrinaires.¹ This chapter tries to provide the background to the teaching of philosophy in seventeenth-century France, including an introduction to these various teaching groups and a general characterization of the contents of their teachings. It also attempts to use these materials to discuss the social and intellectual relations between Descartes and the two main teaching groups, the Jesuits and the Oratorians. Part of the background for these relations involves the official disapprobation or censure of Cartesian philosophy. Strangely, Descartes' philosophy during the seventeenth century was subject to numerous condemnations by religious, political, and academic institutions, perhaps as many as those suffered by Aristotle's philosophy during the thirteenth century.

In 1671, François de Harlay, the archbishop of Paris, announced a verbal decree from King Louis XIV requiring that "no other doctrine be taught in the universities than the one set forth by the rules and statutes of the university, and that nothing of these other doctrines be put into theses." The King thus prohibited "certain opinions the faculty of theology once censured, whose teaching or publication was prohibited by the Parlement," which, as he put it, "could bring some confusion in the explanation of our (**p.2**) mysteries."² The reference in the decree to "certain opinions the faculty of theology once censored" was an allusion to a condemnation of fourteen anti-Aristotelian propositions some fifty years earlier. In 1624, the Sorbonne had censored various opinions disseminated by some alchemists.³ The faculty had objected to such propositions as "the prime matter of the Peripatetics is utterly fictitious," and "their substantial forms are no less absurdly defended."⁴ Moreover, the faculty had also censored the proposition that "physical alterations happen through the introduction or destruction of an accidental entity," because, they said, it attacked the "holy sacrament of the Eucharist."⁵ Thus, the "confusion in the explanation of our mysteries" in the King's 1671 edict also alluded to the 1624 condemnation. The King's exhortation—"to bring it about that no other doctrine than the one set forth by the rules and statutes of the University is taught in the Universities"—recalled the subsequent *arret* issued by the Court du Parlement. That legal document prohibited "all persons, under pain of death, from either holding or teaching any maxims against the ancient authors which were approved by the doctors of the Faculty of Theology."⁶ As a result of King Louis' decree, various universities—Angers, Caen, Paris—followed with attempts to carry out his Majesty's

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wishes by dismissing professors who taught Descartes' philosophy. And, in fact, four Oratorian philosophy professors, including Bernard Lamy, were subsequently dismissed from their posts at Angers for teaching Cartesian philosophy. Although Louis did not mention Cartesianism explicitly, it was clearly the "other doctrine" against which the 1671 decree was directed. In any case, he clarified his intent by 1675, specifically naming those who "taught the opinions and thoughts of Descartes" as ones who "might bring disorder to our Kingdom." Louis ordered "they be prevented from continuing their lessons in any way whatsoever."⁷

The Cartesians' response was diverse and perhaps unexpected. It included a parody of Parlement's edict.⁸ In their "arret burlesque" the Cartesians mandated that Aristotle be reestablished "in the full and peaceful possession of the Schools" and commanded "that he always be taught and followed by the regents, masters, and professors of the Schools, without however, their being required to read him, or to know his opinions." They similarly ordered the heart to remain the principle of the nerves and the blood to stop circulating. They even reestablished the good reputation of the Scotist identities, virtualities, and other formalities. In fact, other than protecting Aristotle from (p.3) the examination of Reason, the Cartesians, in their burlesque, seemed most eager to prevent Reason from defaming and banishing from the Schools the "formalities, materialities, entities, identities, virtualities, haecceities, petreities, polycarpeties, and all the other children of the defunct Master of the Schools, John [Duns] Scotus, their father." If the court did not act, they suggested, this "would bring about a great prejudice and cause a complete subversion of the Scholastic philosophy which derives all its substance from them."⁹ The Cartesians did not just wage a battle against that ancient author Aristotle but directed their ire against the less ancient Scotus, the Master of the Schools, as well.

The edicts from the King, the Sorbonne, and Parlement, and the burlesque from the new philosophers, raise a host of historical issues: we can ask what these reveal about the relationship between philosophy in the faculty of arts and religious doctrine in the higher faculty of theology; or what these indicate regarding the limits to any potential changes in School philosophy in France; we can ask about censorship in general and Louis XIV's antipathy to Cartesianism in particular; we can wonder about the later Cartesians' grounds for accepting Cartesian philosophy; and about their view of School teaching as moribund: professors merely repeating Aristotle, whom they have not read and do not know. Here I wish to consider just a few of these issues regarding the teaching of philosophy in seventeenth-century France. Among these, one might find puzzling that the authority the Cartesians attack as Master of the Schools is John Duns Scotus, and not Thomas Aquinas. Assuming these satirists understood their Scholastic opponents, how did Scotus come to be, after Aristotle, the "Master of the Schools" in seventeenthcentury France? Do we not think that Thomas Aquinas held this lofty position then? Did not the Jesuits dominate education during the early modern period, especially during the time of Louis XIV? And was not the Society of Jesus notorious for having a penchant for Thomist philosophy and theology?

Scholars have, indeed, told us such things; according to them, the Jesuits, notorious

Thomists, dominated French education in the early modern era; and the Jesuits were not the only Thomists teaching in seventeenth-century France. Even L. W. B. Brockliss titled a section of his usually sound and insightful book on French higher education "Thomist Aristotelianism and the New Science, 1600–1690." There he asserts, "The leading scholastic influence on the seventeenth century course was undoubtedly Aquinas. Virtually every professor claimed to be a Thomist with the understandable exception of Franciscans like Claude Frassen who pledged their allegiance to the rival school of Duns Scotus."¹⁰ To be fair, Brockliss continues by moderating his thesis; that is, by admitting that the Thomist view was rejected on some particular *quaestiones*, such as whether matter could have an existence separate from form, whether God could not create an infinite body, and whether motion was sustained through the **(p.4)** pressure of displaced air. Still, the judgment that Aquinas was the leading Scholastic authority in the seventeenth century is well entrenched.

1.1. Seventeenth-Century Scholastic Philosophy: Thomism and Scotism As we know, there was a renaissance in Thomist philosophy during the second half of the sixteenth century.¹¹ In 1567 Pope Pius V proclaimed St Thomas Doctor of the Church and commissioned a master edition of his works (accomplished in Rome, 1570-1). And, as I have said, the Jesuits played a significant role in collegiate education at the time. It is easy to show that the Jesuits officially leaned toward Thomism; in practice, however, they mixed their Thomism with other kinds of Scholastic thought, Scotism in particular. The first part of this claim is well known, so I will limit myself to sketching it with a few broad strokes, paying slightly closer attention to the second half of the claim. In the Constitutions of the Society of Jesus, Ignatius of Loyola, founder of the Society, recommended Jesuits to follow the doctrines of St Thomas in theology and those of Aristotle in logic, natural philosophy, ethics, and metaphysics.¹² What this actually entailed is more difficult to determine. After Loyola, the official position of the Society was further specified. Francisco Borgia, third General of the Jesuits (1564–72), advised: "Let no one defend or teach anything opposed, detracting, or unfavorable to the faith, in either philosophy or theology. Let no one defend anything against the axioms received by the philosophers.... Let no one defend anything against the most common opinions of the philosophers and theologians."¹³ Borgia even formulated various opinions that Jesuits must sustain, teach, and hold as true, including several propositions concerning man:

The intellective soul is truly the substantial form of the body, according to Aristotle and the true philosophy. The intellective soul is not numerically one in all men, but there is a distinct and proper soul in each man, according to Aristotle and the true philosophy. The intellective soul is immortal, according to Aristotle and the true philosophy. There are not several souls in man, intellective, sensitive, and vegetative souls, and neither are there two kinds of souls in animals, sensitive and vegetative souls, according to Aristotle and the true philosophy.¹⁴

In that litany, "Aristotle and the true philosophy" clearly meant Thomism. In fact, it can be easily shown that to hold the opinion, stipulated by Borgia, that there are not several souls in man is to deny a Franciscan doctrine (Scotist or Ockhamist) on behalf of a Thomist

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one. It is clear that the stipulation, in the Constitutions of the Society **(p.5)** of Jesus, to follow Aristotle in philosophy and St Thomas in theology resulted in a requirement to teach Thomist philosophy.

Not all Jesuits agreed that it was a good thing for the Society to choose a single authority or that St Thomas was always the best author to uphold. With the succession of Claudio Aquaviva as the fifth General of the Society (1581-1615), these issues took on a new vigor. The period was the one in which the Society reorganized its curriculum. Jesuits undertook extraordinary pedagogical discussions, ultimately leading to the Ratio Studiorum, the approved curriculum for all Jesuit colleges. In the meanwhile, Aquaviva summarized the points that had to be observed. These included an admission that "no doubt we do not judge that, in the teaching of Scholastic theology we must prohibit the opinion of other authors when they are more probable and more commonly received than those of Saint Thomas."¹⁵ However, he continued, "Yet because his authority, his doctrine, is so sure and most generally approved, the recommendations of our Constitutions require us to follow him *ordinarily*. That is why all his opinions whatever they may be ... can be defended and should not be abandoned except after lengthy examination and for serious reasons." Aquaviva said: "the primary goal in teaching should be to strengthen the faith and to develop piety. Therefore, no one shall teach anything not in conformity with the Church and received traditions, or that can diminish the vigor of the faith or the ardor of a solid piety."¹⁶ And he reiterated the same points as Borgia, extending them to philosophy:

Let us try, even when there is nothing to fear for faith and piety, to avoid having anyone suspect us of wanting to create something new or teaching a new doctrine. Therefore no one shall defend any opinion that goes against the axioms received in philosophy or in theology, or against that which the majority of competent men would judge is the common sentiment of the theological Schools. ... Let no one adopt new opinions in the questions already treated by other authors; similarly, let no one introduce new questions in the matters related in some way to religion or having some importance, without first consulting the Prefect of studies or the Superior.¹⁷

Although clearly not set in stone, the requirement to follow Thomas seems to have been reiterated officially; the Jesuits appear to have deserved their reputation for being eager Thomists, though allowing for some disputes within the order. But still, how long did the Jesuits follow Thomas in philosophy in practice, if they ever did?

The answer to such questions may be obscured by there being no necessary or sufficient conditions for such categories as Thomism—or Scotism—or even Aristotelianism (or even Cartesianism, as we have said in the Introduction). Clearly there were many issues, both major and minor, on which Scotus disagreed with Thomas, ranging through the philosophical corpus. Many philosophers took up these issues, continuing the debate. In the seventeenth century some authors did write books detailing the "great systems of philosophy," Thomism and Scotism—or **(p.6)** Thomism, Scotism, and Nominalism; at times Averroism was added into the mix. Moreover, others tried to reconcile Thomism

and Scotism or to settle accounts between the two.¹⁸ Still others wrote books following Thomas or following Scotus. For example, Claude Frassen, the Parisian Franciscan mentioned by Brockliss, wrote two such multi-volume works, *Philosophia Academica*, *quam ex selectissimis Aristotelis et Doctoris Subtilis Scoti rationibus* (1668) and *Scotus* Academicus (1672–7), while the French Dominican, Antoine Goudin, wrote Philosophia juxta inconcussa tutissimaque Divi Thomae dogmata (1668). Thus, the categories Scotist and Thomist are not historians' constructions, but come from the early modern writers themselves. However, as important as these self-identifications were, the bulk of philosophical teaching in France did not openly align itself with any particular philosopher. Textbooks were simply called something like Summa philosophiae quadripartita or Universae philosophiae; they made few general claims to be following any philosopher (other than Aristotle).¹⁹ Thus, lacking sufficient actors calling themselves Thomist or Scotist, we have to delve deeper to find a commitment to any specific philosophical system. Setting aside Brockliss' claim that "virtually every professor claimed to be a Thomist," we should investigate his contention that some Thomist views were rejected in particular quaestiones. We might then be able to determine whether there are any legitimate generalizations to be made about the contents of these quaestiones.

Making sense of Scotus as the "Master of the Schools" would therefore require us to analyze these specific oppositions between Scotists and Thomists in seventeenth-century France and to ask how the various teaching groups at the time might have lined up with respect to these debated topics. My approach here is to determine most generally what Thomism is by reference to some recognizable Thomist theses (that were said to be Thomist at the time) and then to define Scotism in opposition to a few of these Thomist theses. I will try to determine whether what was taught by the principal teaching groups in seventeenth-century France can more properly be called "Thomist" or "Scotist." These are obviously broad strokes that might conceal significant differences among philosophers. In subsequent chapters, I will look more closely at various seventeenthcentury Scholastic writings on logic, ethics, physics, and metaphysics. But meanwhile, let us see whether we can determine in a general way what is a Thomist and what, in contrast to this, is a Scotist.

Most useful for these purposes is the previously mentioned seventeenth-century textbook, *Philosophy in Accordance with the Principles of Saint Thomas*,²⁰ of the Dominican Antoine Goudin. In the work, Goudin is concerned with defending the (**p.7**) philosophy of Aquinas and with refuting the criticism leveled at it by Duns Scotus. Goudin's philosophy textbook was reprinted numerous times in the seventeenth and eighteenth centuries; there was a scholarly Latin edition and even a French translation of it in the nineteenth century. The Latin edition and French translation suggest that the work had considerable influence on late nineteenth- and early twentieth-century Neo-Thomism.²¹ The later Catholic Church, under the leadership of Pope Leo XIII (with his 1878 encyclical *Aeterni Patris*) and thereafter, promoted what it called "Thomism." In 1914, with the approval of Leo's successor Pius X, the Sacred Congregation of Studies attempted to define Thomism through twenty-four theses they thought embodied its essentials.²² I detail Goudin's Thomism and his arguments against Scotism following the

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order of these twenty-four theses.

The first six of the theses characterize Thomistic metaphysics. All beings are composed of potential and actual principles, except God, who is pure act, utterly simple, and unlimited. He alone exists independently; other beings are composite and limited. Being is not predicated *univocally* of God and creatures, and divine being is understood by *analogy*. There is a real distinction between essence and existence and between substance and accidents. We encounter here an important Thomist thesis, with many ramifications, that what we say about God is only by analogy to what we say about creatures. The doctrine complements well Thomas' "anti-Platonist" view that we do not have direct access to God's ideas or eternal exemplars in this life (as the souls of the blessed do) and that we do not have knowledge of God's essence. This set of theses is discussed in the first three quaestiones of Goudin's Metaphysica. In guaest. 1, art. 2, Goudin calls act and potency the two chief constitutive principles of being.²³ He then argues at length in guaest. 2, art. 2 that being is not said of God and creatures univocally, but analogically,²⁴ and that being is not univocal with respect to substance and accident.²⁵ One of the objections handled by Goudin in this article involves the knowledge of God and his attributes; he affirms, in good Thomist fashion, that we have only limited knowledge of God: "the knowledge we have of God is certain, but it does not penetrate perfectly to divine being nor to the manner this being is suitable for God; what we know is not much better than negation, insofar as we recognize in God a manner of being much more sublime than that of creatures."²⁶ Scotus is the target of all of these arguments: "Let us first say that almost all philosophers admit that there is no univocity between a *being* of reason and a real being, given that the former is only fictive and assumed. The only difficulty is with respect to God and creatures, substances and accidents. Scotus claims that being is univocal among all of these."²⁷ Scotus is also the target in Goudin's third article, about the distinction (p.8) between essence and existence: "The only question is whether essence and existence are really distinct. Most philosophers deny it; Saint Thomas affirms it wisely. Scotus holds that the distinction arises from the difference between the form and the nature of the thing."²⁸ Implied in this set of theses is a theory of distinctions in which there can be only two kinds of distinctions: real and of reason. Goudin's discussion also continues in this manner: quaest. 3, art. 2 concerns various kinds of distinctions. Goudin pits Scotus' view that there is a formal distinction, operating before the operation of the intellect, and holding according to the nature of the thing, against "Saint Thomas' opinion, held universally" that in such cases "there is only one and the same entity conceived diversely."²⁹ The first six theses seem to represent Thomist metaphysics, as it would be understood generally during the seventeenth century, and hold a number of oppositions between Thomas and Scotus, as perceived in the seventeenth century.

The seventh Thomist thesis asserts that spiritual creatures are composed of essence and existence and substance and accident, but not matter and form. This is a transitional thesis about intelligences such as angels that was also disputed, along with their individuation, manner of cognition, volition, and their ability to effect changes in creatures. Goudin discusses some of these issues, but does not specifically contrast the Thomist position against the Scotist one.³⁰

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Theses eight to fourteen treat corporeal beings. These are composite; that is, constituted of matter and form, meaning potency and act, neither of which may exist per se-Goudin argues that what is changed cannot be absolutely simple but must necessarily be composed of potency and act.³¹ Bodies are extended in space and subject to quantification; quantified (or *signate*) matter is the principle of individuation. Bodies can be in only one place at a time. There are animate and vegetative souls, which are destroyed at the dissolution of the composite entity. It happens that all of these theses were in some way controversial, directly or indirectly, in the debates between Thomists and Scotists, as they were understood during the seventeenth century. In particular, matter as potency and prime matter as pure potency that cannot subsist apart from form, signate matter as the principle of individuation, and the impossibility of two bodies being in the same place or one body being in two places at one time, became the object of intense debate. Goudin, of course, reflects these discussions. He argues that prime matter is pure potency and thus has no existence of itself, against the view that matter and form each have their own proper and partial existence. He relates the latter to the Scotist thesis that existence is not to be distinguished from essence in reality, something he claims to refute in his *Metaphysica*.³² He tackles the implication of the Thomist doctrine head on. In his *Physica* he asks "whether God could create matter without form by his omnipotence." He replies: "Scotus affirms this, as do some authors outside the school of Saint Thomas; (p.9) Saint Thomas and all Thomists deny it";³³ and he proceeds to defend the Thomist denial. In his Metaphysica Goudin also defends the Thomist view about the numerical unity and multiplicity of substances: "they arise from matter that connotes quantity. Thus think all Thomists against Scotus."³⁴ And he rejects Scotus' *haecceity* as the principle of individuation.³⁵ Moreover, he devotes a lengthy discussion to the topic of "whether the same body can be in several places by way of extension or circumscription, denied by Saint Thomas, Saint Bonaventure, and others, against Scotus."³⁶ This set of theses also seems to represent adequately the metaphysical foundations of Thomist physics as it is distinguished from Scotist thought.

Theses fifteen to twenty-one deal with humans more specifically. Human souls are capable of existing apart from their bodies, are created by God, are without parts and so cannot be disintegrated naturally (that is, they are immortal). They are the immediate source of life, existence, and perfection in human bodies, and are so united to the body as to be its single substantial form. The Thomist theses continue by distinguishing the two faculties of the human soul, cognition and volition, from each other, and sensitive knowledge from intellection. They assert that the proper object of the human intellect, in its state of union with a body, is restricted to "quiddities" (or essences) abstracted from material conditions.³⁷ For Thomists, volitions are said to be free. It is notable that Goudin finds grounds to dispute with the Scotists even with respect to such seemingly unimportant guestions as whether the intellect is nobler than the will.³⁸ This set of theses might look innocuous, but it contains the disputed principle (referred to by Borgia) of the unity of the human soul, which, it is argued, cannot be composed of a plurality of forms, rational, sensitive, and vegetative, as well as the "empiricist" thesis that the proper object of the human intellect is what is abstracted from material conditions. Goudin reflects these debates as well. He rejects the Scotist opinion about the form of corporeity subsisting

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after death for the Thomist view that in substantial corruption there is resolution to matter deprived of all forms: when a person dies and the rational soul departs, all human accidents perish at the same time and are replaced by similar accidents.³⁹ Goudin then details a debate between Scotists and Thomists about how qualities are intensified, taking the Thomist side, as usual.⁴⁰ And he devotes a whole article against the Ockhamist view of the plurality of forms and the Scotist view on the *form of corporeity*.⁴¹ On the question about the object of the intellect, Goudin is fairly (**p.10**) clear: in his *Physics* he states: "the object of the human intellect in its state of life is the quiddity of material or sensible things and what can be deduced out of them. That is the doctrine of Saint Thomas";⁴² however, in his *Metaphysics* he further specifies: "the material object of the intellect is real being, created and uncreated, substance and accident, but the formal object of the intellect is the common notion of being abstracted all from matter."⁴³

Finally, Thomist theses twenty-two to twenty-four concern knowledge of God. Divine existence is neither intuited nor demonstrable a priori, but it is capable of demonstration a posteriori. The simplicity of God entails the identity between his essence and his existence. God is creator and first cause of all things in the universe. Goudin comments on Thomas' five a posteriori demonstrations for the existence of God and defends them against various objections,⁴⁴ including Scotus' objection to the first argument that the power that moves a thing can be located in what is moved.⁴⁵ The Thomist claim that God is not demonstrable a priori is a consequence of the opinion that God's essence cannot be grasped in this life. "Platonists" such as Augustine and Anselm held that the existence of God could be demonstrated a priori.

Even at this most abstract level, as we have already seen through Goudin's attacks of Scotism in his defense of Thomism, we can make sense of Scotism in opposition to the Thomist theses. Unlike the Thomists, Scotists held that the proper object of the human intellect is being in general⁴⁶ and not merely the "quiddity" of material being.⁴⁷ Scotists would have thought that the concept of being held univocally (not analogically) between God and creatures;⁴⁸ that there is only a formal or modal (not real) distinction between essence and existence and between substance and accidents;⁴⁹ that prime matter can subsist independently of form at least by God's omnipotence;⁵⁰ that a *haecceity*, or individual form (not signate matter) is the principle of individuation for bodily creatures;⁵¹ that a body can be in two places at the same time;⁵² and that humans are a composite of plural forms: rational, sensitive, and vegetative.⁵³ The Scotist theory of formal or modal distinction and the claim that the principle of individuation is an individual form or *haecceity* were, of course, the basis for the Cartesians' burlesque of Scotist "formalities, materialities, identities, haecceities, etc."⁵⁴

(p.11) Thus we have some clearly defined positions by which we can judge whether a School philosophy that does not openly declare itself as following any particular author might be considered as leaning toward Thomism or Scotism. But before applying this rough instrument, we should mention briefly the general course of studies of the main groups teaching philosophy during the seventeenth century. As diverse as these groups were, the place of philosophy in the French curriculum, whether taught by seculars or

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regulars, was fairly similar. Students took four or five years of humanities (French, Latin, and Greek language and literature) followed by a year of rhetoric and the collegiate curriculum—that is, two years of philosophy. The latter was an Aristotelian-based quadripartite program of logic, ethics, physics, and metaphysics, often taught in that order. Jesuits added a third year and also taught a course in mathematics; ethics was sometimes paired up with metaphysics. At least one Oratorian College apparently taught logic and metaphysics the first year and ethics and physics the second.⁵⁵ In spite of these differences, the reason to emphasize the similarity of the curriculum is that it yielded a similarity of textbooks. One can find quadripartite philosophy texts written by a wide variety of French teachers of philosophy, seculars from the University of Paris or Jesuits, Oratorians, Doctrinaires, Franciscans, Dominicans, etc.

The Colleges of the University of Paris

From an examination of their publications it would be easy to show that Parisian secular masters in the first half of the seventeenth century accepted the Scotist view on most of our disputed theses. Take, for example, Eustachius of Sancto Paulo (1573–1640), who received a Doctorate of Theology from the Sorbonne in 1604 and entered the Cistercian congregation of the Feuillants in Paris, 1605, maintaining close relations with the Sorbonne throughout his life. Eustachius wrote possibly the best-selling Latin-language philosophy textbook of the seventeenth century, *Summa philosophiae quadripartita*, published in 1609, with editions almost yearly until 1649. Eustachius' work was even used at Cambridge in the 1650s, its ethics section becoming part of the curriculum there until the early eighteenth century. But what one can say about Eustachius could, on the whole, be repeated for other Parisian masters, such as Charles François d'Abra de Raconis,⁵⁶ and in the works of the teachers of the French nobility, such as Scipion Dupleix.⁵⁷

(p.12) Returning to the contents of philosophical teaching, on the question of whether the proper object of the human intellect, that which is studied by the science of metaphysics, is the "quiddity" of material being (with the intellect proceeding up the hierarchy of beings ultimately by analogy alone) or whether it is being in general, Eustachius sided with Scotus (for the most part). Without referring to any particular authority, he rejected the Thomist position that the object of metaphysics is predicated being, and accepted the Scotist one that the object of metaphysics is being, common to God and created things, as the standard view: "the standard view is far more plausible, namely that the complete object of metaphysics in itself ... is real being, complete and in itself, common to God and created things."⁵⁸ Eustachius also defended the proposition that God's essence cannot be conceived except as existing,⁵⁹ and he asserted that we can form concepts of God's essence in this life: "By means of the natural light we can even in this life have imperfect awareness of God, not merely of his existence but even of his essence."⁶⁰ Eustachius continued in a Thomist fashion, however, by denying that we can demonstrate God's existence a priori, since God is not *per se nota* to us;⁶¹ he also asserted that what is said about God and creatures is said analogically, not "synonymously."⁶²

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In contrast, Eustachius, like Scotus, and against Thomas, accepted a third distinction beyond real and rational; he argued that there are three kinds of distinctions: real, rational, and another he called a natura rei, which he further subdivided into formal, modal, and potential.⁶³ He also held that matter can exist independently of form: "Although matter cannot be produced nor annihilated by any natural agent, God can create or annihilate it. ... God can strip naked all forms, substantial and accidental, from matter, or create it naked, without form, ex nihilo, and allow it to subsist by its own power in such a state."⁶⁴ Moreover, he thought that humans are a composite of plural forms, not a single substantial form.⁶⁵ He also argued for the Scotist doctrine that a form, not signate matter, is the principle of individuation.⁶⁶ On the theory of place, Eustachius again sided with Scotus: external and internal place are relations between the containing and contained bodies, and two places are the same only by equivalence, not in relation to a fixed reference frame.⁶⁷ Moreover, after maintaining that two bodies can be in one place by divine virtue, Eustachius argued that there is no incompatibility (p.13) involved in one body existing in several places.⁶⁸ On the theory of time, Eustachius argued for what may have been the successor to the Scotist line: time is divisible into real time and imaginary time, where imaginary time is that which precedes the creation of the world.⁶⁹ (And of course, imaginary time would be independent of bodies and their motions.)

Oratorians and Doctrinaires

Similar things can be said about the Oratorians, whom it would not be unfair to characterize as within the sphere of influence of the University of Paris.⁷⁰ The Oratory officially began in 1613, when Pope Paul IV signed the bull *Sacro Sanctae*, sanctioning the institution, and Parlement registered the patent letters authorizing the society's foundation. It was initiated two years earlier by a group of six priests, led by Pierre de Bérulle, who gathered at a house on rue Saint-Jacques in front of the Carmelite convent in Paris, with the intent to live together as a community.⁷¹ Of the six, three were doctors and two bachelors of theology, all from the Sorbonne. By 1629, when Bérulle died,⁷² the Oratory maintained forty-four flourishing houses. It also had established more than a dozen colleges—even though it did not set education as a primary goal.⁷³ Bérulle hesitated to accept teaching as a function for Oratorian priests, in part because he did not wish to offend (or to compete with) the Jesuits.⁷⁴

As I have said, French education during the first half of the seventeenth century was fairly similar in form. Oratorians followed the general pattern.⁷⁵ They probably differed somewhat from the Jesuits and Doctrinaires by conducting their teaching primarily in French,⁷⁶ and they seem to have added courses in history and geography as **(p.14)** early as the 1640s. In philosophy, like everyone else, they taught a broadly Aristotelian set of courses (at least until the 1660s). Perhaps because of Bérulle's propensity for what he called "Platonic" thought,⁷⁷ the Aristotelianism of the Oratory differed slightly from that of the Jesuits and Doctrinaires. From the textbooks published by two early Oratorians, William Chalmers and Jacques Fournenc, Oratorian teaching seems to have been more eclectic. Chalmers (or Camerarius, 1596–1678), who became an Oratorian in 1627, taught at Angers and published works on logic and ethics,⁷⁸ "following the thoughts of the Subtle Doctor";⁷⁹ that is, John Duns Scotus. Fournenc (1609–69), who

became an Oratorian in 1623, taught at Marseille, Condom, and Angers (1641–8), and published a synopsis of Aristotle's doctrine "with various explanations and illustrations from the thoughts of Plato."⁸⁰ Fournenc's colleague at Angers, Jean-Baptiste Duhamel (1624–1706), was even more unusual. He entered the order in 1643 and, having taught at Angers from 1646 to 1652, he left the following year to become the curé of Neuilly-sur-Marne, near Paris. Duhamel is best known for his attempt to reconcile ancient and modern philosophy. His *Astronomia physica* and *De meteoris et fossilibus* (both published in 1660) are written as conversations among Theophilus, an advocate of ancient philosophy, Menander, a passionate Cartesian, and Simplicius—who is Duhamel's mouthpiece—a non-dogmatic philosopher who seizes upon what is best from each of his interlocutors. Duhamel's *De consensu veteris et novae philosophiae* (1663) and *Philosophia vetus et nova ad usum scholae accomodata* (1678) are also written in a similar vein.⁸¹

What I have asserted about the Parisian masters and the Oratorians, however, cannot be said of the Doctrinaires.⁸² While there are very few philosophy textbooks published by Doctrinaires in the seventeenth century, the little we have does support the claim that they taught Thomism exclusively. There are a number of examples to support this in Jean de Viguerie's book about the French and Italian Doctrinaires; a single example here should suffice to impart the flavor of such discussions. One of the *quaestiones* in Jean Vincent's *Cursus philosophicus* (Toulouse, 1660–71) is whether matter can exist by itself without form. Vincent divides the issue into two groups, the Scotists (including Henry of Ghent, Gregory of Rimini, Suárez, and others), who assert that matter has proper existence, and the Thomists (including Cajetan and Zabarella), who think matter to be without proper existence.⁸³ Vincent sides with the second (Thomist) view, affirming that matter does not have proper existence and answering negatively to **(p.15)** *both* the questions whether matter can exist without form either by God's power and whether it can exist without form naturally.⁸⁴

Jesuits

It seems fairly clear that, with few exceptions, early Iberian and Roman Jesuits, such as the Conimbricenses (the Jesuits of the University of Coimbra) and Franciscus Toletus, on the whole defended a Thomist physics. Their general allegiance to Thomist theory of matter and form, place and time, can easily be documented. For example, when Toletus discussed the question of whether prime matter is a substance, he detailed both Scotus' alleged affirmative reply and Thomas' negative answer—prime matter is pure potency—in order to side with Thomas. Toletus then discussed whether matter could exist without form. He referred to Thomas' thinking that that would be impossible, since it would imply a contradiction, and to Scotus' doctrine that it can be done by supernatural means. He concluded that he sided with Thomas, that there could not be any matter in act without a form. Against Scotus he argued that matter in itself is imperfect.⁸⁵ Similarly, Toletus agreed with Thomas on the question of the plurality of forms⁸⁶ and took his side against Scotus on the question of the immobility of place;⁸⁷ he also argued a Thomistic line that if there is no motion, there is no generation or time.⁸⁸ On the other hand, Toletus

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existence, quantified matter as the principle of individuation, and some aspects of the explanation of the Eucharist.⁸⁹

In contrast, later Jesuits rejected the Thomist position on these topics for the Scotist one. For example, the French Jesuit René de Ceriziers, writing in 1643,⁹⁰ argued that there can be no form without matter and no matter without form by natural means. But he added, "however, one must not deny that God can conserve matter without any form, since these are two beings that can be distinguished, which no more depend upon one another than accident upon substance, the former being separated from the latter in the Eucharist."⁹¹ Further, he affirmed that a body can be in two places at the same time by divine power⁹² and even that two bodies can similarly be in the same (p.16) place.⁹³ De Ceriziers also disputed the Aristotelian (and indirectly the Thomist) view about time: "Aristotle claims that time is the number of motion or of its parts, insofar as they succeed one another. Now it is certain that time is a work of our mind, since we construct a separated quantity from a continuous one, naming it the number of motion, that is, of the parts that we designate in it."⁹⁴ And he seems to have accepted the relativity of place.⁹⁵ In another clear departure from Thomism, de Ceriziers argued that God could produce an actual infinity: "Although we refuse Nature the power of producing the infinite, we should not refuse it to its Author. Can he not make everything he can in this moment-for example, can he not make all the men he can produce? If so, their multitude will either be finite or infinite. Let us say that it is finite; that would be to limit God's power. To grant that it is infinite is to agree with my opinion."⁹⁶ And de Ceriziers proceeded to reject all arguments claiming that an actually infinite world would be impossible.

While de Ceriziers' physics seems to have become Scotist, his metaphysics appears to have remained Thomist, in large part. He does begin his treatise with the statement that the object of metaphysics is "true being insofar as it is suitable for God, first and most perfect of all beings, and his creatures, which are weak expressions of his essence."⁹⁷ But he holds for analogical predication⁹⁸ and a real distinction between essence and existence.⁹⁹ On the other hand, he seems to accept an ontological argument: according to him, we can form a concept of God's essence and God's existence follows from his essence.¹⁰⁰ With respect to the principle of individuation, de Ceriziers rejects both the Thomist and Scotist views for the option called "double negation"; he asserts, "It is difficult to assign the ultimate difference that individuates Socrates and makes him be this man rather than another. Some think that the principle of individuation is ... a real difference that determines the thing's particular nature, in the way rational restricts animal to the species of man. As for me, I believe that it is being itself or existence, insofar as it has a negation, of unity with another thing and of division in itself."¹⁰¹

Another contemporary French Jesuit, Pierre Gautruche, in a work approved by the order, specifically argued "contra Thomistas" on various topics, such as prime matter existing without form.¹⁰² On the question of the plurality of human forms, Gautruche even identified a position against the reality of partial forms as the one held by Thomas, Francisco Suárez, and the Conimbricenses,¹⁰³ but sided with Scotus.¹⁰⁴ Gautruche also **(p.17)** rejected the Thomist doctrine of place, including the doctrine that the universe

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cannot move as a whole.¹⁰⁵

It might look as if early (perhaps Iberian and Roman) Jesuits were Thomist-leaning, but later (perhaps French) Jesuits were not. However, even this conclusion should be qualified. When one reads the extremely influential *Disputationes Metaphysicae* of the great Jesuit metaphysician Suárez, one is struck by the fact that in general he proceeded by considering issues in the light of his predecessors, especially Thomas and Scotus. In his Disputations, Suárez sided with Scotus almost as often as he sided with Thomas, though he also often took a direction that was his alone. Of course, even when he sided with Thomas or Scotus, he modified their doctrines significantly. Suárez accepted analogical predication, with Thomas,¹⁰⁶ but thought that a concept of being can be found which is strictly unitary¹⁰⁷ and, thus, he sided with Scotus on this issue: "the proper and adequate formal concept of being as such is one." Suárez added that this is the common opinion; its defenders are "Scotus and all his disciples."¹⁰⁸ He accepted the Scotist doctrine of matter existing without form by divine power (this leads him to being listed among the Scotists by the Doctrinaire Jean Vincent),¹⁰⁹ but he sided with Thomas on the plurality of forms.¹¹⁰ He argued, against both Thomas and Scotus, that the principle of individuation is matter and form¹¹¹ (rejecting both Thomas' *signate* matter and Scotus' haecceitas).¹¹² Most importantly, he argued against Thomas that there is a third distinction other than real and rational.¹¹³ He disputed the Thomist doctrine of a real distinction between essence and existence (calling it a distinction of reason with a basis in things) and between substance and accidents (though he rejected the Scotist formal distinction as vague and substituted instead what he called a modal distinction).¹¹⁴ Suárez, an important early Iberian Jesuit, seems to have been as much a Scotist as a Thomist (or perhaps may be better understood as neither Thomist nor Scotist).

It would seem that the Jesuits' propensity for Thomism has been greatly exaggerated. This makes room for Scotus as much as Thomas to have been considered the Master of the Schools in the seventeenth century; and, of course, it gave the Cartesians a better target to ridicule. The scope of philosophical teaching in French colleges was fairly broad, ranging from the Thomism of the Doctrinaires, to the Scotism of Paris and of at least the French Jesuits, to the eclecticism of the Oratorians. The Cartesians behind the *arret burlesque* could call Scotus the Master of the Schools because a Scotist bent was evident from their Parisian perspective in the second half of the seventeenth century.

(p.18) 1.2. Descartes and the Jesuits

Descartes spent his formative years (c.1606–14) with the Jesuits at La Flèche, the main Jesuit teaching college at the time, given that their once and future flagship college in Paris, Clermont (later named Louis-le-Grand), was not allowed to reopen until 1616. More than eight years with the Jesuits, from boyhood on, is supposed to have been a powerfully determinative experience for anyone. But Descartes seems not to have communicated with his former teachers after he left La Flèche until the publication of the *Discourse on Method*, some twenty-three years later. Writing to one of his teachers and sending him a copy of the *Discourse*, Descartes stated in 1637: "I am sure you would not have retained the names of all the students you had twenty-three or twenty-four years

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ago, when you taught philosophy at La Flèche, and that I am one of those who have been erased from your memory."¹¹⁵ In fact, the Jesuits did remember Descartes and an exchange of letters began. Descartes' correspondence with them can be regarded as three separate series of letters, each spanning a couple of years. First are the four letters to the Jesuits of La Flèche in 1637 and 1638, possibly to Etienne Noël or Antoine Vatier, requesting comments about the *Discourse*.¹¹⁶ Second is the series of letters written during 1640 to 1642, dealing with his dispute with Pierre Bourdin, and culminating with the Letter to Jacques Dinet, Provincial of the Jesuits for the Ile de France, published with the second edition of the *Meditations*. And third is the set of letters from 1644 to 1646, predominantly involving Denis Mesland, but also including others such as Etienne Charlet, Noël, and the now friendly Bourdin.¹¹⁷ For most of these letters, Clerselier, the editor of Descartes' Correspondence, does not provide the name of the correspondent or the date of the letter; he simply identifies them as "A un reuerend Pere Iesuite (To a reverend Jesuit Father)." Descartes himself generally (p.19) treated the Jesuits as if they were a collective whole; in the Seventh Set of Objections and Replies, he refers to the Jesuits as "a society which is very famous for its learning and piety, and whose members are all in such close union with each other that it is rare that anything is done by one of them which is not approved by all,"¹¹⁸ and he says in a letter to Constantijn Huygens: "since I understand the communication and union that exists among those of that order, the testimony of one of them alone is enough to allow me to hope that I will have them all on my side."¹¹⁹ Descartes generally acted as if talking to one Jesuit can be like talking to all of them: "their mathematician of Paris [Bourdin] has publicly refuted my *Dioptrics* in his theses—about which I have written to his Superior, in order to engage the whole order in this dispute."¹²⁰ Whether he was right or not was not as important as the fact that by dealing with Jesuits like Bourdin or Dinet, he thought he would be dealing with the whole order.

The relations between Descartes and the Jesuits took various unexpected turns. In the summer of 1640, Descartes told Huygens: "I am going to war with the Jesuits."¹²¹ From then on, Descartes fought skirmishes on many fronts, with many adversaries (both real and imagined), Jesuit and non-Jesuit. Those many battles and what has been called the "persecution" of the Cartesians are generally well known.¹²² Some actions were covert while others were fought openly. Following the hostilities precipitated by the disputation involving Bourdin, Descartes had numerous troubles with Protestants, culminating in condemnations at Utrecht in 1642 and Leiden in 1647.¹²³ After Descartes' death in 1650, Catholics at Louvain in 1662 condemned his works;¹²⁴ they were put on the Index of Prohibited Books in 1663.¹²⁵ The fighting intensified with numerous attacks in print.¹²⁶ As I have noted, the Cartesians counter-attacked with satires but also with learned essays,¹²⁷ and the anti-Cartesians retaliated with their own satires.¹²⁸ Ultimately, the dispute spilled into the official political arena, the domains of the King, of the universities, and of the teaching orders: after Louis XIV issued his anti-Cartesian edict in 1671, the faculty of arts at Paris tried to condemn Cartesianism in 1671, and succeeded in 1691;¹²⁹ there were skirmishes at the colleges of Angers and Caen during 1675–8;¹³⁰ the Oratorians, attempting to bring their teaching in line with that of the Jesuits, prohibited the teaching of Cartesianism in 1678, 131 and the Jesuits formally (p.20)

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condemned it in 1706.¹³² Though not the only enemies, the Jesuits are often thought to have been the fiercest. Francisque Bouillier, for example, in his *Histoire de la philosophie cartésienne*, devoted a whole chapter to them, stating that "because of the importance of their role in the battles against and in the persecutions of Cartesianism … they deserve a place apart in this history."¹³³

Clearly, not all the salvos in the war went in the same direction. After all, it was Descartes who satirized his own Jesuit education in the *Discourse*, saying that he had attended one of the most famous schools in Europe, but that he had gained nothing from his attempts to become educated: at best, "philosophy enables one to talk plausibly on all subjects and win the admiration of people less learned than oneself," but "there is nothing up to now which is not disputed and consequently doubtful" in it.¹³⁴ However, Descartes' thoughts about Jesuit education and his relations with them in general were much more complex than the statements of the Discourse would lead one to believe. He courted the Jesuits early on, and, when he got into trouble with Protestants at Utrecht in 1642, he tried to have them rally to his side, as a Catholic being attacked by the infidel.¹³⁵ In fact, the Jesuit role in the persecution seems limited: the battles between Descartes and Jesuits do not appear as significant or as numerous as those between Descartes and others.¹³⁶ The effect of the Jesuits needs to be inferred; in order to have enough materials about the Jesuits as persecutors of Descartes, Bouillier had to treat Huet, a non-Jesuit, as a Jesuit.¹³⁷ Still, the relations between Descartes and the Jesuits were, at bottom, intractable. The differences between them seem incommensurable, if not at the level of doctrine, at least at the level of pedagogy and pragmatics. The relations between Descartes and Bourdin provide ample examples to display those inherent difficulties.

In the summer of 1640 Mersenne was sending the *Meditations* to various savants, soliciting objections that would be published with the *Meditations*. Indeed, Descartes expected a set of objections from Bourdin, Professor of Mathematics at Clermont College, with whom Descartes had already exchanged some unpleasantries: Bourdin **(p.21)** had publicly criticized Descartes' writings on optics without giving Descartes the courtesy of alerting him to the criticism.¹³⁸ Bourdin ultimately sent Descartes his objections to the *Meditations*, but Descartes did not receive them in time for the first printing of the *Meditations* and *Objections and Replies*; he included them in the second printing as the *Seventh Set of Objections*. The exchange was not successful, to say the least. In his Letter to Dinet, published together with the *Seventh Set of Objections*, Descartes complained bitterly about Bourdin and dismissed his objections as silly or misguided. However, Bourdin's criticisms, though verbose, were far from silly. Bourdin does not generally strike one as a frivolous person; he looks a bit conservative, but not excessively so.

By 1640, when he debated with Descartes, Bourdin had already published three books, a *Geometry*, following Euclid, another *Geometry*,¹³⁹ and his *Cours de mathématique*.¹⁴⁰ A few years later he published his fourth, an *Introduction to Mathematics*.¹⁴¹ Bourdin's mathematics, as that of the Jesuits, can be characterized by its practical bent, evidenced by the contents of his books as well as by his two posthumous publications:

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L'architecture militaire ou l'art de fortifier les places regulières et irregulières and *Le dessein ou la perspective militaire* (both Paris, 1655). He also published a cosmological work consisting of a volume binding together two small treatises: *Sol flamma* and *Aphorismi analogici*. There he defended Tycho Brahe's cosmology against that of Aristotle and the Scholastics.¹⁴²

From Bourdin's writings, it would have been difficult to infer his being a dogmatic opponent of Descartes. Yet Descartes treated Bourdin as an unworthy critic: "what he does is to take fragments from my Meditations and ineptly piece them together so as to make a mask which will not so much cover as distort my features."¹⁴³ He sneered at Bourdin: "He is foisting on me ... a piece of reasoning that is worthy of himself alone," and "he finally reaches a conclusion which is wholly true when he says that in all these (**p.22**) matters he has 'merely displayed his weakness of mind.'"¹⁴⁴ Descartes overlaid his insults with the suggestion that Bourdin was not actually inept, but just pretended to be so—that he was playing the clown: "Yet it is embarrassing to see a Reverend Father so obsessed with the desire to quibble that he is driven to play the buffoon. In presenting himself as hesitant, slow and of meager intellect, he seems eager to imitate not so much the clowns of Roman comedy like Epidicus and Parmenon as the cheap comedian of the modern stage who aims to attempt to raise a laugh by his own ineptitude."¹⁴⁵ Ultimately, Descartes flatly accused Bourdin of being a liar:

The conclusion, unless I am wholly ignorant of what is meant by the verb "to lie," is that he is inexcusably lying—saying what he does not believe and knows to be false. Although I am very reluctant to use such a distasteful term, the defence of the truth I have undertaken requires of me that I should not refuse to call something by the proper word, when my critic is so unashamedly and openly guilty of the deed. Throughout this whole discussion he does virtually nothing else but repeat this foolish lie in a hundred different ways, and try to persuade and bludgeon the reader into accepting it.¹⁴⁶

Part of the problem with the *Seventh Set of Objections* was Bourdin's writing his objections in a dialogue form and with his penchant for rhetorical flourishes. The decision proved disastrous, as Descartes had the last word and undercut Bourdin's objections by interspersing his own replies within Bourdin's dialogue form, making the set of *Objections and Replies* extremely difficult to read. Bourdin's lengthy objections also suffered because Descartes mustered his considerable rhetorical skills in his even longer *Replies*. Descartes admitted that in his dealings with Bourdin he was sometimes unsure he had understood the thrust of his interlocutor's objections. In a revealing passage Descartes wrote to Mersenne: "I wish to believe that Father Bourdin did not understand my demonstration," but that does not prevent his objections from "containing cavils that were not merely invented through ignorance, but because of some subtlety that I do not understand."¹⁴⁷ Still, the overall structure of Bourdin's attack on Descartes is fairly clear.

Bourdin's objections are all directed against Descartes' method of doubt, and he clearly hoped to derail Descartes' enterprise from the start. His strategy was to show that the method failed either because it was untrue to itself, and smuggled in various principles,

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or because, if the method did not smuggle anything in, it went nowhere. (p.23) Bourdin alleged that doubt was itself a principle; therefore, the method smuggled in various principles.¹⁴⁸ Moreover, he argued that the principles Descartes smuggled in were defective in several ways. They were not as certain as the common principles denied by the method of doubt: "Let me come to your maxim 'If something appears certain to someone who is in doubt whether he is dreaming or awake, then it is certain—indeed so certain that it can be laid down as a basic principle of a scientific and metaphysical system of the highest certainty and exactness.' You have not at any point managed to make me consider this maxim to be as certain as the proposition that two and three make five."¹⁴⁹ And he tried to show that the principles smuggled in were not as worthy or as certain as the common principles ruled out by the method: "You promise us that you will establish by strong arguments that the human soul is not corporeal but wholly spiritual; yet if you have presupposed as the basic premise of your proofs the maxim 'Thinking is a property of the mind, or of a wholly spiritual and incorporeal thing,' will it not seem that you have presupposed, in slightly different words, the very result that was originally in guestion?"¹⁵⁰ Bourdin even supported his complaint by showing that it was not merely a hypothetical case, but that there were philosophers who held that thinking is a property of the body, so that their position cannot have been ruled out without a substantive principle.

With the second horn of the dilemma, Bourdin tried to show that the method produced nothing or that it proved too much.¹⁵¹ Bourdin noted that, in fact, the method could not produce anything as it rejected all means of argumentation and any major premise whatever: "The method is faulty in the implements it uses, for as long as it destroys the old without providing any replacements, it has no implements at all. ... If you propose any syllogism, it will be scared of the major premise, whatever it may be."¹⁵² More generally, Bourdin argued, the method was quixotic and imprudent: "The method goes astray by being excessive. That is, it attempts more than the laws of prudence demand of it, more, indeed, than any mortal demands."¹⁵³

Whatever Descartes may have thought about Bourdin's criticism, at least Bourdin's attack was consistent with Jesuit pedagogical practice. By restricting himself to a critique of Descartes' method, Bourdin did not have to engage any particular doctrinal point. Instead, he emphasized the difficulty that Jesuits would have with any method that espoused skepticism, even if only as a preliminary step. One of the more revealing exchanges between Descartes and Bourdin occurred over Bourdin's calling something Descartes had said "familiar even to the least novice." Descartes answered: "I would certainly not argue with the last statement. For I have never sought any praise for the novelty of my opinions."¹⁵⁴ Descartes' reply involved a delicate subject which was not directly raised by Bourdin, but which must have been a major worry for Descartes at **(p.24)** the time. Descartes was attacked for the novelty of his opinions; this was the subject of the condemnation of his works by the Academic Senate of Utrecht in 1642. Descartes dealt with the issue in his *Letter to Dinet*, where he denied the novelty of his opinions; here is the problem, as Descartes saw it:

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It may hardly seem likely that one person has managed to see more than hundreds of thousands of highly intelligent men who have followed the opinions that are commonly accepted in the Schools. Well-trodden and familiar pathways are always safer than new and unknown ones, and this maxim is particularly relevant because of theology. For the experience of many years has taught us that the traditional and common philosophy is consistent with theology, but it is uncertain whether this will be true of the new philosophy. For this reason some people maintain that the new philosophy should be prohibited and suppressed at the earliest opportunity, in case it should attract large numbers of inexperienced people who are avid for novelty, and thus gradually spread and gain momentum, disturbing the peace and tranquility of the Schools and the universities and even bringing new heresies into the Church.¹⁵⁵

According to Descartes, the solution to the problem—a solution he himself recognized as paradoxical—was that all of Peripatetic philosophy, insofar as it is different from other philosophies, is new, and that his is ancient. In fact, with respect to the principles of his philosophy, Descartes claimed that he accepted only those "which in the past have always been common ground among all philosophers without exception, and which are therefore the most ancient of all." And since what he deduced from these principles is contained in them, the truths deduced were equally ancient. The principles of the prevalent philosophy were new when Aristotle invented them and they should not be considered better now than they were then. Besides, "everything deduced from them is controversial and liable to be changed by individual philosophers, depending on the fashion in the Schools, and hence it is exceedingly new, since it is still being revised every day."¹⁵⁶

Descartes' defense might have seemed unconvincing. He did not say how he knew that all philosophers generally accepted his principles and why he thought that his principles were the most ancient of all. But it can be shown that his reply was not constructed after the fact, or just to satisfy the Magistrates of Utrecht. Descartes had already attempted on several occasions to avoid having his philosophy called novel. For example, in the 1638 letter to a Jesuit, Descartes had written: "I know that the principal reason which requires those of your order most carefully to reject all sorts of *novelties* in matters of philosophy is the fear they have that these reasons would also cause some changes in theology."¹⁵⁷ Similarly, in the Dedicatory Letter to the Deans (p.25) and Doctors of the Sorbonne, published with the Meditations in 1641, Descartes had rejected the judgment that his method was novel.¹⁵⁸ Thus, Descartes was not unaware of the potential risk his philosophy ran by being associated with novelty. Even though it did not resolve all the difficulties, Descartes' reply to Bourdin put into relief the element most necessary for understanding his defense against novelty. Descartes' philosophy is ancient because it is true, and one can understand that it is true because it is innate with us; thus, one can recognize its great age as soon as one becomes aware of its truth.¹⁵⁹ This may have been Descartes' strongest and only defense against the charge of novelty, but it is a weak defense that ultimately failed to convince anybody.

Descartes maintained such defense in his later works, elements of which even made their

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(**p.26**) As the seventeenth century wore on, however, the Jesuits became increasingly anti-Cartesian, as did many others in the teaching orders. A summary of a disputation by the Jesuits of Clermont College during 1665 gives a general assessment of the doctrinal difficulties associated with Cartesianism:

To say no more, the Cartesian hypothesis must be distasteful to mathematics, philosophy, and theology. To philosophy because it overthrows all its principles and ideas which commonsense has accepted for centuries; to mathematics, because it is applied to the explanation of natural things, which are of another kind, not without great disturbance of order; to theology, because it seems to follow from the hypothesis that (i) too much is attributed to the fortuitous concourse of corpuscles, which favors the atheist; (ii) there is no necessity to allow a substantial form in man, which favors the impious and dissolute; (iii) there can be no conversion of bread and wine in the Eucharist into the blood and body of Christ, nor can it be determined what is destroyed in that conversion, which favors heretics.¹⁶²

The summary is broken down into three main categories: the first, the complaint already issued at Utrecht, is the rejection of any novel philosophy. As we have seen, Descartes attempted to defend himself against that charge by arguing (unsuccessfully, it seems)

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that his philosophy was actually the oldest of all philosophies. The second refers to the Scholastic teaching about the objects of mathematics and natural philosophy, usually discussed under the topic of the classification of the sciences. Given that mathematics is an abstraction from natural things, the application of mathematics to natural things would be a "disturbance of order"; the Jesuit claim is that mathematical sciences should be subalternated to physics and not vice versa, as they seem to be with Descartes. The third category is itself divided into three parts, all concerning the relations between philosophy and theology. Cartesian philosophy is unfairly linked with atomism and the standard complaint against atomism is issued against it.¹⁶³ The disputants also object that man's substantial form is not necessary, something Descartes himself complained about with respect to Regius' exposition of his philosophy.¹⁶⁴ At last, we come to the issue of the Eucharist, which seems to have been the focus of opposition to Cartesianism in the second half of the seventeenth century. It was the issue to which Louis XIV's edict referred; it was alleged to be the cause of Descartes' works being placed on the Index; and it was specifically cited as a grounds for condemnation at Louvain.

1.3. Descartes and the Oratorians

The Oratorians' propensity for "Platonism" seems to have made them ripe for accepting Cartesian philosophy during the second half of the seventeenth century. This led one noted Cartesian scholar to assert that "Of all the teaching orders, the one who (p.27) embraced the new philosophy (Cartesianism) with the most zeal was the Oratory, and of all the Oratorian colleges none was more attached to Cartesianism than the College of Angers."¹⁶⁵ In fact, the Oratorians became the model for what Henri Gouhier called "l'augustinisme cartésianisé"—his category designating "Platonist" or Augustinian theologians who adopted Cartesian philosophy.¹⁶⁶ Another reason that might lead scholars to claim an attachment between Descartes and the Oratory was that Descartes maintained unusually good relations with Oratorians during his life. In the period when he felt he was at war with the Jesuits, he turned to the Oratorians for support, Guillaume Gibieuf in particular. Descartes had met Gibieuf when he returned to Paris (between April 1625 and the end of 1628) after a lengthy trip to Italy. At the time, Descartes believed that he was making progress on his method for avoiding sophisms (described in the Rules for the Direction of the Mind), and seemed ready to "mount the stage of the world," as he said. He recounted a meeting at the residence of the papal ambassador in which one M. de Chandoux, an alchemist, talked about his own new philosophy. As Descartes recalled, he used the occasion to correct Chandoux: "I made the whole company acknowledge what power the art of reasoning well has over the minds of those who are moderately educated, and the extent to which my principles are better established, more true and more natural, than any of those currently received in the learned world."¹⁶⁷ The large and distinguished audience included Bérulle. Following the meeting, according to Descartes, Bérulle granted him a private audience and encouraged him to develop his philosophy as an antidote to atheism. Bérulle died a year or so later, but in the interval Descartes formed a lasting relationship with Bérulle's second-incommand Gibieuf, Vicar-General of the Oratory, and with Charles de Condren, who succeeded Bérulle as the second General of the Oratory.¹⁶⁸

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One of the earliest pieces of correspondence Descartes kept was a letter he wrote to Gibieuf. In it Descartes thanked Gibieuf for "the honor he gives him of remembering him" and gently recalled the "service he was able to provide" for another Oratorian. Descartes used the occasion to announce that he was starting to write a short treatise, and to remind Gibieuf of his promise to correct it upon completion.¹⁶⁹ There are no extant letters between Descartes and Gibieuf in the 1630s, just an indirect correspondence mediated through Mersenne, and a few references to Gibieuf in Descartes' letters to the former. In two of the letters Descartes indicated that he agreed with what (p.28) Gibieuf wrote about God's freedom, as Mersenne related it to him, but that he had not yet read Gibieuf's book; in a third, Descartes thanked Mersenne for having forwarded the book to him.¹⁷⁰ Ten years later, Descartes was still saying that he agreed with what Gibieuf wrote about God's freedom: what he said about the subject was only a repetition of what Gibieuf had said.¹⁷¹ In 1638, Gibieuf wrote some comments on Descartes' *Discourse*. Descartes requested the comments from Mersenne,¹⁷² and after receiving them, indicated that he thought Gibieuf was "wholly on his side."¹⁷³ No doubt this episode was instrumental in Descartes' subsequent request to Mersenne to use Gibieuf in an attempt to obtain the approbation of the Sorbonne for the *Meditations*.¹⁷⁴ At the time Descartes felt that he needed the political backing of the Sorbonne against the "cavils of the ignorant"—that is, against the Jesuits and Bourdin in particular—and Gibieuf happened to be a member of the Sorbonne.¹⁷⁵ As Descartes claimed, he had resolved "to arm myself from now on, as much as I can, with the authority of others, since the truth is so little appreciated alone."¹⁷⁶ These machinations clearly worked to Descartes' satisfaction: Gibieuf seems to have given his approval,¹⁷⁷ and Descartes even expected to have won the protection of Condren, had he lived.¹⁷⁸ Still, it may be that Gibieuf's approbation was superficial, perhaps mostly in Descartes' mind. According to Gibieuf's biographer, the Oratorian Cloyseault, Gibieuf was troubled by Descartes' pronouncements on his favorite issue of God's freedom, and believed that Descartes had committed gross errors in this matter.¹⁷⁹

After Descartes' death, his philosophy found another Oratorian defender, Nicolas-Joseph Poisson. After studying at the Sorbonne, Poisson (1637–1710) joined the Oratorians in 1660 and became a priest in 1663. His first publication (1668) was an edition and French translation, with introduction and commentary, of Descartes' first work, Compendium musicae, as well as of Descartes' long letter to Constanijn Huygens known as the "Treatise on Mechanics." In 1671 Poisson published Commentaire ou Remarques sur la méthode de M. Descartes, où l'on établit plusieurs principes généraux nécessaires pour entendre toutes ses oeuvres, intending it to be the first of a series of commentaries on all of Descartes' works. Poisson was also urged by many to write a biography of Descartes. But a growing controversy over Descartes' philosophy induced him to abandon these projects and to return to ecclesiastical matters. When it became known that Poisson was about to publish his Remarks on Descartes' Method, the Council of the Oratory issued an order prohibiting the publication; but the (p.29) order came too late. A second order was sent to Poisson, summoning him to Paris and requesting he bring with him all printed copies of the work. The Oratory locked these up in the library at Vendome and took further steps to prevent dissemination of the book.¹⁸⁰ The difficulty in defending

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Cartesian philosophy is well illustrated by the final page of Poisson's *Commentaire*. There, in the "Avis de l'auteur," Poisson wrote that it is evident that he does not always agree with Descartes. But, he added, because of requirements placed on him by his superiors, he needed to assert—what may have been almost impossible to maintain—that "he does not claim to defend anything that the Catholic Church or even the least universities have condemned."¹⁸¹

It is clear that some Oratorians became attached to Cartesian philosophy during the second half of the seventeenth century. This persisted, despite warnings and reprimands by superiors, official edicts, or actual punishment by collegiate or university officials and the state. The extent and depth of the Oratory's teaching of Cartesian philosophy during the second half of the seventeenth century is what I wish to consider a bit more closely: How much Cartesian philosophy did Oratorians actually teach in their colleges and what might that philosophy have looked like?

Following the King's 1671 decree prohibiting the teaching of Cartesian philosophy, the Oratorian council formally prohibited all Oratorian professors "from teaching any new or suspect doctrine in its colleges"¹⁸² and, as early as 1673, one can find the General of the order eliciting a promise from Bernard Lamy, a priest of the Oratory who had just taught his first philosophy course at the College of Saumur, to stop teaching the opinions of Descartes.¹⁸³ Subsequently, Lamy and three other Oratorian professors (Fathers Eugène Fromentier, Cyprien de Villecrose, and Vincent Pélaut) of the College of Angers were disciplined for having disobeyed these mandates.¹⁸⁴ All this became interestingly more specific with the decree of the 1678 general assembly of the Oratorians. Recalling the King's edict, the Oratorians prohibited the teaching of Cartesian philosophy: In the teaching of "Physics, we must not depart from Aristotle's Physics nor his principles of Physics as commonly received in the colleges, in order to teach the new doctrine of Descartes, whose teaching the King has prohibited for good reasons."¹⁸⁵ The congregation also insisted that professors teach seven commonly received principles opposed to those of Descartes; they reaffirmed elements of the Scholastic metaphysics of matter and form, real accidents, the rational soul, and the possibility of the void and of the plurality of worlds.¹⁸⁶

Clearly, then, although some Oratorians were extremely wary of Cartesian philosophy, at least a few found it sufficiently appealing to teach it in their courses despite the threat of severe sanctions from various quarters. These same Oratorians, it can also **(p.30)** be shown, were Augustinian in theology.¹⁸⁷ Thus Gouhier's category of "augustinisme cartésianisé" is plausible.¹⁸⁸ Still, one should not oversimplify the relationship between Cartesianism and Augustinism, or the affinity of Augustinians for Cartesianism. As we have seen, Oratorians did prohibit the teaching of Cartesian philosophy. Augustinism and Cartesianism could just as easily undermine each other. In fact, one does not have to argue this thesis in the abstract; one can simply point to the anti-Cartesian work of the Oratorian Jean Baptiste de la Grange as concrete evidence.¹⁸⁹

De la Grange wrote a two-volume treatise, *Les principes de la philosophie contre les nouveaux philosophes, Descartes, Rohault, Régius, Gassendi, le p. Maignan, etc.,* which

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(**p.31**) For de la Grange, Descartes was a dangerous person, a thinker whose philosophy had been rightly condemned, based as it was on principles in some way inconsistent with Catholic theology: "It is not necessary to enter very far into the details of the propositions taught by Descartes to know that it is with good reason that His Majesty, who applies himself toward maintaining the peace in the Church, as well as toward upholding the interests of the Crown, has not long ago prohibited the teaching of this author's opinions in his kingdom."¹⁹⁶ The inconsistency that de la Grange warned against was not as straightforward as a direct conflict between Catholic theology and Cartesian philosophy. De la Grange believed that the bulk of the opposition between Catholic theology and Cartesian philosophy was indirect, a result of the direct opposition between Catholic that the ology by undermining the Scholastic philosophy upon which that theology had been based. Thus, de la Grange concentrated on pedagogic and heuristic elements in that opposition; among other things, he emphasized the deleterious effects inherent in the novelty of Cartesian philosophy:

One need only hear Descartes explain the greatest mysteries of the faith in a completely novel manner, and assert that all Catholic theologians have been mistaken until now, to become convinced that, even if his doctrine is not wrong, at least it is dangerous, and that professors of philosophy are completely wrong in

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However, de la Grange did not stop there. The remainder of his two volumes contained a most critical discussion of Descartes' principles, beginning with the rejection of the plurality of worlds, *Principles*, part II, art. 22:¹⁹⁸

For, who would believe that Descartes teaches only the truth and what is known clearly by the natural light when he asserts in article 22 of Principles, part II, that several worlds are impossible? Can anything more novel and more shocking to reason be uttered? Ever since people have reasoned about the works of God, there possibly has not been a single one who has dared to teach this doctrine, or even who has held this opinion. In fact, there is nothing that seems more clear and natural to us than to say that God, having produced this world, can still produce another? How could Descartes have put forth such an error?¹⁹⁹

De la Grange clearly exaggerates his criticism; the plurality of worlds had been discussed by many previous thinkers, and some of these did deny that there could be a plurality of worlds, even while conceding the Augustinian principle that God, having created this world, could create another.²⁰⁰ For example, Thomas Aquinas defended the singularity of the world in both his commentary on the *De caelo* and in his *Summa Theologiae*. In the former he denied the very *possibility* of plural worlds, given the (p.32) unlimited power of God: "However, it should be realized that some prove the possibility of many worlds in other ways. In one way, as follows: The world was made by God; but the power of God, since it is infinite, is not limited to this world alone. Therefore it is not reasonable to say that he cannot make yet other worlds." Aquinas replied that "if God were to make other worlds, he would make them either like or unlike this world. If entirely alike, they would be in vain—and that conflicts with his wisdom. If unlike, none of them would comprehend in itself every nature of sensible body; consequently no one of them would be perfect, but one perfect world would result from all of them." He also argued that the perfection and goodness of the world requires that it be unique.²⁰¹ In the *Summa*, Aquinas raised the question "Whether there is only one world?" The first objection recalled that "Augustine says (De diversis quaestionibus LXXXIII, quaest. 46), it is unfitting to say that God has created things without a reason. But for the same reason he created one, he could create many, since his power is not limited to the creation of one world; but rather it is infinite, as was shown above [quaest. 25, art. 2]."²⁰² Aquinas answered: "The very order of things created by God shows the unity of the world. For this world is called one by the unity of order, whereby some things are ordered to others. But whatever things come from God, have relation of order to each other, and to God himself, as shown above [quaest. 11, art. 3; quaest. 21, art.1]. Hence it must be that all things should belong to one world."²⁰³ Although the argument in the *De caelo* commentary was directed against the possibility of the plurality of worlds, the argument in the Summa was more ambiguous. It appears to conclude in the same fashion that the singularity or unity of the world is necessary, but the necessity at stake could be interpreted as hypothetical or consequential, as opposed to absolute necessity. In any case, the tide of philosophical

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opinion on this issue had clearly turned by the seventeenth century, and few thinkers then would have denied the possibility of a plurality of worlds.²⁰⁴

De la Grange continued his attack on *Principles*, article 22, arguing that Descartes' thesis was based on two "unproven" principles. The first unproven principle is Descartes' definition of matter as extension (entailing the indefinite extension of the world):

What I find amusing is that Descartes boldly teaches extremely dangerous conclusions, which he derives from two unproven principles. The first principle he assumes is *that wherever there is space there is matter, because whoever says space says extension, which is nothing other than matter*. One can see whether he brings forth any argument to establish that principle in *Principles* II, articles 16 and 19.

To the first unproven principle, Descartes adds a second principle, assumed erroneous by de la Grange, that two bodies cannot occupy the same place: **(p.33)**

The second principle he must necessarily assume in order to conclude that several worlds are impossible, and of which, however, he does not speak, is that two bodies cannot, absolutely speaking, be in the same place, and that matter cannot be in another matter. ... As a result, we must note that Descartes' conclusion that several worlds are impossible is not only false and dangerous, but also that it is derived from a dangerous principle that two bodies cannot be, absolutely speaking, in the same space.²⁰⁵

Plainly, the unstated "dangerous" principle, about the possibility of two bodies being in the same place, played a role in seventeenth-century discussions of the naturalistic explanation of the mystery of the Eucharist. For example, in the discussion of place in his *Corps de la philosophie*, Dupleix argued that, supernaturally, two bodies can be in the same place, and that, given the sacrament of the Eucharist, one body can be in two places.²⁰⁶ This was a common discussion in early seventeenth-century philosophy textbooks. Both questions—whether one body can occupy two places and whether two bodies can occupy one place—were answered affirmatively by Abra de Raconis in view of the problem of the Eucharist.²⁰⁷ And, as I have asserted, Eustachius held a similar doctrine. After maintaining that two bodies can be in one place by divine virtue, he argued that no incompatibility is involved in one body existing in several places. The example he gave for the latter proposition was that in the Sacred Eucharist the body of Christ is really and personally in several places.²⁰⁸

What is interesting for our purposes is that this issue was a point of contention between Thomists and Scotists in their discussions of the Eucharist—St Thomas formally rejecting the notions that one body can be in two places and two bodies in one place,²⁰⁹ and John Duns Scotus officially insisting that two bodies can be in one place.²¹⁰ Descartes seems to have ranked himself with the Thomists on this issue; ironically, de la Grange's criticism would also have held against St Thomas. Thus, it would be legitimate to suppose that de la Grange's criticism of Descartes would not, in general, be shared by Scholastics with a

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deep attachment to Thomist doctrine, but was more likely to find approbation with non-Thomist Scholastics; that is, those with Scotist (or Augustinian) tendencies.

This one example can be multiplied. De la Grange continued his critique of Descartes with analyses of such topics as whether animals can reason,²¹¹ the accidents (**p.34**) of the Eucharist, the nature of place and void, the infinity of the world, and the possibility of the void. De la Grange was an Oratorian—that is, an Augustinian—and anti-Cartesian philosopher all at once. We should emphasize that his reasons for being anti-Cartesian did not always coincide with the reasons Jesuits or Thomists usually gave against Descartes. Augustinism and Cartesianism simply do not need to be wedded to one another.

A further question arises: how transformed must Augustinianism and Cartesianism be in order for them to harmonize with one another? The data are readily available for at least a partial answer; that is, one can examine the Cartesianism of the Oratorian fathers at Angers, as evidenced in the censure of their theses, and especially that of Bernard Lamy, one of the Oratorians previously mentioned, for whom we have both the censure of his teaching and his subsequently published work.²¹² Now, it is clear that the Oratorian fathers at Angers were condemned for many reasons, and that teaching Cartesian principles was only one of those reasons. The censures of Villecrose and Pélaut would have been difficult to defend as condemnations of Cartesianism proper.²¹³ Even those of Fromentier and Lamy contained other elements that could not be described as Cartesian. There were thirteen propositions extracted by the censors from the teachings of Fromentier at the College of Angers during 1672 and 1673, only four of which were identified as Cartesian and criticized as such. In fact, one of the propositions, about the souls of animals, ran counter to Descartes' doctrine and was identified as non-Cartesian.²¹⁴ Ten of Lamy's sixteen propositions from his teaching at the College of Angers during 1674 and 1675 were identified as Cartesian and criticized as such, though the censor's criticism also ranged widely over other issues.

But there were plenty of criticisms of Cartesianism. In the case of Fromentier, the censor objected to his teaching that real accidents are not to be distinguished from substances, and to his explanation of the Eucharist without having recourse to real accidents, propositions identified as Cartesian.²¹⁵ The censor remarked that "The opinion of the Cartesians who claim that there are no species or real accidents in the Eucharist is contrary to the theology of the Holy Fathers and to the doctrine of the Church."²¹⁶ Moreover, he objected to the doctrine of the indefiniteness of the universe²¹⁷—a thesis (**p.35**) also identified as Cartesian²¹⁸—about which he declared: "As for the second principle, claiming that the world is infinite in its extension, it is not less dangerous than the first; it is true that the Cartesians do not wish to use the word infinite, which would be too odious, but only the word indefinite, which is the same thing, and which adds merely one syllable to everything that is said about the infinite."²¹⁹ Similarly, the censor objected to Cartesian doubt,²²⁰ against which he argued that: "To say that we must doubt all things is a principle that tends toward atheism and upsets the foundations of the highest of mysteries ... This principle manifestly entails atheism or at least the heresy of the Manicheans, who accepted a good and an evil principle for all creatures."²²¹ Finally,

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he criticized the atomism of Fromentier and Descartes,²²² even though both philosophers formally rejected atomism:

The opinion of Epicurus and Democritus, that the world has been formed by the fortunate encounter of atoms and small bodies flying about from all parts, has been treated as extravagant and impious. One wants to believe that Descartes and his followers do not teach that the universe was made by chance and without God's providence, but, at bottom, what they say is not different than what Democritus and Epicurus advance, since Descartes only wants God to have created all matter, divided it into almost equal parts, agitated these parts in various directions, each to its own proper center, and several around a common center; after that, God can remain at rest ... Is there something more odious in Epicurus' opinion not found in Descartes' hypothesis?²²³

In the case of Lamy, two of the censor objections concerned problems already raised against Fromentier about the explanation of the Eucharist. However, with Lamy, instead of protesting about real accidents, the censor objected to the definition of extension as the essence of body and to the rejection of substantial forms.²²⁴ The censor also derided Lamy's acceptance of the *cogito*, his consequent definition of the soul as *cogitatio*, the assertion that children think in their mother's womb, and the proposition that sensations such as pain are experienced in the soul, not in the body.²²⁵ He objected to Lamy's propositions that God is the principal cause of motion, that the quantity of motion is conserved, and that the only kind of movement is local motion.²²⁶ In short, it **(p.36)** is clear that Fathers Fromentier and Lamy were teaching a significant number of doctrines recognized as Cartesian at the College of Angers during the years 1672 to 1675.

Less than a decade later, Lamy published his *Entretiens sur les sciences*. There, he still showed himself to be a Cartesian to a certain extent, but in the portion of the work called "Discours sur la philosophie," he limited his approbation of Descartes. In the "Discours," Lamy talked about the air pump (something he said Descartes was unaware of) and the experimental knowledge his contemporaries derived from it, knowledge that went beyond what Descartes understood.²²⁷ He claimed that Descartes gave incorrect explanations of meteorological phenomena because of his lack of experiments.²²⁸ However, he credited Descartes with "having opened" the path of mechanism; namely, that "people no longer believe that something is known unless they can explain it mechanically." That is what he referred to as Descartes' "method" in the "Discours" and the focus of his approval:

It is with his method that one should be associated; I say his method, because most of his explanations must be regarded as reasonable conjectures rather than as the truth. What he asserts is always clever and in keeping with the hypotheses he made up; but that is not to say that what he advances is true ... It is therefore, once again, the method of this philosopher that one should accept in physics, rather than his particular opinions. We will find many of his opinions to be false to the extent that we will make more discoveries in physics.²²⁹

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Moreover, Lamy praised Descartes for his account of mind and the union of mind and body: "He is the one who has spoken the best about the mind and who has distinguished its functions from those of the machine of the body with the greatest clarity ... One can hardly add anything to what he teaches regarding the union of the soul and body."²³⁰ Lamy used the praise as an introduction to Malebranche's account of sensation and morals; these, he asserted, were based on the existence of God being proved by all things and the dependence all creatures have on him.²³¹ According to Lamy, "These are all the principles of the new philosophy of Descartes, before whom nobody has shown so clearly the relation of man to God."²³²

Still, in order to understand what Lamy found most appealing about Descartes, one has to investigate further what he thought Descartes' "method" amounted to. Lamy talked of method in "Idée de la logique," another of the Entretiens, without mentioning Descartes at all-although the themes discussed by him were Cartesian (and Malebranchian) and reminiscent of the *Meditations* (together with their representation in *Principles*, part I). For example, one can find the Cartesian criterion of truth as God's guarantee that clear and distinct ideas are true: "Humans are made in such that, in the same way that they are attracted by the good, they are compelled by clear and distinct knowledge, which requires their consent. And hence they are not deceived, (p.37) since nature, which is good, cannot require them to consent to what would be false. I understand by nature here the Author of all things, or the very things such as he has made them."²³³ One can also see various versions of the *cogito*: "When we are reflecting on [the fact that] we are thinking, we cannot doubt that we are existing."²³⁴ And again: "But, after all that, when I consider that whether I am awake or asleep, whether or not I am being deceived, whether or not I have wings, I am. For if I am being deceived, I am therefore deceived; therefore *I am*. Thus, I must consent to [the fact] that I exist."²³⁵ Furthermore, one can find the Cartesian distinction between the understanding and the will: "There are, properly speaking, only two different operations of the mind. We perceive by means of the first; we consent by means of the second."²³⁶

However, Lamy's Cartesianism was framed in a context that Descartes would not have recognized. Lamy began his "Idée de la logique" by asserting "We are the work of God; we therefore have no cause for believing that our nature is defective."²³⁷ The principle could be given a Cartesian interpretation, but Lamy took it further than one might have expected. For Lamy, a consequence of the principle was that we can always determine the truth simply by being attentive: "Attention constitutes the principal part of wisdom ... An attentive mind is capable of everything."²³⁸ Lamy had so little doubt about the human capacity for knowledge that he even thought one accepted false religions (as Protestants did, according to him) simply because of lack of attention.²³⁹ The other aspect of Lamy's optimism was that his notion of a clear idea encompassed much that Descartes would never have thought of as a clear and distinct idea. In fact, Lamy used an example of a tree in front of him as a model of a clear idea, *at the level of the cogito:* "When something is proposed to us with complete clearness, it is not in our power to believe that it is not what it appears to us.... For example, when we reflect on [the fact that] we are thinking, we cannot doubt that we are existing. I see clearly this tree before me, I touch it, I

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cannot doubt that it is not there, because this idea of ourselves and of this tree that I touch contains within it the idea of an actual existence."²⁴⁰ True, Lamy did not go so far as to suggest that the senses give us *what* the tree is, just *that* it is. Nevertheless, Lamy went well beyond Descartes' conclusion in the Sixth Meditation, that the senses tell us that bodies exist, suggesting that the senses tell us that a particular body exists. Descartes would not have thought that the tree could be perceived clearly, nor that the tree would be known to exist with the same degree of certainty with which I know myself to exist. Lamy's Cartesianism seemed to have gone in the direction of an empirical version. However, Lamy remained agnostic about the veracity of the senses: "I cannot examine here whether the senses are deceitful or not; lacking this (**p.38**) examination, it suffices, in order not to be mistaken, to consent only to our having such and such ideas and such sensations on such and such occasions. And since this is the only clear thing, it is the only thing we must accept."²⁴¹ Still, Lamy was enough of an Augustinian that he wished to defend the proposition that there are spiritual ideas we find inside us taught to us by nature: "he who is always [seeking what is] outside of himself, who thinks only of things he finds in bodies, is not capable of [consciously] perceiving everything that nature requires him to receive as true."²⁴² This resonated better with Cartesianism, but it looked more Augustinian than Cartesian.²⁴³

The overall impression is that Lamy was an Augustinian who dabbled in Cartesianism. Since there was no Cartesian order and linkage of reasons in his philosophy,²⁴⁴ Lamy could pick and choose among Cartesian doctrines, modifying them to suit his Augustinianism. By putting Cartesian philosophy at the level of an empirical science, he could preserve his Augustinian theology as more basic and untouchable. Lamy fits nicely into the category of "augustinisme cartésianisé"; for him, in general, the Cartesianism was made to fit the Augustinianism.

Yet we should not conclude that the move toward Cartesian "empiricism" was a phenomenon proper to "augustinisme cartésianisé" alone. An even more radical form of Cartesian empiricism can be found in the category of "cartésianisme augustinisé," namely in the work of François Bayle.²⁴⁵ Bayle's main philosophical work, *The General Systeme of* the Cartesian Philosophy (1670)—surviving only in English translation—was a synopsis of the Cartesian system, constructed out of Descartes' whole corpus. In it, Bayle went through the Cartesian system in an order somewhat reminiscent of the *Principles*: he detailed the *cogito*, the consequence that the soul knows itself better than it knows any other thing, both proofs for the existence of God, God's guarantee that we cannot err in what we clearly and distinctly know, the certainty of the existence of bodies, that errors proceed from the ill-use of our freedom, etc. However, he concluded the first book, treating metaphysics, with the following remark: "when we say that the certainty of our Understanding is greater than that of our Senses, we mean nothing else, than that the judgments we form in a riper age, by reason of some new Observations we have made, are more certain than those, we have formed from infancy, without having reflected on them."²⁴⁶ Bayle did make the final turn into empirical Cartesianism. (p.39) For him the corrective for the prejudices of childhood was not reason, but experience. His empiricism became even more marked in his later works.

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We can reaffirm the fertility of Gouhier's categories, but we will find many shades of Cartesianism within them. Clearly, individual Oratorians seem to have had a penchant for Cartesian philosophy, while the order as a whole remained hostile to it-whether for intellectual or political reasons. Descartes seemed to have received some encouragement for his philosophy from the highest levels of the order—from Bérulle and Gibieuf—during his lifetime. But the situation changed after his death. Although the Oratorians could tolerate such Cartesians as Malebranche, it could also countenance anti-Cartesians such as de la Grange. The few Oratorians who taught Cartesian philosophy—Lamy and Fromentier, for example-got into trouble (as did Poisson). The society did formally prohibit the teaching of Cartesian philosophy. It would take us too far afield to do more than to speculate briefly about the reasons for this official condemnation. Pierre Bayle thought that the Jesuits pressured the Oratorians to renounce Descartes' philosophy, because they feared that Oratorian colleges would attract all the young students "who prefer the new philosophy a hundred times more than the old one."²⁴⁷ But that seems unlikely. More probable is the association of Jansenism with Cartesianism that was frequently proposed during the late seventeenth century: "les deux plus grands Ennemis qu'ait à present l'Eglise, les Jansenistes et les Carthistes" (the two greatest enemies the Church has at present, the Jansenists and the Cartesians), as the narrator of the events at Angers says.²⁴⁸ Oratorians must have had enough political pressures defending themselves against the former charge that they might not have wanted to defend themselves against the latter one as well. Still, Oratorians did teach Cartesian philosophy and continued to propound it in print. Taking Lamy's writings as evidence, what Oratorians defended—an empirical version of Cartesianism—seems only distantly related to Descartes' philosophy. Ultimately, this movement toward an empirical Cartesianism might have been independent of socio-political (p.40) reasons. Given that we find a quasi-Cartesian empiricism in the Oratorian Lamy, and a full-fledged Cartesian empiricism in the Lanterniste Bayle, we can wonder at the intellectual forces in the second half of the seventeenth century driving Augustinians who became Cartesianized and Cartesians who became Augustinized to tend toward a kind of empiricism.

Notes:

(1) This is from a census in 1762; see Brockliss 1987, 22.

(2) Jean Duhamel, *Quaedam recentiorum philosophorum, ac praesertim Cartesii, propositiones damnatae ac prohibitae.* in Duhamel 1705, v. 17–18. It is thought that the Jesuits were behind this condemnation, acting through Louis XIV's Jesuit confessor Jean Ferrier. See Schmaltz 2002, 29–34.

(3) I.e. Antoine Villon, Etienne de Clave, and Jean Bitauld. See Garber 2002.

(4) Positiones Publicae, in de Launoy 1653, 128-9.

(5) De Launoy 1653, 132.

(6) Duplessis d'Argentré 1726–38, ii. 147.

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(7) Louis Phelypeaux, in Babin 1679, 6.

(8) Some of them also wrote satirical verses: "Tumultaire amas de quatre Facultez, / Bizarres Universitez, / Qui pour me chasser de la France, / Feittes la geurre à toute outrance, / Croyez-vous vos voeux exaucez / Parce que vous me bannissez, / De l'enceinte de vos Colleges / Comme un faiseur de Sacrileges? ... / N'est-ce point, Recteurs bilieux, / Ce qui vous donnant dans les yeux / Vous à remplis de jalousie, / Contre nôtre Philosophie ... " See "Monsieur Descartes aux Universitez, Sur la defense de l'enseigner, qu'elles se sont procurées," in Babin 1679, 15–17.

(9) "Arrest Donné en Faveur des Maistres és Arts et Professeurs en l'Université de Paris, pour la doctrine d'Aristote," in Babin 1679, 19.

(10) Brockliss 1987, 338.

(11) Some of this section is a revised version of ch. 2 of Ariew 1999a and 2011.

(12) "In theology there should be lectures on the Old and New Testaments and on the Scholastic doctrine of Saint Thomas. ... In logic, natural and moral philosophy, and metaphysics, the doctrine of Aristotle should be followed, as also in the other liberal arts." St. Ignatius 1970, 220–1.

(13) Rochemonteix 1889, i. 4n.–6n.

(14) Rochemonteix 1889, i. 4n.–6n.

(15) Rochemonteix 1889, iv. 11n.-12n.

(16) Rochemonteix 1889, iv. 11n.-12n.

(17) Rochemonteix 1889, iv. 11n.-12n.

(18) For an excellent account of these variations, see Schmutz 2002: 51-81.

(19) And following Aristotle does not usually mean what we would mean by it. We need only consider the case of Théophraste Bouju whose 1614 *Corps de toute la philosophie* was subtitled: "Le tout par demonstration et auctorité d'Aristote, avec eclaircissement de sa doctrine par luy-mesme." Despite the subtitle, Bouju's opinions diverged enormously from orthodox Aristotelianism.

(20) Goudin was born in Limoges 1639 and died in Paris 1695. He became a Dominican in 1657. He taught philosophy and theology at Limoges, Avignon, Brive, and Paris (the latter from 1672 on).

(21) See Narciso 1960, 124–47. I am indebted to the Scholasticon entry on Goudin for this bibliographical reference (www.ulb.ac.be/philo/scholasticon/nomenG.htm#goudin).

(22) Sacra Studiorum Congregatio 1914: 383-6.

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- (23) Goudin 1726 [1668], Metaphysica, quaest. 1, art. 2, p. 188.
- (24) Goudin 1726 [1668], Metaphysica, p. 200.
- (25) Goudin 1726 [1668], Metaphysica, p. 203.
- (26) Goudin 1726 [1668], Metaphysica, p. 207.
- (27) Goudin 1726 [1668], Metaphysica, p. 200.
- (28) Goudin 1726 [1668], *Metaphysica*, p. 208.
- (29) Goudin 1726 [1668], *Metaphysica*, p. 224; see also p. 226.
- (30) Goudin 1726 [1668], *Metaphysica* II, quaest. 2, art. 1, pp. 255–7.
- (31) Goudin 1726 [1668], Physica I, axiom 2, p. 48.
- (32) Goudin 1726 [1668], Physica I, disp. 1, quaest. 2, art. 2, p. 69.
- (33) Goudin 1726 [1668], Physica I, disp. 1, quaest. 2, art. 4, p. 77.
- (34) Goudin 1726 [1668], *Metaphysica*, quaest. 3, art. 1, p. 219.
- (35) Goudin 1726 [1668], Metaphysica, p. 221.
- (36) Goudin 1726 [1668], Physica I, thesis 3, quaest. 4, p. 315.

(37) See Goudin 1726 [1668], *Physica* IV, quaest. 4, art. 2: "the object of the human intellect in its state of life is the quiddity of material or sensible things and what can be deduced out of them. That is the doctrine of Saint Thomas," p. 404.

(38) Goudin 1726 [1668], *Physica* IV, quaest. 4, art. 3, p. 408. The issue plays a role in the debates about (Thomist) intellectualist versus (Scotist) voluntarist moral philosophy.

- (39) Goudin 1726 [1668], *Physica* III, quaest. 1, art. 3, p. 117.
- (40) Goudin 1726 [1668], *Physica* III, quaest. 2, art. 3, pp. 132–3.
- (41) Goudin 1726 [1668], Physica IV, quaest. 1, art. 3, pp. 238-46, esp. pp. 243-4.
- (42) See Goudin 1726 [1668], Physica IV, quaest. 4, art. 2, p. 404.
- (43) Goudin 1726 [1668], *Metaphysica*, quaest. proem., art. 1, p. 183.
- (44) Goudin 1726 [1668], *Metaphysica*, disp. 2, quaest. 1, art. 1, pp. 240–52.
- (45) Goudin 1726 [1668], p. 244.
- (46) Scotus 1639, Opus Oxoniense I, dist. 3, quaest. 3.

(47) Aquinas 1964–76, I, quaest. 84, art. 7.

(48) Scotus 1639, Opus Oxoniense, II, dist. 3, quaest. 2.

(49) Scotus 1639, Opus Oxoniense, I, dist. 3, quaest. 1-2.

(50) Scotus 1639, Opus Oxoniense, II, dist. 12, quaest. 1.

(51) Scotus 1639, Opus Oxoniense, II, dist. 3, quaest. 6.

(52) Scotus 1639, *Quaestiones quodlibetales*, quaest. 10, art. 2.

(53) Scotus 1639, Opus Oxoniense, IV, dist. 11, quaest. 3.

(54) There were other points of disagreement between Thomists and Scotists, some of which played an important role in seventeenth-cent. debates, but they were no longer thought essential to Thomism as defined in the 20th cent. For example, Thomist theory of place required the immobility of the universe as a whole as the frame of reference for motion (Aquinas 1953, IV, lectio 8; see Goudin 1726 [1668], *Physica* I, thesis 3, quaest. 4, art. 1) whereas for Scotists space was radically relative: there is no absolute frame of reference for motion (Scotus 1639, *Quaestiones Quodlibetales*, quaest. XII). Similarly, Thomists thought that without motion there would be no time (Aquinas 1953, IV, lectio 16–17; see Goudin, *Physica* I, thesis 3, quaest. 3, art. 2), whereas Scotists thought that time was independent of motion (Scotus 1639, *Quaestiones Quodlibetales*, quaest. 11). It should be clear that I am not claiming completeness in my inventory of the divergences between Thomism and Scotism. As I will show in Ch. 2, on moral philosophy, there is, as well, a significant debate between Thomists and Scotists about what constitutes happiness in the afterlife, whether it consists in the vision of the divine essence, and thus resides in the intellect (Thomists), or in the love of God, and thus is part of the will (Scotists).

(55) Maillard 1975, 188.

(56) De Raconis (*c*.1580–1646) taught philosophy at the Parisian colleges of des Grassins and du Plessis (from about 1610 on) and held a chair in theology in the Collège de Navarre, Paris (1616). He published *Summa Totius Philosophiae* (1617, with many editions variously titled to 1651).

(57) Dupleix (1569–1661) was the tutor to the son of Marguerite de Valois, first wife of Henry IV. From 1603 to 1610 he published various volumes of an extremely popular French-language philosophy textbook (*Logique, Physique, Metaphysique, and Ethique*), ultimately issued as *Corps de philosophie*, with various editions until the 1650s.

(58) Eustachius 1629 [1609], Metaphysica, praef. quaest, 2, p. 1.

(59) Eustachius 1629 [1609], Metaphysica, pars II, disp. 2, quaest. 4, p. 24.

(60) Eustachius 1629 [1609], Metaphysica, pars IV, disp. 3, quaest. 1, p. 71.
(61) Eustachius 1629 [1609], quaest. 2, pp. 73-4.

(62) Eustachius 1629 [1609], p. 15.

(63) Eustachius 1629 [1609], *Metaphysica*, pars III, disp. 3, quaest. 5–8, pp. 52–5.

(64) Eustachius 1629 [1609], Physica, pars I, disp. II, q. 4, pp. 16–17.

(65) Eustachius 1629 [1609], *Physica*, pars III, tract. I, disp. 1, quaest. 6, pp. 174–5.

(66) Eustachius 1629 [1609], *Metaphysica, tractatus de proprietatibus entis*, disp. 2, quaest. 4, pp. 38–9. See also de Raconis 1651, *Metaphysica*, tract. 4, sec. 2, 4, brevis appendix, pp. 76–8, and Dupleix 1992 [1610], p. 235.

(67) Eustachius 1629 [1609], Physica, tract. 3, 2nd disp., quaest. 1, pp. 56-8.

(68) Eustachius 1629 [1609], *Physica*, pars 1, tract. 3, disp. 2, quaest. 3, p. 59. See also de Raconis 1651, *Physica*, tract. 2, quaest. 1 and 2, esp. pp. 207, 216, and Dupleix 1990 [1603], 261–2.

(69) Eustachius 1629 [1609], *Physica*, tract. 3, quaest. 2, pp. 63–4. See also Dupleix 1990 [1603], 299–303. But see Edwards 2013 for some fine-tuning on these remarks.

(70) There are a number of fairly recent general works on the Oratory: de Polignac 1968; Boureau 991; d'Ambrieres 1995. The main work about Oratorian education remains Lallemand 1888. There are a few interesting studies of particular Oratorian colleges: Maillard 1975 and Julia et al. 1993. The main biographical source for Oratorians is Batterel 1904.

(71) In addition to Bérulle, the priests included Jean Bence and Jacques Gastaud, Doctors of Theology from the Sorbonne, François Bourgoing and Paul Métézeau, Bachelors of Theology, also from the Sorbonne, and Pierre Caron, Curé de Beaumont.

(72) The standard works on Bérulle are: Dagens 1952 and Houssaye 1874.

(73) The principal colleges that the Oratorians established between 1614 and 1629 were located at Dieppe, Riom, Angers, Pézenas, Marseille, Vendôme, Le Mans, Beaune, Montbrison, Nantes, Saumur, Condom, and Forez. From 1630 to 1762, the Oratory also established colleges at Troyes, Provins, Soissons, and Toulon, among others. After 1762 they took control of a number of Jesuit colleges: Agen, Arras, Autun, Béthune, Lyon, and Tours. See Lallemand 1888, chs. 2 and 3.

(74) As already indicated, the Jesuits were expelled from France in 1594 but readmitted in 1603. That is why the collège Henri IV in La Flèche opened in 1604; the collège Clermont in Paris, founded in 1563, did not reopen until 1616. When the Jesuits were expelled from France for the second time in 1762, La Flèche was given to the Doctrinaires and Clermont (now called Louis-le-Grand) to the University of Paris, across

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(75) The Oratorians codified their teaching in their own *ratio studiorum*, published by Jean Morin in 1645. See Lallemand 1888, 231.

(76) According to Lallemand, the primary teaching in the lower classes was in French and in the higher classes in French and Latin. He also asserts that Oratorians taught Latin as a dead language (1888, 212, 240).

(77) Referring broadly to Plato and Augustine, and ultimately also to Scotism.

(78) Chalmers 1632.

(79) Batterel 1904, i. 261.

(80) Fournenc 1655. Batterel 1904, ii. 497: "tout s'y traite par Aristote ou par Platon, qui, dans la concurrence avec son disciple, a, d'ordinaire, le pas et la préférence."

(81) See Batterel 1904, iii. 142–54.

(82) A teaching order founded by César de Bus just before the turn of the seventeenth cent. The first Doctrinaire college was founded at Brive in 1619, five years after the Oratorians founded their first college at Dieppe. For more on the Doctrinaires and their teaching, see de Viguerie 1976.

(83) Vincent 1660–71, i, q. 2, sect. 5, pp. 74–5, "Utrum materia propriam habeat existentiam." See also de Viguerie 1976, 534–8.

(84) "Materiam non haberet propriam existentiam" and answering negatively "An materia possit divinitus existere sine forma" (sect. 6) and "Utrum materia possit naturaliter existere sine forma" (sect. 7). Note that the principal Jesuit metaphysician Francisco Suárez is cited as a supporter of the first (Scotist) view.

(85) Toletus 1589, quaest. 13, fo. 34^{v} . Théophraste Bouju also followed the Thomist line about the reality prime matter. See Bouju 1614, i. 315–16, 319–20, 322, 326–7, 329–31.

(86) Toletus 1615 [1574], ii, cap. 3, quaest. 7.

(87) Toletus 1589, iv, quaest. V: "An locus sit immobilis," fos. 120^{r} - 121^{r} . Cf. Grant 1976, 137-67.

(88) Toletus 1589, iv, quaest. 12, fos. 142^v-143^v.

(89) Toletus 1869–70, iv. 200–1, 215–22, 240–1, 243–6, 255–8.

(90) The title-page of the work says "Avec permission des Superieurs," though by then de Ceriziers had left the order to become almoner of the Duc d'Orleans. René de Ceriziers (or Cerisiers) was born in Nantes in 1603 and entered the Jesuit order in

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1622; he taught humanities and philosophy. He left the Jesuits in 1641 and became almoner for the duc d'Orleans and then Louis XIV. He died in Paris in 1662. He wrote some religious and hagiographical works that were reprinted numerous times and translated into many other languages. He himself translated the chief works of Augustine and Boethius into French (also reprinted frequently).

(91) De Ceriziers 1643, i. 57.

(92) De Ceriziers 1643, i. 99-103.

(93) De Ceriziers 1643, i. 103–5.

(94) De Ceriziers 1643, i. 112.

(95) De Ceriziers 1643, i. 93–4, though he does not say enough for me to be very confident about it.

(96) De Ceriziers 1643, i. 116. For de Ceriziers' rejection of the arguments claiming that an actually infinite world would be impossible, see 116–19.

(97) De Ceriziers 1643, iii. 1.

(98) De Ceriziers 1643, iii. 6-7.

(99) De Ceriziers 1643, iii. 15–18.

(100) De Ceriziers 1643, iii. 50-2.

(101) De Ceriziers 1643, iii. 31.

(102) See Gautruche 1665, ii. Physica Universalis, 27. Gautruche was born in Orléans in 1602. He entered the Society of Jesus in 1621, after having studied at Rennes. He taught philosophy at Rennes (1642–4) and perhaps at La Flèche. In 1653, he returned to the collège du Mont at Rennes as prefect of studies and professor of theology, posts which he kept until 1679. He died in Caen in 1681. For more on Gautruche, see Brockliss 1992, 55–89; 1995, 187–219.

(103) Gautruche 1665, *Physica*, 40.

(104) Gautruche 1665, Physica, 41.

(105) Gautruche 1665, ii. 331.

(106) Suárez 1998, disp. 28, sect. 3, no. 2.

(107) Suárez 1998, disp. 2, sect. 3, no. 7.

(108) Suárez 1998, disp. 2, sect. 1, no. 9.

(109) Suárez 1998, disp. 34, sect. 5, no. 36.

(110) Suárez 1998, disp. 15, sect. 10, no. 61.

(111) Suárez 1998, disp. 5, sect. 2, nos. 8-9.

(112) Suárez 1998, disp. 5, sect. 6, no. 15.

(113) Suárez 1998, disp. 7, sect. 1, no. 16.

(114) Suárez 1998, disp. 31, sect. 1, no. 3.

(115) AT i. 383.

(116) Noël (1581–1659) taught philosophy and theology at La Flèche when Descartes was a student and later became its rector. He published some physical treatises in which he deviated from strict Aristotelianism and disputed the conclusions of Blaise Pascal's experiments on the void. Vatier (1591–1659) studied philosophy at La Flèche (1615–18, just after Descartes had left) and stayed to teach humanities and mathematics (1618–21). He taught philosophy in Paris when Descartes resided there and returned to La Flèche as professor of philosophy and theology (1630–2 and 1634–42). Descartes received some letters from Vatier praising the *Discourse*; he was quite pleased by this approbation, mentioning it a number of times. In one of his letters to Mesland, Descartes even asked for Vatier's opinion of his explanation of the Eucharist.

(117) Mesland (1615–72) was one of the few Jesuits to receive Descartes' *Meditations* enthusiastically, going so far as to compose a summary of this text that would be suitable for use in the schools (AT iv. 122). A footnote in the original Adam and Tannery edn of Descartes' works suggests that Mesland was "consigned to Canada" in 1646 as punishment for his association with Descartes (AT iv. 345n.). However, Mesland was assigned first to Martinique and then to Santa Fe (now Bogotá) in Nouvelle-Grenade (now Colombia). Moreover, the evidence suggests that he requested the assignment in order to carry out his plan of "converting the savages" (AT iv. 345). This mission deprived Descartes of a trusted friend, but also of a potentially valuable religious ally. Charlet (1570–1652) entered the Jesuits in 1589 and became professor of theology at La Flèche in 1606 and rector there from 1608 to 1616 (during Descartes' stay at the college). He subsequently held various significant administrative offices in the order. He was distantly related to Descartes and seems to have looked after him during his school years. As Descartes wrote to him: "you have acted like a father to me throughout my youth" (AT iv. 156).

(118) AT vii. 452; CSM ii. 303. See also the *Letter to Dinet*, AT vii. 564.

(119) AT ii. 50. See also Ariew 1995.

(120) AT iii. 103.

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(121) AT iii. 103.

(122) See McClaughlin 1979.

(123) Verbeek 1988, 1992. There were plenty of other skirmishes, of course.

(124) D'Argentré 1726-38, iii/2. 303-4.

(125) Bouillier 1868, i. 446–7. In their 2003 article, Armogathe and Carraud show, as previously suspected, that the Louvain condemnations were the catalyst for having Descartes' works put on the Index in 1663.

(126) See e.g. the work of the Jesuit de la Ville [le Valois] 1680, the Doctrinaire Vincent 1677, the Oratorian de la Grange 1682, and of others such as Huet 1689 and Duhamel 1692.

(127) See the "Arret burlesque," in Boileau 1747, iii. 150–3. [Arnauld?] in Boileau 1747 (repr. in Cousin 1866, iii. 303–17). See also Bayle 1684.

(128) The Jesuit Gabriel Daniel, 1690; M. G. de L'A. [Pierre Daniel Huet] 1692; Daniel 1693.

(129) D'Argentré, 1726–38, i. 149.

(130) For an account of the events at Angers, see Babin 1679.

(131) Concordat entre les Jesuites et les Peres de l'Oratoire, Actes de la Sixiéme Assemblée, September 1678, in Bayle 1684, 11–12.

(132) Rochemonteix 1889, iv. 89–93. The full text is given in Ariew 1994. These Jesuit condemnations were widespread; there is even a discussion of them in the correspondence between G. W. Leibniz and the Jesuit B. Des Bosses. Leibniz 1875–90, ii. 311–507.

(133) Bouillier 1868, i. 571.

(134) AT vi. 5–9, 16. Also: "as for the sciences, inasmuch as they borrow their principles from philosophy ... no solid building could have been constructed on such shaky foundations."

(135) See the Letter to Dinet, AT vii. 563–603, especially the end of the letter, pp. 582ff.

(136) Though Arnauld and Baillet believed that the Jesuits—or at least one Jesuit, Fabri caused Descartes' works to be put on the Index. See Bouillier 1868, i. 466–7. See also the anonymous *Plusieurs raisons pour empêcher la censure ou la condemnation de la philosophie de Descartes*, reprinted in Cousin 1856. Cousin claims to have evidence that the treatise was written by Arnauld. In any case, whoever wrote the treatise clearly blamed the Jesuits for using the Descartes affair in order to stir up troubles against

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"Jansenists" (such as Arnauld).

(137) Bouillier 1868, i, ch. 28. Huet was certainly a friend of the Jesuits. Victor Cousin also thought the Jesuits were behind the Cartesians' persecution from 1663 to 1706, but he had to treat the University of Louvain and non-Jesuit professors such as Plempius as pawns of the Jesuits in order to make his point. The Jesuits' involvement might have been genuine, but it was certainly indirect.

(138) Bourdin was born in 1595, a year before Descartes. He became professor of humanities at La Flèche just after Descartes had left (1618–23). He returned as professor of rhetoric in 1633 and taught mathematics the following year. In 1635 he was sent to Clermont where he stayed until his death in 1653.

(139) Bourdin 1639, divided into *geometria speculativa*, *geometria practica*, *notae geometrica*, and *aditus in arithmetica*. Bourdin 1640.

(140) Bourdin 1661. The reason why I include this work among those published by Bourdin on or before 1640 is that an anonymous 1645 work was identified as a revised edn; the 1645 work contains plates dated 1631. Thus 1631 is probably the date of the 1st edn, with printings in 1640 and 1641. See Jones 1947. The *Cours de mathématique* also contains materials on fortifications, terrain, military architecture, and sections on cosmography and the use of a terrestrial globe.

(141) Bourdin 1643, I: géometrie; II: géometrie de raison; III: abrégé de l'arithmétique.

(142) Bourdin 1646. The authorship of the two treatises is unsure. All attribute *Aphorismi analogici* to Bourdin, but some attribute *Sol Flamma* to the Jesuit, Etienne Noël.

(143) AT vii. 454; CSM ii. 304. Descartes compared his reasoning to that of children: "I am amazed that his ingenuity has been unable to devise anything more plausible or subtle. I am also amazed that he has the leisure to produce such a verbose refutation of an opinion which is so absurd that it would not even strike a seven year old child as plausible." AT vii. 466; CSM ii. 313. Later on, the comparison is with a three year old (AT vii. 514).

(144) AT vii. 474; CSM ii. 319. AT vii. 477; CSM ii. 321. Also: "These comments are amusing enough, if only because they would be so inappropriate if they were intended to be serious." (AT vii. 511; CSM ii. 348). "Having asked this utterly absurd question ... " (AT vii. 524; CSM ii. 356).

(145) AT vii. 492–3; CSM ii. 333. Also: "[A]s my critic here jeeringly and impertinently suggests." (AT vii. 491; CSM ii. 332). "And my critic continues to play his comic role outstandingly well when he tells the story of the peasant. But what is most laughable here is that he thinks the story applies to my words, when in fact it applies only to his own." (AT vii. 510; CSM ii. 347). Also: "There is much here that deserves to be laughed at now and for ever more, but rather than point this out I prefer to respect the actor's costume that my critic has assumed; and indeed I do not think it is right for me to spend all this time

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laughing at such ill-considered comments." (AT vii. 517; CSM ii. 350).

(146) AT vii. 525; CSM ii. 357.

(147) AT iii. 249–50.

(148) AT vii. 532; also AT vii. 469. AT vii. 504.

(149) AT vii. 457; CSM ii. 306–7. Similarly AT vii. 471.

(150) AT vii. 489–90; CSM ii. 331. Similarly AT vii. 494–5.

(151) AT vii. 527–8.

(152) AT vii. 528–9; CSM ii. 358–9; also AT vii. 529–30.

(153) AT vii. 530; CSM ii. 361.

(154) AT vii. 464; CSM ii. 312.

(155) AT vii. 578–9; CSM ii. 390–1.

(156) AT vii. 580; CSM ii. 392. See also AT vii. 581; CSM ii. 392: "Again, there is no need to fear that my opinions will disturb the peace of the Schools. On the contrary, philosophers already take sides against each other on so many controversies that they could hardly be more at war than they are now."

(157) Oct. 1637, AT i. 455–6. Compare with the *Letter to Dinet*, AT vii. 581 CSM ii. 392: "As far as theology is concerned, since one truth can never be in conflict with another, it would be impious to fear that any truths discovered in philosophy could be in conflict with the truths of faith. Indeed, I insist that there is nothing relating to religion which cannot be equally well or even better explained by means of my principles than can be done by means of those which are commonly accepted."

(158) AT vii. 3.

(159) AT vii. 464.

(160) To Mesland, 2 May 1644, AT iv. 113.

(161) AT ixb. 10–11.

(162) Oldenburg 1965–86, ii. 435.

(163) The same accusation can be found in Goudin, 1726 [1668], ii. 16, arts. 3–4.

(164) Letter to Regius, mid-Dec. 1641, AT iii. 460–2 and Letter to Dinet, AT vii. 585–6.

(165) Cousin 1856, 22.

(166) As opposed to his category of "le cartésianisme augustinisé," referring to the followers of Descartes who found it expedient to use the authority of St Augustine in order to fend off attacks by opponents of Cartesianism. Under the rubric of *le cartésianisme augustinisé* Gouhier 1978, ch. 3, discusses Clerselier, de la Forge, the pseudo Ameline, and Rohault; ch. 4 on *l'augustinisme cartésianisé* discusses Ambrosius Victor, Lamy, and Poisson.

(167) AT i. 213.

(168) Gibieuf (c.1591–1650) received his Doctor of Theology from the Sorbonne in 1611. He entered the Oratory in 1612 and became Vicaire Général in 1627, when Bérulle became a cardinal. His principal work, *De libertate Dei et creaturae*, was published in 1630. Condren (1588–1641) became a priest of the Oratory in 1614 and received a Doctor of Theology from the Sorbonne in 1615. He succeeded Bérulle as General in 1629.

(169) AT i. 16–17.

(170) AT i. 153; also AT i. 174 and 219–20.

(171) AT iii. 360 and 385–6. This did not prevent Descartes from later endorsing the Jesuit position on the matter and claiming that his view is "not very different" from that of Denis Pétau, AT iv. 115–20.

(172) AT ii. 97.

(173) AT ii. 147.

(174) AT iii. 183–4.

(175) AT iii. 237 and 239.

(176) AT iii. 184.

(177) AT iii. 419–20.

(178) AT iii. 472–3.

(179) "Il [Gibieuf] était surpris qu'il [Descartes] fût tombé dans des erreurs si grossières que de croire qu'on pût se sauver, dans la loi de grâce, sans connaître ni aimer J.-C. en toute sa vie; qu'on pût, dans le paganisme, mériter le ciel sans la grâce; et que nous fussions pas moins redevables de notre salut à notre propre volonté qu'au secours et à la miséricorde ce divin Sauveur." Charles Edme Cloyseault, as quoted in Descartes 1936, i. 448.

(180) Lallemand 1888, 120.

(181) Nicolas-Joseph Poisson, cited in Lallemand 1888, 120–1.

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(182) Girbal 1964, 30n. This edict was renewed a number of other times, with "the new philosophy" expressly referring to Descartes in 1675. See Babin 1679, 9–10.

(183) Girbal 1964, 29.

(184) Girbal 1964; Babin 1679, 35–45.

(185) D'Argentré 1726–38, ii. 345.

(186) See also the "Concordat entre les Jésuites et les Peres de l'Oratoire," and "Remarques sur le Concordat," in Bayle 1684, 1–17, 17–45.

(187) See e.g. Girbal 1964, 1988.

(188) Gouhier 1978. See also McClaughlin 1979.

(189) De la Grange (c.1641-post 1680) joined the Oratory in 1660. He taught philosophy at Montbrison and at Mans and theology at Troyes. He left the Oratory in 1680 to become curé of Chatres, near Paris.

(190) De la Grange 1682, i. 1; see also 109–35.

(191) The *Recherche* appeared in a number of later edns with significant changes, particularly an increasingly long series of "Éclaircissements" that occupied fully a third of the text by the 6th and last edn (1712).

(192) De la Grange 1682, i. 77–8.

(193) De la Grange 1682, i. 78. Cf. Malebranche, Recherche de la vérité, iii/2, chs. 6–7.

(194) De la Grange 1682, i. 83.

(195) De la Grange 1682, i. 85.

(196) De la Grange 1682, i. 1–2.

(197) De la Grange 1682, i. 2.

(198) One should recall that the 1678 congress required Oratorians to teach "6. There is no repugnancy in God's being able to produce several worlds at the same time."

(199) De la Grange 1682, i. 6–7.

(200) Ariew 1999a, ch. 8; Duhem 1913–59, ix, ch. 20.

(201) Aquinas 1952, *De caelo et mundo* I, lect. 19, sect. 197.

(202) Aquinas 1964–76, i, quaest. 47, art. 3, obj. 1.

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(203) Aquinas 1964–76, i, quaest. 47, art. 3, rep.

(204) As Pierre Duhem would have it, the tide was already turning against this approach as early as 1277. Duhem 1913–59, ix, ch. 20.

(205) De la Grange 1682, i. 7–9.

(206) Dupleix 1990 [1603], 261-2.

(207) Abra de Raconis 1651, pars 3, *Physica*, tract. 2, "De loco, ad quartum librum physicorum," quaest. 1, "An plura loca idem numero corpus capere possint, seu an idem numero corpus possit esse in pluribus locis"; quaest 2, "An duo vel plura corpora possint esse in eodem loco per penetratione."

(208) See Eustachius a Sancto Paulo 1629 [1609], *Physica*, pars 1, tract. 3, disp. 2,
quaest. 3, "An duo corpora in eodem loco, et idem corpus in duobus locis esse possit," p. 59.

(209) Aquinas 1964–76, pars 3, quaest. 75, "Quia impossibile est quod unus motus ejusdem corporis localiter moti terminetur simul diversa loca"; see also Aquinas 1934, iv, ch. 63. For Thomas' denial that two bodies can be in one place, see 1964–76, pars 3a, quaest. 83, 84; 1956, i, art. 2; 1953, iv, lect. 9 and 1915, ii, lect. 7.

(210) Scotus 1639, *Quaestiones quodlibetales*, quaest. 10, art. 2.

(211) De la Grange 1682, i. 13, titled: "Les bestes n'on point de raisonnement." One can find numerous discussions of the Cartesian definition of matter and body and repeated criticisms of the consequence that animals are machines lacking sensation and knowledge; see e.g. Claude Frassen 1668, pars 3: "Rejicitur sententia Cartesii de materiae et corporis definitione," p. 30; "Negat Cartesius dari animam sensitivam atque cognoscitivam in brutis; et asserit esse meras machinas, quae ex sola organorum dispositione, et artificiosa partium structura instar horologii moventur," p. 646.

(212) Bernard 1966. Lamy (1640–1715) taught humanities and philosophy and studied theology at various Oratorian colleges (1661–75). He was teaching philosophy in 1675 when he was expelled from Angers. In 1676 he was sent to the seminary in Grenoble and given a chair in theology. He resided in Paris from 1686 to 1689 and afterwards in Rouen, where he remained for the rest of his life. Lamy is best known for two pedagogical books, *L'art de parler* (1675), a manual of rhetoric which was often reprinted, and the *Entretiens sur les sciences* (1683), a collection of essays discussing the proper way of teaching a variety of subjects to young students.

(213) For Villecrose's theses, see Babin 1679, 38; the replies of the censor are on p. 45. Pélaut's theses with comments from the censor are on pp. 67–70.

(214) Fromentier, in Babin 1679, 36. Marginal note: p. 41.

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(216) Babin 1679, 39. Note that the 1678 Congress required the teaching of "3. That there are real and absolute accidents inhering in their subjects, that can be supernaturally without any subject."

(217) Babin 1679, 35.

(218) Babin 1679, 35.

(219) Babin 1679, 35. See [Rochon] 1672, 28. Clearly the censor had read Rochon. There are other similarities between his criticisms and those of Rochon (see pp. 56, 68, 123), but none so striking. I wish to thank Moti Feingold for suggesting I read Rochon.

(220) Babin 1679, 35.

(221) Babin 1679, 40-41.

(222) Babin 1679, 36.

(223) Babin 1679, 41.

(224) See Lamy's propositions 4 and 8 in Babin 1679, 37 (also in Girbal 1964, 156–7), with the censor's replies, propositions 1 and 5. Babin 1679, 43–5; Girbal 1964, 158–61. Note that the 1678 Congress required the teaching of "1. That actual and external extension is not the essence of matter. 2. That in each natural body there is a substantial form really distinct from matter."

(225) See Lamy's propositions 6, 7, and 11 in Babin 1679, 37 (Girbal 1964, 157–8), with the censor's replies, propositions 2, 3, 4, and 9, in Babin 1679, 43–4 (Girbal 1964, 160–2). The censor also tried to extend Lamy's rejection of qualities as distinct from substances to spiritual qualities; see the censor's proposition 10 (in Babin 1679, 44; Girbal 1964, 162), concerning Lamy's proposition 13 (Babin 1679, 37; Girbal 1964, 158). Note that the 1678 Congress required the teaching of "4. That the soul is really present and united to the whole body and to all parts of the body. 5. That thought and knowledge is not the essence of the rational soul."

(226) See Lamy's propositions 9 and 10 in Babin 1679, 37 (Girbal 1964, 157), with the censor's replies, propositions 6, 7, and 8 in Babin 1679, 44 (Girbal 1964, 161–2).

(227) Lamy 1966 [1683], 258–9.

(228) Lamy 1966 [1683], 259.

(229) Lamy 1966 [1683], 261-2.

(230) Lamy 1966 [1683], 262. Lamy also praises Descartes' mathematics and optics in other parts of the *Entretiens*: see pp. 220–3, 232–6.

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(232) Lamy 1966 [1683], 263.

(233) Lamy 1966 [1683], 80. Obviously, clear and distinct perceptions make way for clear knowledge or clear perception, in Lamy's vocabulary.

(234) Lamy 1966 [1683], 79.

(235) Lamy 1966 [1683], 87.

(236) Lamy 1966 [1683], 81.

(237) Lamy 1966 [1683], 79.

(238) Lamy 1966 [1683], 84.

(239) Lamy 1966 [1683], 85. The only role that Lamy makes for doubt is that it puts us on our toes. Lamy 1966 [1683], 86.

(240) Lamy 1966 [1683], 79.

(241) Lamy 1966 [1683], 88.

(242) Lamy 1966 [1683], 88.

(243) Lamy talks about what nature teaches us, not what our nature teaches us; he also refers to "the seeds (*les semences*) of all truths." Lamy 1966 [1683], 88.

(244) It is Descartes who said: "those who do not take the time to grasp the order and linkage of my arguments, ... will derive little benefit from reading this work." AT vii. 9–10.

(245) Bayle was a physician and, for most of his life, after 1666, a member of the Faculty of medicine at the University of Toulouse. He was associated with the Société des Lanternistes—an open forum in Toulouse for discussing ideas and reporting on new experiments. He was an active participant in the Society's meetings, teaching alongside Pierre-Sylvain Régis, Emmanuel Maignan, and others. His Cartesian sources included Régis and, through him, Robert Desgabets, and he was likewise known by such luminaries and Cartesians of the era as Malebranche.

(246) Cordemoy and Bayle 1670, 76–7. A modern edn of Bayle's *Systeme General* can be found in Lennon and Easton 1992. An anonymous reader correctly indicated that Bayle is merely translating something Descartes himself asserted in the *Sixth Set of Objections*: "Thus it is evident that when we declare that the certainty of the intellect is far greater than that if the senses, we mean merely that the judgments we make as adults as a result of new observations are more certain than those we formed in early childhood without any reflections at all." However, Bayle takes the sentence out of context and uses it in his synopsis of the *Principles*. He also does not quote the continuation, in which Descartes

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rejects the basis of the assertion as Bayle understands it: "But I cannot grant what is added here, namely, that this error is corrected by touch and not by the intellect. ... On the contrary, in addition we need to have some power of reasoning to teach us that in this matter we ought to give more credence to a judgment based on touch that to a judgment elicited from sight. Since this power of reasoning has not been in us from our infancy, it must be ascribed not to sense but to the intellect alone. And therefore in this very case it is the intellect alone that corrects an error of sense." AT vii. 439–40.

(247) Bayle called the condemnation of Cartesianism by the Oratorians "a kind of agreement (*Concordat*)" between the Oratorians and the Jesuits: "They are committing themselves to renouncing Descartes' philosophy, which they were beginning to accept. This had displeased the Jesuits very much, either because they feared that the Oratorian colleges of philosophy would attract all the young students, who find the new philosophy a hundred times more appealing than for the old, or they feared that Descartes' principles would cause a schism in religion. They obviously feared both things, but the former much more than the latter." Bayle 1684, "Avis au Lecteur."

(248) Babin 1679, "Avis au Lecteur," Journal.



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Descartes and the First Cartesians

Roger Ariew

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Summa Philosophiae Quadripartita or the Construction of the Late Scholastic Textbook

Roger Ariew

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[-] Abstract and Keywords

Descartes initially conceived the *Principles of Philosophy* as a comparison of his philosophy and that of the scholastics, intending the work to be a synopsis of his philosophy arranged in the same order as in the school curriculum, together with a summary of school philosophy; and he chose Eustachius a Sancto Paulo's *Summa Philosophiae Quadripartica* for the task—"the best book of its kind ever made," as he said. Descartes' praise for Eustachius' *Summa* seems to have been genuine. Eustachius did manage something of a feat, to have reconceptualized the whole quadripartite collegiate curriculum in one handy volume. Taking a cue from Descartes, this chapter describes the change in late Scholastic textbooks that culminates in such works as Eustachius' *Summa*, the work Descartes wanted to publish and to comment upon and those the Cartesians used as models to emulate in the construction of their textbooks.

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Keywords: Eustachius a Sancto Paulo, late Scholastic logic, late Scholastic ethics, late Scholastic physics, late Scholastic metaphysics

When, in 1640, Marin Mersenne was sending out the manuscript of Descartes' Meditations, Descartes thought himself at war with the Jesuits. He wrote to Mersenne that he would not travel that winter, since he is "expecting the objections of the Jesuits in 4 or 5 months," and believed that he "must put himself in the proper posture to await them."¹ For that reason he told Mersenne that he felt like "reading some of their philosophy-something I have not done in twenty years-in order to see whether it now seems to me better than I once thought." Thus he requested that Mersenne send him "the names of authors who have written textbooks in philosophy and who have the most following among the Jesuits, and whether there are new ones from twenty years ago." As Descartes reminisced about his Jesuit textbook authors, he said he remembered "only the Coimbrans, Toletus, and Rubius," but also requested from Mersenne "to know whether there is someone who has written a summary of all of Scholastic philosophy and who has a following, for this would spare me the time to read all their heavy tomes." Descartes recalled: "It seems to me that there was a Carthusian or a Feuillant who had accomplished this, but I do not remember his name."² We do not have Mersenne's reply, about the "Carthusian or Feuillant," but, presumably, he identified Eustachius a Sancto Paulo as the Feuillant Descartes remembered having written a summary of all of Scholastic philosophy in one volume, since in Descartes' next letter to Mersenne he wrote: "I have purchased the Philosophy of Brother Eustachius a Sancto Paulo," and added that Eustachius' Summa "seems to me to be the best book ever written on this matter."³ Descartes continued to look for other Scholastic textbooks, seeking one as excellent as Eustachius', but written by a Jesuit; in that process he read the Philosophy of Abra de Raconis (who unfortunately was not a Jesuit and whose Summa was not any better than Eustachius'). Descartes wrote to Mersenne, "I have seen the Philosophy of Mr. Raconis, but it is not as suitable for my design as that of Father Eustachius. And as for the Coimbrans, their writings are too lengthy; I would have wished wholeheartedly (p.42) that they had written as briefly as the other, since I would have preferred to have dealings with the society as a whole, instead of a particular person."⁴ Descartes also initiated another project, the precursor to the *Principles*:

My intent is to write in order a textbook of my philosophy in the form of theses, in which, without any superfluity of discourse, I will place only my conclusions, together with the true reasons from which I draw them—what I think I can do in a few words. And in the same book, I will publish an ordinary philosophy text [that is, a School text], such as perhaps that of Brother Eustachius, with my notes at the end of each question, to which I will add the various opinions of others and what one should believe about all of them, and perhaps, at the end, I will draw some comparisons between these two philosophies.⁵

Later, he informed Mersenne that he had begun the project;⁶ but it was soon aborted: "I am unhappy to hear about the death of Father Eustachius; for, although this gives me greater freedom to write my notes on his philosophy, I would nevertheless have preferred to do this with his permission, while he was still alive."⁷

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Descartes' praise for Eustachius' *Summa* seems to have been genuine. Eustachius did manage something of a feat, to have reconceptualized the whole collegiate curriculum in one handy volume. The contrast between "the heavy tomes" of the Jesuits that Descartes remembered and Eustachius' *Summa* must have been remarkable. More than six decades later, when G. W. Leibniz was writing to the Jesuit B. Des Bosses about pedagogy, he still brought up Eustachius' *Summa* as the exemplar of the philosophical textbook.⁸ Taking a cue from Descartes and Leibniz, this chapter attempts to describe the change in Scholastic textbooks that culminates in Eustachius' *Summa*—the work Descartes wanted to publish and to comment upon and that the Cartesians used as a model to emulate in the construction of their textbooks.

(p.43) 2.1. Logic in Late Scholastic Textbooks

In their logic texts, late Scholastics usually follow topics dictated by the various books of Aristotle's *Organon*; that is, they begin with the *Categories* and *On Interpretation*, and continue with the *Prior* and *Posterior Analytics*, ending up with the *Topics* and *Sophistical Refutations*. For example, after two introductory books containing some preliminary questions,⁹ Scipion Dupleix issues six other books, corresponding to Aristotle's six logical works. Dupleix's third book concerns categories; that is, substance, quantity, quality, relations, and so forth. His fourth book is about statements and their components: nouns and verbs. The fifth discusses syllogism. The sixth is about science and demonstration. Book 7 deals with topics, meaning dialectical or probabilistic arguments; and book 8 concerns fallacies. As we will see, one can say similar things about the logic textbooks of other early seventeenth-century French Scholastics (such as Eustachius a Sancto Paulo, Théophraste Bouju, René de Ceriziers, et al.). Dupleix's text, however, already exhibited some changes and development over previous logic texts.

The writing of textbooks began in earnest in the second half of the sixteenth century, reflecting some widespread pedagogical reforms. The Jesuits, following the model of the University of Paris, were in the process of reorganizing and standardizing their collegiate curriculum; textbooks, both Jesuit and non-Jesuit, reflected those changes. For example, the Jesuits of the University of Coimbra, the Conimbricenses, wrote volumes by committee, presenting the works of Aristotle that were taught in their curriculum; they patterned themselves on the model of the great commentaries, each volume treating a specific text (Physics, On the Soul, On the Heavens, etc.), but with an elaborate (post-Renaissance) scholarly apparatus, giving both Aristotle's Greek text and a new Latin translation, as well as paraphrases or commentaries (explanationes) and quaestiones the latter being the analysis of standard problems relevant to the text under discussion.¹⁰ This pattern was generally accepted by other early textbook writers, although some editions of the Coimbran tomes and commentaries such as those of the Jesuit Franciscus Toletus omitted the Greek versions of Aristotle. Still, unlike (p.44) their commentary on the *Physics* or *On the Heavens*, the Coimbrans' *Dialectics* was not a treatment of a single Aristotelian work, but a series of commentaries strung together according to the traditional order of Aristotle's Organon. But even this got modified in a number of ways.

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After six preliminary questions,¹¹ the Coimbran *Dialectics* begins in earnest with a commentary on Porphyry's *Isagoge*. It then gives the complete Latin texts of the *Categories* and *On Interpretation* with commentary and related questions, but it excerpts the *Prior Analytics*,¹² and continues with various chapters from part I of *Posterior Analytics*¹³ but omits part II completely. Finally, only the first three chapters of the *Topics* are tackled and none of the text of the *Sophistical Refutations* is provided, though a couple of related questions are discussed. In their preface "To the Reader," the Coimbrans state that they did not provide the full texts of the *Topics* and *Sophistical Refutations* in order to save their readers from an unprofitable labyrinth; they then refer them to Petrus Fonseca's *Dialectics* instead.¹⁴

Toletus' Commentary on Aristotle's Logic also begins with a commentary on Porphyry's *Isagoge* (following Toletus' six preliminary questions).¹⁵ And, after his commentary and guestions on the *Categories*, Toletus inserts the text of Gilbertus Porretanus' Six *Principles,* the latter work being a rearrangement of Aristotle's categories.¹⁶ He continues with his commentary of On Interpretation, skips the Prior Analytics entirely, and gives a complete commentary and discussion of the Posterior Analytics, including its book 2, which is neglected by the Coimbrans. Although Toletus' *Logic* is a hefty book, there is no exposition of the *Topics* or the *Sophistical Refutations*.¹⁷ Perhaps because of such apparent deficiencies, the later editions of Toletus' Logic are supplemented by the folios of Ludovicus Carbone's Additions (Additamenta). These consist of a preface with questions about the *Prior Analytics* (**p.45**) and a Treatise on Syllogism, followed by a second Treatise on the Instruments of Science; that is, definition, demonstration, topical syllogism, enthymeme, and example. The Additions end with a treatise on Precognition, or the foreknowledge required for demonstration.¹⁸ None of these *Additions* are properly commentaries on Aristotle's texts, nor do they provide the relevant original Aristotelian texts, but clearly they deal with questions discussed in connection with Aristotle's *Organon*—here primarily from the *Prior* and *Posterior Analytics*.

Ultimately, works such as Eustachius a Sancto Paulo's *Philosophy* uniformly omitted all the Aristotelian texts. Like Carbone before him, Eustachius simply arranged the *quaestiones* in the order in which the curriculum would have presented them, doing so for all the Aristotelian sciences, not simply for some particular sciences, within the frame of the whole philosophy curriculum—Logic and Ethics, Physics and Metaphysics—in a single volume.¹⁹ Dupleix's various works, collected in a large *Corpus of Philosophy*, adopted the same arrangement, though instead of being questions, the chapters were now subject matters.²⁰

Once the requirement for direct commentary is dispensed with, textbooks become more creative with their arrangement and distribution of materials, with what they **(p.46)** cover and what they emphasize. As part of larger quadripartite structures, logic textbooks then decrease in size somewhat (that is, at least in comparison with the size of the Coimbran and Toletus textbooks, even when they are published separately, as is Dupleix's *Logic* at times). Some logic texts, such as Dupleix's and Bouju's, maintain approximately the same structure as before, adding just a few new elements. As I have

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said, Dupleix gives the usual six-part treatment corresponding to the six Aristotelian books, but starts with a couple of introductory books on the status of logic and on genus, species, etc. In contrast, Bouju's *Logic or Dialectic* is arranged into five books. Book 1 is about the elements or principles of argumentation; that is, terms and statements, corresponding to both the *Categories* and *On Interpretation*. The other books follow more closely the Aristotelian arrangement: book 2, syllogism; 3, demonstration; 4, probable syllogism; and 5, sophistical syllogism. Another structural aspect of Bouju's *Philosophy* is that, like the Coimbrans, he provides Aristotel's text in both Greek and Latin, though unlike them, he does not furnish the full text but only some relevant quotations taken from all over the Aristotelian corpus.²¹

Eustachius' Summa, also unfettered with the need to stick closely to the tradition of formal commentary, break new ground. Part I of the Summa, Dialectics or Logic, is structured into a tripartite treatise about the operations of the mind. After a Preface consisting of the usual five (or six) questions on the subject and divisions of dialectics, and whether it is art or science, theoretical or practical, Eustachius discusses the first operation of the mind, which concerns "things presented to it by a kind of simple vision, without affirmation or denial"; that is, "simple apprehension." For Eustachius, in the second operation, the mind "compares these things and separates them out, and either assents to them by affirming or dissents to them by denying"; the second operation thus concerns "judgment or enunciation." Finally, in the third operation, "from the many things thus collected together the mind infers something distinct from them by a process of reasoning or argument"; the third operation is then called "discourse or argument."²² As a result, instead of giving a six-part commentary on Aristotle's six books, Eustachius rearranges the materials into a tripartite schema, with the first part, (p.47) simple apprehension, corresponding to the materials treated by the *Categories*, and the second, on judgment, being the matter treated by On Interpretation, while the third, on argument, is constituted by the materials of the *Prior* and *Posterior Analytics*, *Topics*, and Sophistical Refutations. However, although Eustachius' three parts still take on much of the standard materials in the usual order, one can say that they are transported by the schema into the realm of psychology or perhaps epistemology; they are no longer merely about terms or even about things conceived in the mind ("beings of reason," as they are for Thomas Aquinas), but about the actual operations of the understanding and their perfectibility.

René de Ceriziers follows Eustachius in the tripartite arrangement, which becomes the predominant way to think about logic. His *Logic* (part one of the *French Philosopher*) also begins with questions about the status of logic and continues with three parts concerning the three operations of the understanding; that is, a first part on simple apprehension, a second on enunciation, and a third on discourse or reasoning.²³ But not all mid-seventeenth-century logic texts adopted this exact pattern. Pierre Gautruche agreed with the general line about there being three operations of the understanding,²⁴ but divided his exposition into five parts: a preliminary disputation, then a disputation on terms, another on enunciation, a fourth on argumentation, and a fifth on the principal effects of the operations of logic; that is, scientific knowledge (*scientia*). In fact, part four

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corresponds to a general discussion of various kinds of syllogisms, including demonstrative, probable, and sophistical syllogisms, whereas part five deals with how we acquire knowledge that is certain, or what is called demonstration. Gautruche's bifurcation of reason into syllogistic or formal argument and demonstration, the latter being discourse that meets material conditions for certainty and knowledge, reflects some division about how to deal with this last operation of the understanding.²⁵

Before turning to a brief description of the contents of logic texts, we should touch upon the structure of one final text, the *Logic or Dialectics* of the Dominican Antoine Goudin, whose arrangement of questions is significantly different. He divides his exposition into a Minor Logic and a Major Logic. The Minor Logic is tripartite, **(p.48)** following the nowfamiliar three operations of the mind: apprehension, judgment, and reasoning or discourse. Thus it deals with terms, propositions, and syllogism (with an appendix on method). The Major Logic, also tripartite, is a kind of philosophical logic; it treats questions that are usually raised in conjunction with the Minor Logic. For example, part 1 starts with universals; that is, genus, species, and difference; it then proceeds through the Categories.

The Preliminary Questions

Textbooks usually begin with some standard questions about the subject or discipline to be discussed, whatever the discipline, whether it is logic, ethics, physics, or metaphysics. These questions usually treat the etymology of the term by which we call the discipline, its subject and its end, and ultimately its status as science or art, theoretical or practical endeavor. The preliminary questions often end by outlining the divisions and parts of the discipline at stake. For example, Dupleix tells us that the words "logic" and "dialectics" mean the same; they can be used indifferently for the whole discipline. He adds that often "dialectics" is reserved for only a part of logic, commonly called topics,²⁶ about probable or likely arguments, as do Aristotle and the Peripatetics. Dupleix also indicates that Plato and the Platonists use the term "dialectics" differently, for "metaphysics and supernatural philosophy."²⁷

The question about the status of logic frequently amounts to asking whether it is a "science," like philosophy; that is, like the branches of philosophy, physics and metaphysics, or not. The disciplines are divided into those dealing with contingent things, such as the arts, and those dealing with necessary things, such as the sciences. They are also divided into the theoretical—metaphysics or theology, physics, and mathematics—and practical; that is, ethics and politics. The theoretical disciplines are properly called sciences because they teach the knowledge of things by their own cause. This, of course, makes an exception of mathematics, which is called science "because of the certainty of its demonstrations, which are wholly infallible and as certain as the science acquired by the knowledge of their own cause."²⁸ Logic fits badly within these classifications. As Dupleix indicates, it does not look like a science or an art, and it is neither theoretical nor practical. It is not productive, like an art, and does not treat necessary things or make us know a thing through its cause.²⁹ There are, however, a couple of different ways to think about the arts as productive: properly and improperly speaking. As René de Ceriziers states,

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"Art, properly speaking, is a behavior that trains the agent in the production of sensible and enduring work, like Painting, which produces pictures. In this manner, Logic is not Art. One can still call Art that which directs an **(p.49)** action of which nothing sensible remains, whether the action is external, as in *singing*, which is regulated by Music, or whether the action is spiritual and immanent, as in *reasoning*; and in this sense Dialectics and Morality are arts."³⁰

In part, the question of whether logic is a science depends upon the resolution of another question, concerning the subject or formal object of logic; that is, what logic is about. The main opinion about the formal object of logic is the Thomist one, that this object is the "being of reason," which directs the three operations of the mind.³¹ In his *Commentary on Aristotle's Metaphysics*, book 4, lesson 4, Aquinas states: "there are two kinds of beings: beings of reason and real beings. The expression being of reason is applied properly to those [second] intentions which reason derives from the objects it considers, for example, the intentions of genus, species and the like, which are not found in reality but are a natural result of the consideration of reason. And this kind of being, i.e., being of reason, constitutes the proper subject of logic."³² This is the position that Goudin, as a Thomist, defends and that Dupleix disputes.

Dupleix explains the Thomist position, but calls beings of reason imaginary things—in effect, non-beings.³³ Paraphrasing Thomas, Dupleix says that we consider things in two ways: the first insofar as they are and the second insofar as we conceive them by means of our understanding. If we consider them as they are, we find in them properties and accidents; but we attribute to them different properties and accidents, if we consider them in our understanding. So, in the first case, we can consider a person and find that he or she is large or small, cold or hot. Dupleix continues:

When I consider substance, not insofar as it is, but as I conceive it, I say that it is a predicate and supreme genus, insofar as there is no other genus above it. Similarly animal is a genus because it contains several species below it. ... And in this way *predicate, genus, species, individual* are merely intellectual and conceptual beings of reason. ... Saint Thomas and his followers call things that exist in actuality *beings of things* or *first intentions and notions*; [and they call] the properties that are attributed to them by the discourse of reason and the understanding *beings of reason* or *second intentions and notions*. These, they say, are the subject of logic insofar as they guide the discourse or operations of our understanding.³⁴

(p.50) Dupleix uses the Thomist doctrine to reject logic as a science, properly speaking. He allows that one can call logic a science, improperly speaking, given that its demonstrations are certain, but, as he says, in logic there are no demonstrations of the thing by its cause. For Dupleix, as long as one considers the subject of logic a being of reason—that is, an imaginary thing—the demonstrations will be about fictive objects, not about things through their causes.³⁵ In a way, Dupleix's criticism resembles some of the Jesuit criticisms of mathematical disciplines not being sciences, not having demonstrations, abstracting from real causes, from being and the good.³⁶

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In general, however, the consensus position is that logic, like mathematics, is a science, given the certainty of its demonstrations. Dupleix calls this a science, improperly speaking, while de Ceriziers and Goudin think of it as a science, properly speaking. Goudin even defends the certainty of the demonstrations of logic against the argument that logic sometimes constructs probable syllogisms and sophisms, and that thus it is not a science. He denies that logic imparts to us the habit of consenting to probable or sophistical conclusions, though he agrees that the mind can apply rules of logic to probable or sophistical matters. This does not alter the status of logic as a science, since the rules of logic properly dispose the given matter into syllogisms.³⁷

The preliminary questions on logic therefore discuss the ambiguity in the term "dialectics" and the status of logic: is it part of philosophy or is it more like mathematics, related to but outside philosophy? Scipion Dupleix, taking a minority position in his classification of the disciplines, thinks of logic as an art, in opposition to physics and metaphysics, which he maintains as sciences (in keeping with the standard view); he gives his book on *Physics* the subtitle of Science of Natural Things, and his *Metaphysics* the subtitle of Art of Discoursing and Reasoning.

Simple Apprehension

Eustachius' first operation of the mind, or cognition elicited by the intellect, is a simple vision without affirmation or denial. It is to be contrasted with the second operation, in which the mind compares things and assents or dissents to them, and the third operation where it infers something distinct from them. The most elegant such schema has to be Claude Frassen's, whose operations of the mind are the same three described as: simple apprehension, in which the intellect attains its object without affirmation and negation; judgment, in which it does so with affirmation and negation, but without inferring something from another; and discourse, where it does so with inference.³⁸ Of course, some texts, such as those of Dupleix and Bouju, are organized more traditionally, dealing first with terms, nouns, and verbs, which are then said to be conjoined into sentences and propositions, and these ultimately into syllogisms. And there are hybrid versions, such as that of Pierre du Moulin, who defines the sorts of conceptions there (**p.51**) are in the human mind; that is, the classic three, but refers to them as single or composite: "Single Conceptions are those, which are expressed with one word, as a Horse, a Man, Whitenesse, to see, to run, etc. Composed Conceptions are those, which are expressed by an Enunciation, or proposition, that affirmeth or denieth something, as Man is reasonable. God is no lyar." Du Moulin's third category is argument: "Of many propositions joined together, is made an argument, or Syllogisme."³⁹

Eustachius divides the simple apprehension or cognition of the mind—clearly a forerunner of the Cartesian idea—into two kinds, the first confused, the second distinct:

The first involves the bare understanding of what a word means; the second involves not merely an understanding of a word but a clear and distinct conception of the nature of what is signified. The first may be said to be the apprehension of a

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word or a term, the second of a nature and essence. The former is shared by everyone who is familiar with language, including common people and peasants; the latter is found in the wise, who have explored the natures of things.⁴⁰

After this, Eustachius' discussion follows the now-established practice and discusses terms, then universals (in the fashion of Porphyry), and then categories, separating the discussion of the first four categories from the last six (in the fashion of Gilbertus Porretanus). In Eustachius' discussion of the categories, we also encounter the doctrine of the grades or degrees of being, with substance having more being than accidents and the accidents of quality and quantity having more being than other accidents:

It should be noted that these ten supreme kinds, though they are true and real, are not called entities in the same way, since they do not have an equal share in being: some are more properly said to be entities than others. For example, a substance is said to be more properly an entity than any accident, since no natural power can enable accidents to exist unless they inhere in or belong to a substance. Or again, among accidents, quantity and quality have more right to be considered entities than the remaining categories, which generally follow from them. For example, relations arise partly from quantity and partly from quality; action and passion arise from active and passive powers, which are qualities, and so on.⁴¹

Not all textbook writers felt the need to discuss universals or categories. Bouju limited himself to a few comments on terms of first and second intention (the latter being terms about terms), nouns and verbs, then some chapters on kinds of nouns-finite and infinite, common and singular, univocal or synonymous, equivocal or homonymous, analogous, concrete, or connotative, and abstract-before moving on to statements and propositions. To these, de Ceriziers added categorematic versus syncategorematic, transcendental, and absolute versus connotative terms, as did Eustachius.⁴² Categorematic terms, according to de Ceriziers, are "significative and place things in the categories." Syncategorematics "restrict the signification of other terms, as do these three: All, None, Some." Transcendental terms do not have a place in any category, as (**p.52**) for example *Being*, *Thing*, etc.⁴³ But for those discussing such universals, the traditional problem of universals, whether there are universal natures, was a remaining locus of great controversy. Platonist and nominalist answers—for the former, that there are universal Forms or Ideas separate from things, and for the latter, that only words and not things are universal-were usually trotted out merely to be dismissed. Taken seriously as matters of debate were the Thomist and Scotist positions—respectively, that universals are only in the intellect and not in things, and universals are natures that are not really but formally distinct from the individual. For a Thomist, Peter is considered as separate from Paul but our intellect considers them as one, as having a common human nature. The Scotist replies that the nature of Peter is not really, but formally distinct from Peter, and even if Peter is distinct from Paul, there is a formality in Peter, namely human nature, which is not formally distinct from the nature of Paul.⁴⁴ Frassen supports the Scotist position.⁴⁵ Goudin and de Ceriziers deny it and affirm the Thomist position; de Ceriziers states: "[Universals] are distinguished only by our reason, which considers

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things without their individual conditions. From this we must conclude, against Scotus, that universals are a work of the mind not found in nature except after the action of the understanding. ... This is the doctrine of Aristotle and Saint Thomas."⁴⁶

Judgment

Judgment is the second operation of the mind, requiring the composition of the cognized simple elements (names and verbs) into propositions (statements or enunciations). Textbooks begin their discussion, at times, with what they call imperfect propositions, composed of subject and predicate but without the linkage provided by the copula, such as All powerful God or Peter the Apostle. Perfect propositions assert or deny the predicate of the subject, as in *God is all powerful* or *Peter is the Apostle*.⁴⁷ These again are the materials covered in Aristotle's On Interpretation. Textbooks generally follow Aristotle but in abbreviated fashion: they discuss kinds of propositions (universal, particular, indefinite, affirmative, negative), propositions modified (that is, modal, conditional, and disjunctive), and oppositions between propositions (depicting the square of oppositions, involving contraries, contradictories, and subordinates), ending up with the conversion of propositions into one another. For example, universal affirmative enunciations are said to be contradictory to particular negative enunciations: "every man is white" is given as contradictory to "some man (**p.53**) is not white."⁴⁸ This leads to a discussion of the conversion or equipollence of enuciations: "no man is a horse" can be converted into "no horse is a man."⁴⁹ Some textbooks continue the discussion with the treatment of modal propositions, their contraries, contradictories, subalternates, and equipollence. Eustachius limits himself to a handy one-page diagram.⁵⁰ Dupleix treats the matter in a single small chapter, and recalls a mnemonic devise encapsulating modal conversions; he continues with another small chapter on hypothetical, conjoined, and disjoined enunciations.⁵¹ Bouju has an extended discussion of modal equipollence and conversion—as for example: "it is necessary that Socrates be rational" is said to be equipollent to "it is not possible for Socrates not to be rational" and "it is impossible for Socrates not to be rational."⁵²

Aristotle's *On Interpretation* also famously discusses future contingents, but all textbooks dispense with this discussion, except for those of the Coimbrans and Toletus,⁵³ which are generally obliged to talk about them because of their commentary format. Another exception is the *Logic* of Goudin, whose arrangement of Minor/Major Logic allows him to devote an article to the topic, under the rubric of Major (or philosophical) Logic.⁵⁴

Since judgment involves affirmation and denial, textbook authors are at times called to talk about truth and falsity. Eustachius produces this definition of it:

truth is properly defined as conformity of the knowing intellect with that which is known. This conformity is a relation of assimilation or adequacy of the intellect to the thing which is understood; and falsity is a deviation of our intellect from the truth of the thing known. Thus, propositions are said to be true or false not because they do or do not conform to our cognitions, but because they do or do not conform to the thing known.⁵⁵

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Eustachius also inserts a short treatise on method as part of his discussion of the second operation of the mind, before his discussion of the third operation, discourse, encompassing both syllogism and demonstration. He speaks generally of method and its divisions, prudential and dialectical, general and particular. For Eustachius, there is an order to the method of any science, which is that "what is prior must be expounded earlier, and what is posterior, and incapable of being understood without what has gone before, should be explained later."⁵⁶ He also touches on analysis and synthesis; **(p.54)** that is, the order of resolution or division and composition or integration, each in four parts. Eustachius' analysis is, however, concerned with such things as the resolution of a whole into its single members or conclusion into its principles. Similar but converse things can be said about his notion of synthesis.⁵⁷

In contrast with Eustachius' exposition, method is not usually discussed in conjunction with judgment, but with argument and discourse, if it is discussed at all. In fact, authors as diverse as Frassen and Goudin argue that method should not be distinguished from the third part of logic as a fourth part unto itself. As a result, discussions of analysis and synthesis, or aspects of order in science, are often located in the third part of logic, with argument, discourse, syllogism, and demonstration. For example, Dupleix has a chapter on analysis and synthesis at the start of his book 6 on demonstration. But his notions of analysis and synthesis, like those of Eustachius, are not concerned with ordering propositions in the search for truth, but about the dissolution (or composition) of a thing to (or from) its principles:

Analytic (in the same way as *resolutive* in French) ... is nothing more than a regress or return of a thing to its principles and (to speak more clearly) a dissolution of the pieces of which a thing is composed—so that it is the contrary of composition. For example, throw a bush into the fire: what will be fire in it will be turned into fire; air will be exhaled; water will be evaporated; but if the wood is green, the air and water will mix and a kind of foam will come out of the pores; the terrestrial will be resolved into ashes. And through this resolution we will judge that this wood was composed of the four elements.⁵⁸

Goudin similarly adds an appendix on method to the third part of his Minor Logic, just after his discussion of syllogism. However, he thinks of analysis and synthesis as two ways of proceeding in the search for truth, by invention or discovery and by doctrine or teaching: "By invention, when one seeks the truth with only the resources of one's mind; by doctrine, when one delivers to others the truth one has discovered."⁵⁹ Still, he is able to encompass the notions held by Eustachius and Dupleix:

The analytic method is the way of proceeding with order in the invention of truth. We call it analytic or resolutive because it resolves questions into their principles, effects into their causes, composites into their parts. ... Synthesis proceeds in the opposite way from analysis, that is, from principles to conclusions, from causes to effects, from parts to whole. ... The analytic method climbs from things to the principles of things. The synthetic method descends from principles already discovered to things one wishes to explain.⁶⁰

Goudin continues with four general rules of method (together with three rules for analysis and five for composition).⁶¹ The first general rule of method for Goudin is to begin always with the easiest, most known, and most proximate things and proceed **(p.55)** from there a little at a time and by degrees toward the most difficult, obscure, and remote. His second rule is to make use of the natural order of things and adapt to it any artificial order to the extent possible. The third concerns knowing things in all their parts and attributes, organizing them by a fictitious order, if one cannot recognize a natural one. The justification indicates that one knows things more easily if they are ordered and linked among themselves, when there are too many things to know. The fourth rule is to cut out useless or extraneous things in the pursuit of one's goal.⁶²

Reasoning

We should consider briefly the third operation of the mind, namely discourse or argument. This again covers the materials of four distinct Aristotelian books: *Prior Analytics*, about syllogism, *Posterior Analytics*, about scientific demonstration, *Topics*, about probable argument, and *Sophistical Refutations*, about fallacies.

A syllogism is a deductive argument constructed out of two premises and a conclusion, all enunciations, each composed of a subject and predicate linked together by a copula. Du Moulin explains the subject-predicate linkage using a Venn-diagram-like illustration of three rings (trying to get transitivity across): "If the ring A, be joined with the ring B, and the ring B, with the ring C, it followes that the ring A, is joined with the ring C. This also is made plaine by the example of numbers, in arguing thus: XII. *containes* VI. and VI. *containes* III. Therefore XII. *containes* III. For we have said that in Mathematicks to *containe*, is the same, as in Logicke to *be attributed*."⁶³ Du Moulin's discussion continues in the standard fashion by defining the figure and mode of a syllogism.⁶⁴ Like other logicians, Du Moulin proceeds next to give rules for determining a syllogism's validity, which are then encapsulated in the standard mnemonic verses of girls' names.⁶⁵

(**p.56**) At this juncture in Schools books, there is usually a transition from the notions of syllogism to those of demonstration; that is, from what is discussed in the *Prior Analytics* to what is discussed in the *Posterior Analytics*. Bouju's transition is particularly interesting. He thinks of syllogism as "formal conditions for inference" and demonstration as "material conditions for inference." According to Bouju, the syllogism considered formally is perfect as long as it is constructed according to the proper mode and figure; that is, according to its form. In that way, we can say the syllogism is valid without having regard to the truth or falsity of its premises and conclusion. But demonstration requires more: it requires the consideration of the material conditions of the premises, their truth or falsity, necessity or contingency. Syllogism considered according to its material conditions is thus divided into probable or demonstrative. According to Bouju, then, demonstrative syllogism or demonstration is a syllogism that deduces its conclusion from propositions that are true, first or immediate, necessary, prior to, and better known than the conclusion, and cause of its knowledge.⁶⁶

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These conditions are, of course, the conditions for demonstration or scientific knowledge, as stated in Aristotle's *Posterior Analytics*. As Eustachius states: "principles of *demonstration* refers the assumptions or premises from which a necessary conclusion is deduced.... In the course of the *Posterior Analytics*, Aristotle mentions eight conditions that such principles must meet, namely ... that the principles must be true, immediate, better known, prior to and causes of the conclusion, necessary, appropriate, and eternal."⁶⁷ Dupleix does the same: "through the use of demonstration, whose [purpose] is to produce science, one must supply principles (which are the matter of the science) that are true, proximate and immediate, primary, more known, and causes of the conclusion, without which conditions and qualities the demonstration will be defective and imperfect."⁶⁸ In unfolding those conditions, we also rejoin the other definition of science as the eternal and universal knowledge of the proximate cause of the thing, and achieve the contrast between science and opinion, knowledge received from the intellect and that received from the senses: "true science consists in knowing things by their proper cause, something ordinarily hidden and unknown to us.... Most of what we claim to know lies in an indifferent and often deceptive opinion and belief, which we take from various accidents, rather than in a certain knowledge of things by means of their proper and proximate cause."⁶⁹ By explicating "more known," Dupleix (**p.57**) derives what is desired: "we must understand that things are said to be more known than one another according to nature or according to us. It is certain that, according to nature, universal and more common things are most known, that is, first in the order of nature.... According to us or with respect to us, things are more known either by means of our intellect or by means of our external senses. The intellect has the universal things and the senses the singular things as object."⁷⁰

There is not much to be said about the late Scholastics' treatment of probable syllogism and fallacies. Most do short work of these. For instance, Eustachius devotes a single brief disputation to each of these, and Goudin barely mentions them at all.⁷¹ Others, such as Du Moulin, Dupleix, and Bouju, do give these subjects more consideration, spending two books on them. Du Moulin treats The Places of Invention out of order, in book 2, before Enunciation, Syllogism, and Demonstration, ending his tome with book 6, Fallacies; in fact, Du Moulin's book 2 is more than twice the size of his other books, and, together with Fallacies, constitutes more than half of the whole work. Bouju and Dupleix also devote a fair amount of their logic to these subjects, with proportionately more discussion of fallacies. I suppose that one can say the same thing about contemporary logic texts; some do devote a fair proportion of their volumes to discussing reasoning and informal fallacies instead of formal matters. It is amusing to realize how little these discussions have changed in the last four centuries. Bouju discusses and gives examples of fallacies of equivocation, composition, division, *ignoratio elenchi, post hoc, ergo propter hoc*, multiple questions, affirming the consequent, *petitio principii*, etc.

2.2. Ethics in Late Scholastic Textbooks

With logic (as it will be with physics), the problem faced by textbook authors was that of making sense of different works of Aristotle as a single treatise, unified according to a new schema. With ethics (as with metaphysics), the task is somewhat different. Although some

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textbook authors envision their projects as making sense of a number of Aristotelian works, they are relatively few in number. An example of this kind would be Pierre Barbay, in his Commentary on Aristotle's Morals, which is divided into three books, the first, a major treatise on Generic or Monastic Morals, the second, a shorter work on Oeconomics, and the third, also short, on Politics. This is not an unexpected configuration of the Aristotelian moral and political works. Théophraste Bouju also discusses these three subject matters in his Philosophy, keeping them distinct from one another, but loosely grouping them together as philosophical subjects "that belong to prudence," as contrasted with those "that belong to wisdom," namely (**p.58**) logic, physics, and metaphysics.⁷² Neither Barbay nor Bouju seem to have felt the need to reconceptualize the materials into a single unified plan. They, like the other textbook authors, propose to produce treatises on ethics based primarily on Aristotle's Nicomachean Ethics. The textbook authors do know of other Aristotelian ethical works, such as the Magna *Moralia*,⁷³ but the *Nicomachean Ethics* is still the work at the center of their discussions. However, producing a treatise on the ten books of the Nicomachean Ethics results in almost the same problem as before, in that the ten books do not themselves seem sufficiently unified. Thus the task of producing an ethics becomes the one of reconceptualizing the materials of the ten books of the Nicomachean Ethics into a single unified treatise. This happens almost from the start with early modern textbooks on morals. Although there are a number of direct commentaries on the Nicomachean Ethics written during the sixteenth and seventeenth centuries,⁷⁴ even the Conimbrans do not attempt to write their ethics in the form of a commentary; instead, they collect Disputations on the main issues associated with Aristotle's books of the Nicomachean *Ethics,* which they arrange according to a new, reordered schema.

A superficial glance at the basic structure of the ten books of the Nicomachean Ethics as it has come to us confirms the sense of disunity: (1) The Good for Man. Happiness; (2) Moral Virtue in General; (3) The Voluntary and Involuntary. Fortitude and Temperance; (4) Other Moral Virtues; (5) Justice; (6) Intellectual Virtues; (7) Continence and Incontinence; (8) Friendship; (9) Properties of Friendship; (10) Pleasure. Happiness. Even at this very general level we can ask about the two apparently disparate topics collected in book 3, on the principles of human action, such as voluntariness and involuntariness, and on the virtues of fortitude and temperance. Or we can wonder about the relationship between the two books on friendship (8 and 9) with the book that precedes them on continence and incontinence (7) and the one that follows on pleasure and happiness (10). And we can ask about the doubling of the discussion of happiness in books 1 and 10. One can sense Thomas Aquinas' difficulty in trying to put these materials into some order as he considers them in his Commentary on Aristotle's Ethics. Aquinas faithfully preserves Aristotle's arrangement in his *Commentary* and does not reorder the Ethics. After laying out some preliminary materials, he manages to conceive of the ten books of the *Ethics* along a tripartite model, which he believes is derived from Aristotle himself: (i) Happiness; (ii) The Virtues; and (iii) The End of Virtue.⁷⁵ Aguinas also thinks that the second part, on the virtues, is further (**p.59**) divided into three parts, (1) Introductory questions (parts of the soul); (2) The virtues themselves;⁷⁶ that is, moral virtues concerned with the internal passions (fortitude, temperance, liberality,

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magnanimity, veracity),⁷⁷ moral virtues concerned with external operations (justice), and intellectual virtues (wisdom, prudence, science); and (3) Things that follow from and particular effects of the virtues;⁷⁸ namely, continence and incontinence and friendship (in regard to man himself, that is pleasure and happiness, and in regard to the common good and the good of the whole state). But when Aquinas writes the corresponding passages in his *Summa Theologiae* in his own voice (in the first and second parts of part 2), he reconceives the schema entirely.

It has been said that Scholastic textbook authors took Aquinas' Summa as the model for the organization of their own textbooks.⁷⁹ But it is difficult to see this. For one, Aguinas is writing a *Summa of Theology*, where the questions of happiness and the virtues are extended beyond the natural to the supernatural; and this is not always the perspective of Scholastic textbooks writing about ethics for the philosophy curriculum. For Aquinas, "Happiness is twofold; the one is imperfect and is had in this life; the other is perfect, consisting in the vision of God."⁸⁰ Similarly, for Aquinas, since man's happiness is dual—in one of its aspects proportionate to human nature, something that can be obtained by means of natural principles, and in its other aspect surpassing man's nature, something that can be obtained by the power of God alone—virtues also have to be dual. As he states: "it is necessary for man to receive from God some additional principles, whereby he may be directed to supernatural happiness. ... Principles of that kind are called 'theological virtues.'" Aquinas' theological virtues—faith, hope, and charity—are "infused in us by God alone"; they are not made known to us, "except by Divine revelation, contained in Holy Scriptures"; and they are "specifically distinct from the moral and intellectual virtues."⁸¹ Apart from these supernatural considerations that are not always integral to the Scholastic ethics textbooks, Aquinas' discussion covers in great detail other topics that the textbooks do not usually cover; in his exposition, Aquinas includes a treatise on habits and another on law, before concluding with one concerning acts that especially pertain to humans, such as prophesy and miracles. The overall (**p.60**) structure of Aquinas' Summa is considerably different from the schema that was to be adopted in the early modern textbooks.

But perhaps what is meant by the "Thomistic" influence on Scholastic ethics relates primarily to the doctrine of the four cardinal virtues: prudence, justice, fortitude, and temperance. This is an old classification Aquinas receives from St Ambrose; he quotes the latter as saying: "We know that there are four cardinal virtues, namely, temperance, justice, prudence, and fortitude." But Aquinas also thinks of the four virtues as Platonic in origin; he cites Macrobius asserting: "Plotinus, together with Plato, foremost among teachers of philosophy, says: 'The four kinds of virtue are fourfold.'"⁸² Clearly, the fourpart schema does not fit very well with Aristotle's both broader and looser classification of the virtues, especially given that, for Aristotle, prudence is an intellectual virtue and that thus it would be discussed separately from the others in his exposition. Prudence also appears to be more than one of the virtues in that it seems to accompany all virtues. However, Aquinas accepts the four-part schema and devotes his antepenultimate treatise to prudence and justice (qq. 47–122) and his penultimate treatise to fortitude and temperance (qq. 123–170). It is this characteristic—that is, the doctrine of the four

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cardinal virtues and the act of concluding (or nearly so) one's treatise with sections on prudence, justice, fortitude, and temperance—that causes one's treatise to look Thomistic. So, within this fairly limited perspective, one can call the new seventeenthcentury Scholastic schema for ethics a Thomistic one based on the *Summa Theologiae*.

The textbook of the Jesuits of Coimbra, Disputations on Aristotle's Nicomachean Ethics, follows this "Thomistic" pattern. It consists of nine books of disputations on: (1) the good; (2) the end; (3) happiness; (4) will, intellect, and appetite; (5) the good and evil of human actions; (6) the passions; (7) virtues in general; (8) prudence; and (9) justice, fortitude, and temperance. A similar pattern and even order of topics can be seen in the textbooks of many authors, such as Eustachius a Sancto Paulo, Pierre Gautruche, Antoine Goudin, and, to a lesser extent, René de Ceriziers and Barbay. For example, Eustachius follows the Coimbran pattern, but conceives it in a tripartite fashion. After the preliminary questions, the first part of Eustachius' Morals, titled On Happiness, is itself divided into three parts: on the good, the end, and happiness itself (corresponding to the Coimbran parts 1–3). Part 2 concerns the Principles of Human Actions and discusses in succession: internal principles of human action, such as will and appetite; acquired principles, such as habit; and external principles, including God and Angels (corresponding to the Coimbran parts 4–5). Eustachius' third part is about Human Actions themselves; that is, Passions, Virtues, and Vices; it is further divided into several disputations and questions: concerning the good and evil of human actions; passions, such as love and hate; the virtues in general; prudence; justice; fortitude; and temperance; ending with a short disputation on vice and sin (corresponding to the Coimbran parts 6–9).⁸³

(**p.61**) De Ceriziers also follows the same general model,⁸⁴ except that he insists that one should discuss ends before means, and, in this case, the end of human actions before the means that lead us to them. This yields two parts with the second part being further divided. De Ceriziers asserts, "Since moral philosophy has no other end than to lead the will in its operations and the will never acts without the understanding illuminating it, I think it is necessary to treat all of the virtues of this master faculty ... so that the first part of my Morals will concern the virtues of the understanding; and because the knowledge of ends precedes the choice of the means, the second part will be to show the nature of the supreme good, in which man's end truly resides."⁸⁵ Thus, de Ceriziers begins with a book on the intellectual virtues: wisdom, intelligence of first principles, knowledge (*science*), art, and prudence. But he continues with the now established pattern: the nature of the supreme good, internal principles of human actions, external principles of human actions, virtues (involving the passions), still ending with the four cardinal virtues —prudence, justice, fortitude, and temperance (thereby also doubling the discussion of prudence).

Scipion Dupleix and Bouju do not follow these models. They simplify their schemas, discussing the supreme good and then giving multiple chapters on the virtues.⁸⁶ We do not need to detail these here, but will consider the peculiarities of their doctrines as **(p.62)** needed. Let us finish this brief survey of the structure of seventeenth-century Scholastic textbooks on ethics with the one given by Pierre du Moulin, whose

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arrangement of topics is unusual.⁸⁷ Du Moulin organizes his *Elements of Moral Philosophy* into two parts. After an introduction, part 1 is concerned with happiness, or the end of human life. Part 2, the bulk of the text, is itself divided into four subparts: 2.1, on the means for attaining happiness (virtue in general); 2.2, on the species of moral virtue: temperance, courage, and justice; 2.3, on the communication of virtue, or friendship; and 2.4, on the intellectual virtues: wisdom, science, prudence. Du Moulin is decidedly not following the "Thomistic" pattern. In fact, he raises the issue of the four cardinal virtues, which he attributes to Cicero and "others after him," and makes the point, consistent with Aristotle, that prudence is an intellectual, not moral virtue: "they therefore act in the same way as someone listing the virtue of the squire among the virtues of the horse." Thus, for Du Moulin, there are only "three cardinal or principal virtues, temperance, fortitude, and justice."⁸⁸

The Preliminary Questions

Unlike the preliminary questions on logic, textbook authors usually make short work of the preliminary questions on ethics. Perhaps this is because they have mostly settled the standard questions: what is ethics, its subject or object, its end, and its division or order. (I have, of course, just discussed their various views on the divisions and order of ethics in the previous section.) The only outliers to this claim are Dupleix, who allocates a whole book to the preliminary questions, and Du Moulin, who skips the usual preliminary questions and devotes his introduction to the soul, its faculties and passions (sensitive faculty, appetite, intellect, will, and perturbations or affections of the soul).⁸⁹

The textbook writers mostly agree that ethics or morals is not properly an art, but a genuine science. In this way of thinking, the question about whether ethics is the same as prudence is usually raised, and answered negatively. Goudin identifies the view with "Epicurus and several other philosophers." The argument, which he claims to derive from Aquinas,⁹⁰ is that principles of prudence are not universal but particular (**p.63**) principles, allowing us to determine what to do in a specific situation. So a person can know the principles of morals and what is good or bad in general, but still choose what is bad in a particular case: we do not always act according to what we know, but may be corrupted by our passions or vice. The principles of prudence and morals being different, Goudin concludes (with others) that prudence and morals are different. But he also considers how to respond to someone who says that prudence would consist in the right or healthy perception of what one should do, that it is an intellectual virtue regulating reason with respect to things to be done, and would thus be indistinguishable from morals. Even then Goudin demurs; he agrees that prudence would in this case be the right perception of what one should *actually* do, the right advice about a particular act, but it would not be so in a *general and abstract sense*, when considering speculatively what is just and honest.⁹¹

Thus Goudin's conclusion, like that of the others, is that ethics is a science. He even says that ethics is subalternated to physics, meaning that it bases its conclusions on the principles of physics, which are certain. As with all subalternate sciences, the object of subalternated science (ethics, in this case) is defined by the addition of some difference

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to the object of the science to which it is subalternated (physics, in this case), and with which it shares a genus. According to Goudin, the difference between ethics and physics is that the object of physics is vital motions and human affections insofar as they proceed from a living soul, while ethics studies those same affections insofar as they can be declared good or bad from the point of view of reason.⁹²

There is, in addition, a general consensus among the textbook writers that ethics is a practical science, as opposed to a theoretical science. By this they mean that the aim of ethics is activity, as opposed to contemplation. But they also seem to agree that all sciences, whether active or contemplative, aim at the same thing, namely happiness. Eustachius puts this very well:

The end of all philosophy is human happiness, for in the eyes of the ancients nothing was a greater spur to philosophizing that the aim of becoming more blessed than other men. This happiness was taken to consist partly in the contemplation of the truth, and partly in action in accordance with virtue. Hence in addition to the contemplative sciences there must be some science that provides an account of what is right and honorable, and instructs us in virtue and moral probity. This science is called ethics, that is, moral learning, or the science of morals, and is traditionally reckoned as one of the chief parts of philosophy.⁹³

Dupleix also agrees with such sentiments. According to him, "Morals is a [branch of] Philosophy that teaches us to regulate our actions by our reason." He specifies that the genus of ethics or morals is philosophy, "insofar as Philosophy in general is divided into theoretical and practical, that is, into contemplative and active. The latter is **(p.64)** nothing other than morals; the former includes all the sciences that have knowledge and not action as goal, such as Metaphysics, Physics, and Mathematics." His definition serves to distinguish morals both from the contemplative sciences and the "illiberal" or professional arts: "of the latter because they do not teach one to regulate mores, but only give some precepts and some rules of the professions; of the former because they do not consist in action, but only in contemplation."⁹⁴ But this is where Dupleix's agreement with the other textbook writers ends. The remainder of his definition refers to the object of morals, and while there is near unanimity for a Thomist position among the other writers, Dupleix disputes the position. He gives several candidates for this, which he criticizes, including the Thomist one.

According to Dupleix, Averroes holds that the subject or object of ethics is "the governance of the city" and Marsilio Ficino, whom Dupleix calls a "great supporter of Platonist Philosophy," does not diverge from this, saying that it is "the city itself." Aquinas writes that it is "the action of man ordered or regulated to some end" or else that it is "man himself insofar as he acts toward some end." Thomists say that it is "man insofar as he is capable of happiness or beatitude." Still others state that it is "the happy life or the supreme good of the active life." Finally, Francesco Piccolomini—"a great Peripatetic" though "too skeptical," as Dupleix says—asserts that it consists in "human actions insofar as they can be composed and regulated with respect to honesty and propriety."⁹⁵

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community of any kind, moral philosophy would continue to regulate the governance of families or the actions of particular persons. The governance of the city concerns politics, a part of morals, but it is not the universal subject of the whole thing. Dupleix is looking for the object of the part of morals called *monastic*, about the governance of particular people, as opposed to either politics or *oeconomics*, about the governance of the family.

Dupleix's criticism of Aquinas is that he does not specify the end to which human actions are regulated (namely, honesty and propriety). And the alternative subject given by Aquinas and the Thomists misses the mark, according to Dupleix, because man himself, who is the subject of physics, cannot be the subject of morals. Dupleix speculates that Aquinas and the Thomists may have been led astray by an analogy between medicine and morals: as medicine has as its object man, who can be cured from the illnesses of the body, morals would have as its object man, who can be cured by the illnesses of the soul. He thinks of this as a bad analogy, since medicine proposes to cure the human body, not the whole man, and morals proposes to cure neither the man nor his soul, but only his actions, "so as to get them to conform with honesty and decency." Finally, those who think that the happy life or the supreme good of the **(p.65)** active life is the subject of morals confuse the subject and the end of the discipline. Surprisingly, perhaps, Dupleix gives Piccolomini's answer as the true object of morals: "human actions insofar as they can be regulated and composed with respect to honesty and propriety."⁹⁶

Dupleix's disagreement with Aquinas is not enormous. Still, it is important to note that he and some of the other textbook authors clearly wish to call attention to their disagreements with the Thomists.⁹⁷ Dupleix might criticize Aquinas and the Thomists more frequently in his Physics and Metaphysics, but, as we have just seen, he does not fail to note some of his disagreements with them even in Ethics. Dupleix also criticizes, or rather dismisses, many other philosophers. As with Dupleix's dismissal of Ficino and the Platonist position on the object of ethics or as with Goudin's rejection of the Epicurean position on prudence, when textbook writers bring up non-Aristotelian doctrines, such as Platonist, Stoic, or Epicurean ones, it is usually not to take them seriously as live philosophical options, but just to catalog the positions and to reject them out of hand. We can see this as well with respect to the Platonist, Stoic, and Epicurean views of happiness, virtue, etc.⁹⁸

Happiness

De Ceriziers begins his chapter on the supreme good by asserting "Everyone desires beatitude in this life; no one possesses it."⁹⁹ He defines the supreme good as something in our power, something we can acquire with the force of our own nature, and not just what is supernaturally graced. He then proceeds to detail man's unhappiness in this life—man being the only animal who feels, imagines, and remembers his own misery—and ends by referring to Varro, who counted 288 different opinions concerning felicity. Still, de Ceriziers thinks that these things only prove that men are not happy, not that they cannot become happy. De Ceriziers argues that if beatitude were impossible for man, "God and Nature (who do nothing superfluous) would be giving man this desire in vain. Why would man be the only intelligent being, if he cannot be content?"¹⁰⁰ His response is that

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subjects that are capable of receiving a particular accident are capable of receiving its contrary: whoever suffers heat, suffers cold; that which can be black can be white. Men who can be miserable in this life by being full of vice can possess the felicity **(p.66)** which is opposite to misery and vice; we can be happy and virtuous because we can be miserable and full of vice. However, de Ceriziers continues, happiness does not consist in accidents, riches, and honors; it does not reside in the goods of the body or in the habits of virtue in which the Stoics think it consists.

Before giving his own opinion on the subject, de Ceriziers formulates a distinction and lays out some conditions. Happiness is dual: objective and formal; objective happiness is the good enjoyed by the blessed and formal happiness the enjoyment of the blessed. He then states: "Man has his ultimate and perfect felicity only in heaven, though there is something of it on earth that corresponds to this supreme good that we await as the ultimate end of our desires and which we cannot possess without being happy."¹⁰¹ The conditions for this happiness (that corresponds to the supreme good in heaven) are fivefold: the good that serves as the object of our happiness must be most good, most perfect, most beautiful, most sufficient, and most delectable. Having considered these conditions, de Ceriziers concludes that the only possible object of felicity for man is God; he alone satisfies the five conditions. Hence he also concludes that formal human felicity is a most perfect operation of the principal human faculty (this is allegedly in agreement with Aristotle); the question left to be resolved is whether this action belongs to the faculty of understanding, as Aquinas thinks, or that of the will, as Duns Scotus believes (another possibility, which de Ceriziers attributes to Bonaventure, is that felicity requires both understanding and will). De Ceriziers' answer to this final question is dual, depending upon whether one is speaking about our future life in heaven or our present life herebelow. In heaven one cannot perceive God without loving him or love him without perceiving him; nonetheless de Ceriziers argues that the essence of supernatural felicity consists in the action of the understanding, the noblest of our faculties—and in that way he believes that he comes to agree with Aristotle, Plato, and biblical prophecy. In contrast, de Ceriziers places the felicity for our present life in the love of the supreme being, meaning in our faculty of will, though he admits that something would be missing from our felicity here-below if we were to love God without tasting the sweetness of the divine object. De Ceriziers summarizes his thoughts by asserting "eternal beatitude consists in the knowledge of God and temporal beatitude in his love."¹⁰²

Bouju follows the same kind of argumentative path as that traced by de Ceriziers, but comes to radically different conclusions. Like de Ceriziers, he argues that God and nature do not operate in vain and would be doing so if everyone sought for an illusory **(p.67)** felicity they could never attain. He also attributes to Aquinas the argument, of which he approves, that human nature cannot be deceived at all times—as, for example, if it were to believe that felicity is a true being, if there is no such thing. A false opinion is only an infirmity of the understanding, and since defects are accidents, they cannot be in us universally and always; thus a judgment held always and by everyone cannot be false.¹⁰³ Like de Ceriziers as well, Bouju lists conditions for the human happiness we can have in this life (as understood through our "natural light"), though he lists eight

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somewhat different conditions than de Ceriziers' five: it is a good; it is pleasurable and brings the greatest joy; it is something within our power; it can be gotten easily; it is the most desirable of all human goods; it is sufficient, perfect, and desirable in itself, not for something else; it brings tranquility; and it is the ultimate end of all human actions, though not something fleeting, but for the long run.¹⁰⁴ Given these conditions, it becomes clear that happiness does not consist in external goods, such as riches, power and worldly authority, the favor of eminent people, good fortune, the goods of the body, such as pleasure, health, and beauty, the goods of the mind, such as contentment and pleasure, the affection of the person loved, amusement and diversion, honor, praise and glory, or even the habit of virtue.¹⁰⁵ According to Bouju, human felicity consists in activity of the soul in accordance with the virtues of perfect wisdom and prudence. This alone, he argues, fits his conditions: wisdom and prudence are goods of the noblest part of our souls; are accompanied by pleasure and contentment; in our power; easy to exercise; the most excellent good for man; the only sufficient, perfect, accomplished goods; cause in us tranquility and rest; and are such that the ultimate end or perfection of man consists in their activity.¹⁰⁶ Bouju ties up some loose ends by discussing Solon's pronouncement that one should not count any mortal happy until he is dead; he also deals with the kinds of external and bodily goods that do belong to felicity¹⁰⁷ and the thought that it is an honest, delectable, and useful good. Thus, Bouju rejoins Aristotle as much as possible. He concludes his first book on happiness by describing the three kinds of lives that men can lead: the contemplative life in the exercise of wisdom, the civic life in which one comports oneself according to prudence and the moral virtues, and the life of sensual pleasures, of excess and unregulated passions. The first two lives can be called happy, but the third, of course, is proper only to the beasts and brutes and is unworthy of man.¹⁰⁸

(**p.68**) The same pattern of argument, though not the same conclusion, is repeated by the other textbook writers. In most ways, Dupleix is closest to Bouju. He starts his book on the supreme good with the diversity of opinions concerning the subject, referring also to Varro. He argues that there are two kinds of supreme goods, one according to moral philosophy, having to do with this life, which is difficult to attain and extremely rare, and the other according to theology, which we await in the afterlife. He proceeds to discuss only the former supreme good and lists conditions for it, such as: it is supremely good, most perfect, self-sufficient, and delectable. This allows him to argue that the supreme good is not in voluptuousness, not in riches, or in health, and to dispute the Stoics and Plato. Finally, Dupleix argues for Aristotle's position, as interpreted by Piccolomini,¹⁰⁹ and contends that the doctrine is in conformity with or at least is not repugnant to Christian theology.

Du Moulin likewise argues that felicity, or the end of human life, must be praiseworthy and desirable in itself and that the means toward this end must be so as well. Felicity is the end for man, not qua citizen or king, policeman or student, but qua man—not for a portion of life but for a whole life. Moreover, there must be such an end: "God and nature do nothing in vain … and there is a natural desire in man for felicity, which would be in vain if it were impossible to be satisfied."¹¹⁰ Similarly as well, Du Moulin discusses

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the false supreme goods, such as honor and riches, and argues that happiness does not reside in power, pleasure, or habit, but in activity, and this activity must be proper to the noblest of our faculties, meaning the understanding rather than the will.¹¹¹ Where Du Moulin deviates slightly from Bouju and Dupleix is in his final chapter, devoted to the degrees of felicity. According to Du Moulin, there are two kinds of happiness, imperfect happiness, to be sought on earth, and perfect happiness that we hope for in heaven; imperfect felicity is a degree or step toward perfect felicity, which is the vision of God in our future life.

The consensus doctrine, which is shared by Goudin and Eustachius (and in many respects the Coimbrans and Gautruche), is a mixture of all these elements, making particular use of the distinction between objective and formal human blessedness that I have already noted in de Ceriziers and Frassen. Goudin, for example, argues that there is an ultimate end to human life, because there cannot be an infinite chain of final causes without a first final cause that begins to move the will. And if there were not an ultimate final cause for human life, human desires would be in vain. This ultimate end of human life must be sought in and for itself.¹¹² There are two features in happiness: the object whose possession makes us happy and the state that results from possessing this object; thus happiness can be objective or formal, depending upon whether one refers to the object or to the state. Thinking of the object of happiness, we can easily conclude (**p.69**) that happiness cannot reside in any created good—not in riches, honors, glory, power, corporeal pleasures. Man's happiness, both natural and supernatural, resides only in God.¹¹³ Referring to the formal happiness we can acquire, Goudin argues that perfect happiness cannot be obtained in this life, but man can obtain an imperfect happiness in this life. Perfect formal happiness resides in the intellect, in the vision of the divine essence— Goudin siding with Aguinas and against Scotus—and natural formal happiness resides in the activity of the intellect; that is, in the most perfect contemplation one can have of God in the natural order.¹¹⁴

The Principles of Human Actions, Passions, and Virtue

There is general consensus among textbook authors about the varieties of virtues and their definitions. They distinguish between intellectual and moral virtues. A few textbook authors—de Ceriziers, for example—spend a chapter or book describing the intellectual virtues, distinguishing among wisdom, intelligence of first principles, science, prudence, and art.¹¹⁵ But all of them devote considerable detail and multiple chapters or books to passions and moral virtues. Passions, according to Goudin, following Thomas Aquinas, are motions of the appetitive faculty arising from one's imagination of something good or harmful; they come in two kinds, concupiscible—such as love and hate, desire and aversion, joy and pain—and irascible—such as hope and despair, audaciousness and fear, plus anger (which does not have an opposite). Almost all textbook authors argue against the Stoics that one should control the passions, not get rid of them; Goudin thinks likewise about the controlling the passions, but considers the disagreement between Scholastics and Stoics to be merely verbal.¹¹⁶ Moral virtue, on the other hand, as Du Moulin puts it, "is the habit of an upright will that leads the appetite to honest things, to choosing a mean with respect to us and according to the dictates of reason."¹¹⁷ Du Moulin explains that

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moral virtue is a habit because it is not innate, but something acquired by exercise, like all powers of the mind, whether they are natural powers, habits, or passions. It resides in the will, rather than in the sensitive appetite. Thus, no action is praiseworthy if it is not voluntary. The will holds the sensitive appetite in check, choosing the mean, though not the arithmetical or geometric mean, between doing too much or too little; that is, determining when, how, for what cause, how much, and whether to act on a particular desire.

Given that virtue consists in the choice of the mean between extremes and that happiness lies in activity of the soul, some authors consequently feel the need to discuss the faculties of the soul or principles of human action. However, aside from some minor variations, there does not seem to be much diversity of opinions among these discussions. (**p.70**) All textbook authors distinguish the two faculties of the soul, understanding and will; a few add considerations about appetite and habit. All are in agreement that the will inclines only toward the good. Eustachius explains this very well:

The freedom of the will with respect to good and evil is not a *liberty of contrariety*, as if it could positively incline by its appetition toward plain contraries, namely toward good and evil as such; or as if it could by contrary actions incline to the good and also to the evil (for example seek the good and at the same time repudiate the good as such, or repudiate the evil and at the same time seek it as evil). It is, rather, a *liberty of contradiction*, insofar as it can either will or not will a good, or either reject (or actually repudiate) an evil or not reject (or actually repudiate) it. In other words, the will's freedom with respect to both good and evil it has the power to exercise of to suspend a given act.¹¹⁸

The issue of whether the understanding moves the will or is moved by the will is also usually raised. As Eustachius puts it:

The intellect is said to move the will, since there can be no action of the will unless, as a precondition, there is a prior action of the intellect. Now this alone would not be enough to enable us to say the intellect moves the will. But in addition, and most importantly, the intellect, by its antecedent awareness of an object or a goal, is the cause that makes such and such an act of will ensue. ... We say, then, that the will is moved by the intellect insofar as the *form* [*species*] of its action is concerned, since the intellect proposes to the will an object from which the acts of will take their form, as from an external formal principle. ... However, with respect to its *exercise*, the intellect is moved by the will in its free acts. For we all experience that we can apply our mind to learning something at one time, and can withdraw it again, when we wish. Moreover, the principle of action, and hence of understanding, is an end, since every agent operates for the sake of an end; yet the good in general, wherein lies the rationale for the goal of every human action, is an object of the will. Hence, it belongs to the will to move other faculties of the soul, including the intellect, to their respective acts.¹¹⁹

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After their discussion of the understanding and the will and virtue in general, the textbook writers usually proceed to detail the particular virtues. Some of them attempt various classifications of the virtues, discussing the four cardinal virtues, for example. Dupleix raises and rejects a number of opinions about whether the virtues are one or several kinds, including the opinion of the Stoic Chrysippus that there are as many virtues as there are qualities, and two versions of the opinion of other Stoics and Academics, following Zeno and Plato, that there is only one moral virtue, namely prudence. He concludes for Aristotle's view that there are different kinds of virtues, settling on eleven moral virtues, together with their extremes in both lack and excess; these are justice, courage, temperance, liberality, magnificence, magnanimity, regulated ambition, sweetness or clemency, truth, right behavior, and affability or courtesy.¹²⁰ Dupleix discusses these in great detail in the chapters that follow. Surprisingly, however, he (p.71) introduces another large set of virtues. Some of these, such as sobriety, chastity, and taciturnity, he reduces to temperance; patience and modesty to sweetness or clemency; hardiness and constancy, vigilance and diligence, to courage. But he keeps continence and obedience as semi-virtues, or dispositions to virtues, and he maintains virginity and saintliness as heroic Christian virtues. Finally, he argues that faith, hope, and charity are theological, not moral virtues; that is, gifts or graces from God.¹²¹

Bouju classifies the moral virtues according to whether they are exercised more for one's good than for the good of others and according to whether they are exercised more for the good of others than for one's good. He then devotes a book on justice and equity and another on friendship (though he does not decide the question of whether friendship is a virtue or merely accompanies virtues). He places, in the category of more for one's good, such virtues as temperance, honesty, sobriety, continence, and clemency, but also abstinence and virginity, which Dupleix considered heroic Christian virtues. In the second category, he treats courage, magnanimity, liberality, etc. He lists, in the category of justice and equity, such concepts as rights and law, but also religion, piety, and grace or gratitude. He seems, like all textbook authors (except Dupleix), to want to treat the virtues naturalistically, not mentioning theological or Christian virtues, by subsuming as many of them as possible into the moral virtues.

So with the main topics of Scholastic moral philosophy—happiness, virtue—the principal division between philosophers seems to be whether to treat these subjects naturalistically, that is as separate from revealed truths, or to consider the two together.

2.3. Some Elements of Physics in Late Scholastic Textbooks

Like the issue of logic, the challenge for Scholastics with respect to the sciences was to reconceptualize the materials of a number of disparate Aristotelian works into some kind of unity.¹²² Textbook writers such as the Coimbrans and Franciscus Toletus began by giving separate treatments of Aristotle's major works on natural philosophy: the *Physics, De caelo, On Generation and Corruption, Meteorology, De anima,* and *Parva naturalia*.¹²³ But even as they were writing formal commentaries on these natural philosophical works (giving Aristotle's text, paraphrases, and *quaestiones*), writers had already conceived their materials into an ordered sequence of books or topics. For

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example, here is Toletus' classification or ordering of the sciences from the beginning of his *Physics*: **(p.72)**

What is contained in natural philosophy is either about the principles or about the things composed out of the principles. The book of the *Physics* is about the principles of all natural things and their common properties; the rest are about what is composed out of them. Now, what is composed is either a simple body not constituted from others, or composite and mixed. If they are simple, they are either incorruptible, like the heavens, which are treated in the first two books of De caelo, or corruptible, like the elements, which are the concerns of the last two books.... As for composites, because generation and corruption and not only composite but also the simple elements themselves are common to all, On Generation and Corruption first discusses the one and then the others. Of composites, some are inanimate and some animate. Inanimate composites are treated first, and then animate. Among inanimate things some are sublime, and are called meteors, and occur above us, like winds, rain, rainbows, haloes, and the like. The books of the *Meteors* are about them. Some are beneath us in intrinsic parts of the earth, like metals and stones, which are treated in the books of Minerals. As for animate things, because the soul is common to them, they are treated first of all in the three books of *De anima*, and then certain things that proceed from the soul, namely sleep, waking, youth, age, life, death, and the like are treated in the book of Parva naturalia. After those subjects, animate things themselves: of which some are animals, some plants. Animals and their kinds are extensively discussed in the books of *Historia* and in the books *De partibus animalium*. Finally there is *De* plantis.¹²⁴

For Toletus, the order of the physical sciences is clearly specified; the principle of order dictates the sequence from principles to things composed of them and from simples to composites. And with very minor deviations, through a multitude of attempts to reconceptualize these materials under a variety of conceptual schemes, the order described by Toletus remained set for the seventeenth century: one discusses first the materials of the books of the *Physics*, then in succession those of *De caelo*, *On Generation* and Corruption, and Meteorology, and finally one details the subject matter of De anima; one might then add some topics from the shorter biological works (Parva Naturalia: On Sleep, On Dreams, On Youth, Old Age, Life and Death, and Respiration; plus History of Animals, Parts of Animals, and On Plants). That is the order followed by Dupleix in his *Physics* and by Eustachius a Sancto Paulo in part 3 of his *Summa*.¹²⁵ After a preliminary book on the order, subject or object of physics, and whether it is a science, Dupleix details the materials from Aristotle's Physics in three books: his book 2 is about Principles and Causes of Natural Things; book 3 concerns the definition of nature as a "principle of motion and rest of natural bodies"; 126 and book 4 is about (p.73) the elements thought to be needed for local motion, such as place, void, infinity, and time. Dupleix continues with the three books of materials from Aristotle's De caelo, On Generation and *Corruption*, and the *Meteorology*: book 5 on the heavens; book 6 on the elements; and book 7 on mixed bodies, such as meteors. He concludes his account with book 8, about

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the topics of the *De anima*, namely the three kinds of souls, vegetative, sensitive, and rational. Eustachius follows this sequence of topics but reconceives the materials as a tripartite *Physics*. He asks whether there is an order to be followed in the different parts of philosophy, and asserts that there is an order appropriate both for the nature of things and for doctrine, namely the order going from the most simple things to those more composite, from the principles to that from which they are constituted, at the same time progressing from the most universal things to the lesser universals, to the genera and species.¹²⁷ Eustachius also asserts that Aristotle made use of such an "order or method" in his writings on the various parts of philosophy: Aristotle in the *Physics* started with principles, causes, and the general properties of natural things then progressed "partly in analytic order and partly in synthetic order" from the most universal principles to the singular species of natural bodies; he then first differentiated the inanimate bodies—from the simplest, the heavens and elements in the De Caelo, to the mixtures and more composite bodies in the *Meteorology*.¹²⁸ Hence, after the Preliminary Questions, Eustachius' part 1 concerns Natural Body in General and encompasses (1) Principles, (2) Causes, and (3) The Common Properties of Things, namely infinity, place and void, time, and motion. Part 2 concerns Inanimate Natural Body and contains (1) The World and the Heavens, with an appendix on Geography, (2) Elements, and (3) Mixed Bodies. Part 3 is about Animate Bodies: (1) Generation of Souls, and (2) Vegetative, (3) Sensitive, and (4) Rational Soul.¹²⁹ I will limit my exposition of Scholastic physics to the Preliminary Questions, Natural Body in General, and the beginning topics of Inanimate Natural Body.

The Preliminary Questions

As with logic and ethics, these initial questions are typically about the order of the matter at hand (which we have just treated), its object or subject, and whether it is a theoretical or pratical activity, science or art; here we are concerned with the object of physics and whether physics is a true science. There is general consensus with respect (**p.74**) to these issues, as well as with respect to the difficulties that the questions are meant to discuss. Dupleix considers whether the object of physics is mobile being to the extent that it is mobile, that is: things subject to motion and change; mortal and corruptible things; sensible substances, which are the objects of our external senses; mobile body to the extent that it is mobile; or natural body insofar as it is natural. He settles on the last option.¹³⁰ Eustachius follows a similar reasoning to Dupleix and comes to the same conclusion:

The object of physics, properly speaking, is a natural body, insofar as it is natural. I say a *body* not an *entity* or *substance*, because each thing should be explained in terms of its nearest genus; hence it is more appropriate to say man is a rational *animal* than that he is a rational *entity* or a rational *substance*. I say *natural*, not *mobile*, because it is more fitting to explain something by its differentia than by a property; hence it is better to say man is a *rational* animal than that he is an animal that gives rise to laughter. Now natural is the proper differentia of the object of physical study (*physiologia*), while mobile is simply a property. Hence something is mobile because it is natural, but not vice versa. I add "insofar as it is natural" to prevent your supposing that a natural body comes under physics irrespective of

the way we consider it. If we consider it as something *capable of being healed*, it belongs to medicine; if we consider it as an *entity* it belongs to metaphysics. It belongs to physics insofar as it contains the principle of motion and rest. We call this a "natural body"—something that has a dual nature, namely matter and form—for these are called the principles of motion and rest.¹³¹

Physics is always ranked among the three theoretical sciences, along with metaphysics and mathematics, but, since the object of physics is natural body, as we have just established, one can raise some objections as to whether physics is truly a science. Dupleix argues that science is about eternal and necessary, certain and infallible things, and physics is about corruptible things, such as natural bodies; moreover, it contains false, uncertain, and possibly deceptive principles. Dupleix answers that physics is not about individual and singular things, but common and universal natures.¹³² Eustachius agrees; he bases the true and proper scientific character of physics on the many aspects of natural things, certain and indubitable both in themselves and to us, and on our ability to form true notions of them.¹³³ Scientific knowledge, in contrast to ordinary cognition, is causal knowledge. But natural philosophers do know many effects through their proper causes—for example, that every body is mobile because it is natural, and that the locomotion of every body is successive because it cannot be simultaneously naturally in two places. Hence, to that extent, their knowledge can truly be called scientific.

Eustachius admits that there are many propositions in natural philosophy that are only probable, and many causes that are perhaps unknown, but these defects are due (p.75) to the knower, not to the science. Furthermore, a science does not necessarily have to be complete; it is sufficient if at least some propositions in it are known with certainty and demonstrated through their true, though not yet accurate, causes. To say that science deals with perpetual, unchanging things means that the propositions of a science must be indubitable and eternally true. The objects about which the statements are predicated may be mutable in their natural being, but the propositions themselves cannot be subject to change. Thus, for instance, the statement "every mixture is dissolvable" is universally and necessarily true, even though this particular mixture has not yet been dissolved; the same is true of the statements "every animal is mortal" and "every man is rational." Scientific propositions are not always composed of abstract universals as in the statement "man is rational." They may also consist of collective universals; that is, of individuals taken universally and collectively. The statement "every man is mortal" is an example of such a proposition. Eustachius then explains that it is not always necessary to have a plurality of individuals upon which to base a universally true proposition. In the case of such particular objects as the Sun, the Moon, the individual heavens, and the four elements, where there is only one individual of the same nature, it is possible to make statements that are universally true:

Indeed, although the object of the total science is always something universal, still it is possible for some part of the total science to deal always with some particular object. Such is the case when, given the present universe, there cannot be many individuals of the same nature. For that reason, the physicist according to custom

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treats of our Sun, Moon, individual heavens and four elements. However, the propositions that are made about such objects are universally true. For example, this proposition, "whenever the moon comes into the shadow of the earth, an eclipse occurs" is about a particular thing, yet is universally true. This is sufficient for the notion of a science.¹³⁴

Eustachius regards these particular objects as enjoying a privileged status, so that the propositions concerning them are universally true and may be incorporated into the science of physics.

Natural Body in General

In this first part of Natural Philosophy, we are dealing with all of the materials discussed in the eight books of Aristotle's *Physics*, from principles and causes of mobile things, to their properties: motion itself, infinity and continuity, place and the possibility of void, and time. One locus of disagreement in seventeenth-century Scholasticism involves the principles of things: matter, form, and privation. As Dupleix wrote in 1603: "There is so much great noise among the Scholastics concerning the establishment of matter, that if I wanted to appease all sides, I would waste too much time."¹³⁵ Traditionally, matter and form are inseparable. All substances are informed matter. Form is associated (p.76) with actuality and matter with potentiality: to be in actuality is to participate in a form and to have potentiality is to have a "power" of acting or undergoing something.¹³⁶ In this conception of substance, matter has the potential for receiving forms, whether substantial or accidental. Forms are kinds, or universals, and matter provides the individual substance with its particularity. Thus, matter is the principle of individuation, always subordinate to form, which makes it a recognizable entity of such and such a kind. Substantial change, or mutation, that is generation and corruption, is a change in the very nature of a thing, its acquisition or loss of a substantial form. Substantial forms are said to be indivisible, not capable of more or less, and not possessing contraries, and thus they cannot be acquired successively and piecemeal.

Short of substantial change, motion, in contrast, occurs successively between contraries; motion must pass from one contrary to the other contrary. According to its Aristotelian definition, "the actualizing of what is in potentiality insofar as it is in potentiality,"¹³⁷ motion is an imperfect actuality, the actuality of a being whose potentiality is being actualized while it still remains in potency for further actualization. A being moves, then, by virtue of the successive acquisition of qualitative or quantitative forms or of places. For example, water becomes hot by the acquisition of heat, which it has the potential for acquiring. Forms in the categories quantity, quality, and *ubi* or place have contraries or positive opposite terms. Thus, true motion is only in those three categories, which entails that there are three kinds of motion: augmentation and diminution (in the category of quantity); alteration (in quality); and local motion (in place). But since a thing cannot both be in actuality and potentiality at the same time with respect to the same form, no object undergoing change can be the active source of its own change or motion; rather, it would have to be moved by an agent already possessing the actuality it itself lacks. Water, for example, cannot be the active cause of its own heating, whereas fire can be the cause of

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the water's heating, given that fire is actually hot and can turn the water's potentiality for heat from potency to act. That which moves, the agent that introduces a form, must possess the form or actuality; that which is moved has the power or potentiality for receiving the form: "in physical change, all these are found: an agent, a patient ... and furthermore an acquired form, and a way or medium by which it is acquired."¹³⁸ The thing which moves and the thing moved are therefore not the same, resulting in the principle that everything moved is moved by some other thing. Another consequence of the definition of motion is that rest is opposed to motion; it is the privation of motion in the thing that is naturally capable of motion and, inasmuch as motion is made to accomplish rest, it is also said to be the end or perfection of motion. However, living things are moved as well by an internal principle of motion, and the elements, that is the simple bodies, are carried to their natural places by their forms, which tend to (**p.77**) their natural places (the natural place of earth being in the center of the universe, surrounded, in order, by the natural places of water, air, and fire).¹³⁹

An important change in the Aristotelian theory of motion was the adoption of *impetus* theory by the late Scholastics, including Toletus, who (along with Julius Scaliger) was usually cited as the authority in favor of *impetus* by textbook authors in the seventeenth century.¹⁴⁰ *Impetus* was an attempt to solve a difficulty in the Aristotelian theory of motion: the continued lateral motion of a projectile. Aristotle argued not only that everything in motion is moved by something else, but also that the mover must be in contact with the moved thing. In the case of projectile motion, the only thing in contact with the mover of the projectile gives the air immediately surrounding it the power to move the projectile further and that this power is passed on through the medium with the projectile. Scholastics rejected this solution and proposed instead that, when a projectile is thrown, the mover transmits an *impetus* to it, which then continues to act as an internal cause of its continued motion.

The association of matter with potentiality also suggests that prime matter would be pure potentiality or nothing. In contrast, the association of form with actuality suggests that an ultimate form, or pure actuality, might subsist by itself. The textbook questions typically discussed in conjunction with these doctrines concern whether matter is a substance, whether potency is the essence of matter, whether matter is not capable of being generated or corrupted, whether matter is disposed to receiving the form, whether matter or form is the cause of corruption, whether some forms preexist in matter, in what way form arises from matter, whether forms can be outside matter, and, ultimately, whether there can be any prime matter separate from forms. There is much agreement and disagreement in the answers given to these questions. One can point to almost universal agreement among late Scholastics concerning the negative answer to the question of whether forms are generated from matter. Although late Scholastics usually repeat the phrase: "form results from the potentiality of matter, that is, from the natural aptitude of matter to receive various forms in succession," they do not understand it as indicating that form receives its nature from matter.¹⁴¹ Similarly, seventeenth-century Scholastics agree that at least one form can subsist without matter, namely rational soul.

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At times, there is sharp disagreement on whether matter can exist without form. Dupleix puts the disagreement into relief:

Thus matter deserves the name of substance because it subsists by itself and is not in any subject. This reply is based on the Philosopher's doctrine, but it does not satisfy everyone, particularly **(p.78)** Saint Thomas Aquinas and his followers, who hold that such matter is not in nature, and cannot be in it, and even that this is so repugnant to nature that God himself cannot make it subsist thus stripped of all form. But this opinion is too bold, too mistaken, and as such it has been rejected by Scotus the Subtle [Doctor] and by several others who convicted Saint Thomas by his own words.¹⁴²

Dupleix further asserts that matter subsisting without form "is not repugnant to nature and still less to divine power, which is infinite and above everything in nature." He adds that "even though matter is not found separated from forms, it is nevertheless something distinct and separate from form in essence, and it even precedes form when one considers the generation of natural things."¹⁴³ The fine line Dupleix wishes to draw is exhibited when he considers the creation of matter and form. He states that there is never any matter without form in nature but that we can conceive matter without form, without in any way upsetting the natural order:

In the same way we ordinarily consider the virtues, vices, colors, dimensions and other accidents outside their subject, even though they are never separated from it, we can consider substances without having any regard to their accidents, which can be elsewhere than in them. That is why the ancient Pagans did not recognize that God created this matter as well as the forms at the beginning of the world, and thinking instead that it was something separate from forms, they imagined a chaos, a confused and unformed mass corresponding to this prime matter, from which they made all things arise.¹⁴⁴

Dupleix's doctrine is clear: matter can exist without form naturally and by supernatural action; we can conceive it thus; but it simply does not so exist, given that it was created simultaneously with form; still, it could. Most late Scholastics supported something like Dupleix's view. In contrast, the Dominican Goudin maintained the extreme Thomist position, arguing: "It seems that matter cannot exist without form even by means of God's absolute power. That is what Saint Thomas states (III quodlib. art 1). God himself cannot make it that something exist and not exist. He cannot make something that implies a contradiction and, consequently, he cannot make matter be without form."¹⁴⁵

As the Scholastic position became somewhat more dualistic than hylomorphic, with matter being endowed with being, another trend was the shifting of one of the principal functions of matter to form. The principle of individuation became form, instead of matter, with consequent changes in what is meant by form. We can grasp the change in position when we read Dupleix's exposition of form in his *Physique*. The question Dupleix wishes to answer is why there is not a prime form common to all matter, as there is prime matter common to all forms. His answer is that: "Form is not only that which gives being to

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things, but also that which diversifies and distinguishes them from one another. Thus, nature, which is pleased with diversity and variety, cannot **(p.79)** allow there to be a form common to all matter, as there is a matter common to all forms; if there were only a single form, as there is a single matter, all things would not only be similar, but also uniform and even unitary."¹⁴⁶ Dupleix identifies this as the Scotist position (though it is not exactly that). It entails that form is the principle of individuation and it appreciably alters what one means by form. Forms are no longer necessarily specific. Thus form is on its way to becoming just the way a particular part of matter is differentiated: ultimately, structure or shape, rather than the organizing principle that makes the thing the kind of thing it is.

Another unusual discussion in early modern textbooks concerns exemplary causation. It provides the occasion for the discussion of ideas in the philosophical corpus of seventeenth-century Scholasticism. Bouju discusses ideas, giving a standard exposition of the issue. He enumerates the Aristotelian causes (material, formal, efficient, final) and adds a discussion of "exemplary causation":¹⁴⁷ Ideas are identified with exemplars, that is either Platonic ideas or ideas in God's mind, and the question is whether in serving as models for creation, ideas (as exemplars) *cause* the things that imitate them in some fifth way. An architect in building a house tries to make it like the one "he has in his mind," a physician has an idea of health, and so on. Bouju is echoing a well-established Scholastic tradition in which ideas are either forms in God's mind according to which he makes things, or exemplars in artificers' minds when they make their objects, houses, statues, or paintings. Ideas as exemplars are general, not particular forms, patterns to be followed in this or that case, rather than particular mental events. He writes:

But this cause is not of another kind than the four we have posited, since, according to the opinion of most philosophers, it reduces to the formal separated and external cause; as the thing is determined and derives its specific perfection from the form which is part of the composite and its internal cause, so also, in the same way the work of the artisan is in its way determined according to its particular perfection through the exemplar that resides in his mind, to which he refers when making the artificial thing by introducing something similar in it.¹⁴⁸

Bouju's argument echoes Thomistic usage.¹⁴⁹ For Aquinas, as for Bouju, the idea that is "in the mind" is a form, rather than a particular mental act. It is an analog of the patterns in God's mind, where ideas primarily exist. That there are exemplars in God's mind raises an important side issue: whether the intellectual soul knows material things in the eternal exemplars. One could argue that the soul does not know the eternal exemplars because it does not know God, in whom the eternal exemplars exist; **(p.80)** the eternal exemplars are known through creatures, and not the converse. If the intellectual soul knows all things in the eternal exemplars, then all knowledge would be derived from the exemplars. Bouju follows Aquinas on these issues, asserting that the intellectual soul knows all truths in the eternal exemplars but distinguishing between the soul in its present state of life, which cannot see all things in the eternal exemplars, and the blessed, who see God and all things in him, and thus who know all things in the eternal exemplars.

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Bouju gives us an instance of a standard approach to the nature of ideas with no hint of a psychological sense; that is, of idea as a particular mental event. On the other hand, Eustachius does suggest a revision of the traditional meaning of the term. As is customary, *idea* is taken by Eustachius to be synonymous with *exemplar*, and exemplars are discussed under the topic of causation. Again the question is whether exemplary causes constitute a fifth class in addition to the canonical four. Eustachius' answer is that in the case of natural causation exemplary cause may be taken to be a kind of efficient cause, and in the case of an artificer it belongs to formal cause. Eustachius writes:

What the Greeks call *Idea* the Latins call *Exemplar*, which is nothing else but the explicit image or species of the thing to be made in the mind of the artificer. Thus the idea or exemplar is in this case some phantasm or work of fantasy in the artificer to which the external work conforms. And so in the artificer insofar as he is an artificer there are two internal principles of operation, namely the art in his mind or reason and the idea or exemplar in his fantasy. Art is a certain disposition, but idea is a certain act or concept represented by the mind. So, the mind first represented, and directs the external work to its likeness.¹⁵¹

Here idea *is* an image; it is "an act or explicit concept of the mind." It is both something I do—an act—and something I see: "the mind ... contemplates what it has represented."

Eustachius also seems to differ significantly from the standard view about infinity. Scholastic terminology for dealing with the problems of infinity was imported from logic. Logicians distinguished between categorematic terms and syncategorematic terms, or terms that have a signification by themselves and terms that do not (cosignificative terms). Examples of the first kind are substantival names and verbs and examples of the second kind are adjectives, adverbs, conjunctions, and prepositions.¹⁵² The distinction is applied to infinity to yield both a categorematic and syncategorematic infinite. With the distinction one can solve logical puzzles, since it may be true (**p.81**) that something is infinite, taken syncategorematically, and false that something is infinite, taken categorematically. The standard view was the denial of the categorematic infinite (in number and magnitude) and acceptance of the syncategorematic infinite (in number and magnitude). Seventeenth-century doctrines generally conflated syncategorematic infinite with potential infinity and categorematic infinite with actual infinity, and denied the inference from syncategorematic infinite to categorematic infinite. This resulted in the denial of infinity in act. However, these Scholastics were also careful to state that God could create a categorematic infinite.¹⁵³ In his *Physics*, Toletus treats such topics as the categorematic infinite, division into proportional parts (parts whose magnitudes diminish by halves), and the question whether a body can be actually infinite,¹⁵⁴ but he affirms the standard position.¹⁵⁵ Roughly the same can be said about the Coimbrans¹⁵⁶ and Abra de Raconis.¹⁵⁷ However, it looks as if Eustachius thinks of syncategorematic infinite as a species of infinite in act. Eustachius divides the infinite into infinite in actuality and potential infinite. He then divides the former into categorematic actual infinite and syncategorematic actual infinite, depending upon whether all the parts of a given infinite

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are actually separated or not. Infinites whose parts are not all in actuality are of three kinds: infinite in succession, addition, and subtraction.¹⁵⁸

Eustachius does assert that the continuum is divisible into infinite parts. But, in the final analysis, his deviations from the standard view are more superficial than real. He argues that the continuum is not divisible by equal magnitudes, but by equal proportional parts. Thus it is infinitely divisible successively, and not simultaneously. The continuum is divisible to infinity not so that there can exist simultaneously actually separated infinite parts, but so that one can progress in the division.¹⁵⁹ Eustachius consequently does not hold that syncategorematic infinites are properly speaking actual infinities. In fact, he reaffirms that "only the actual categorematic infinite is truly and properly infinite.... Thus the actual syncategorematic infinite is not properly an infinite in act ... it is to be called potential infinite."¹⁶⁰ In this way he rejoins the standard doctrine. He further denies that a created intellect can know clearly something infinite: **(p.82)**

Can the human mind encompass in thought a thing that is infinite? Since some concepts of the mind are distinct, and others confused, and some things can be known in a moment, others in time (and time may be finite or infinite), this question cannot easily be solved except by making some distinctions. If we are talking only of confused conception, it is certain that the infinite can be known in this way by a created intellect. But if we are talking of a distinct conception, and one that occurs in a moment, or in finite time, there is a greater problem. We think, however, that the infinite cannot be known in this manner by a created intellect, at least by means of its natural powers.¹⁶¹

Like the other textbook writers, Eustachius is also careful to uphold God's absolute omnipotence when denying him the power to create a categorematic infinite: "There is no actual categorematic infinite, not because it is repugnant to God's power, but because nature cannot suffer it."¹⁶² This situates Eustachius' answer to whether God can produce an infinite body close to the opinion of Dupleix and de Ceriziers: there is no infinite body in nature and it is not repugnant to God's power not to be able to produce one.¹⁶³

Eustachius is also fairly unorthodox in his treatment of place and time, developing some views about imaginary place and imaginary time as reference frames for the motion of the whole universe or of the time that preceded the creation.¹⁶⁴ Seventeenth-century discussions of place usually involved two important questions about the immobility of place and the place of the ultimate sphere. Aristotle's primary spatial concept was "place," or location in space, space being the aggregate of all places. He defined place as the boundary of a containing body in contact with a contained body that can undergo locomotion. But he also asserted that place is the innermost *motionless* boundary of what contains. Thus, the place of a ship in a river is not defined by the flowing waters, but by the whole river, because the river is motionless as a whole. These definitions gave rise to questions about the place of the ultimate containing body, the ultimate sphere of a universe constituted from a finite number of homocentric spheres. If having a place

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depends on being contained, the ultimate sphere will not have a place since there is no body outside it to contain it. But the ultimate sphere, or heaven, seems to need a place because it rotates, and motion involves change of place. Aristotle recognized these difficulties. His solution involves a distinction that comes to be formulated as holding between place *per se* and place *per accidens*. Place *per se* is the place that bodies capable of locomotion or growth must possess. Place *per accidens* is the place some things possess indirectly, "through things conjoined with them, as the soul and the heaven. Heaven is, in a way, in place, for all its parts are; for on the orb, one part contains another."¹⁶⁵

(p.83) The Thomists and Scotists developed these Aristotelian views and produced terminology that was echoed in the seventeenth-century Scholastic discussions of these issues. According to Aquinas, following Aristotle, the parts of the ultimate sphere are not actually in place, but the ultimate sphere is in a place accidentally because of its parts, which are themselves potentially in place.¹⁶⁶ The technical vocabulary developed to interpret Aquinas' view was a distinction between material place and formal place (where formal place is the real ratio of place). Place is then movable accidentally (as material place) and immovable per se (as formal place, defined as the place of a body with respect to the universe as a whole). Thus the ship is formally immobile with respect to the universe as a whole when the waters flow around it. However, Scotus and Scotists rejected the Thomist distinction, arguing instead that place is a relation of the containing body with respect to the contained body. Place is then a relative attribute of these bodies. (They also made use of the term ubi, sometimes referred to as inner place, to denote the symmetric relation of the contained body with respect to the containing body.) Since the relation changes with any change of either the contained body or the containing body, the place of a body does not remain the same when the matter around it changes, even though the body in question might remain immobile. When a body is in a variable medium, the body is in one place at an instant and in another at another instant; to capture what is meant by the immobility of place, Scotists said that the places are distinct but *equivalent places* from the view of local motion.¹⁶⁷ On the question of the ultimate sphere, Scotus denied both Averroes' and Aquinas' solutions, claiming that heaven can rotate even though no body contained it and could rotate even if it contained no body (even if it were formed out of a single homogeneous sphere).¹⁶⁸

In the seventeenth century, Toletus took Aquinas' side against Scotus on the question of the immobility of place,¹⁶⁹ as did Théophraste Bouju, who also kept some Averroist elements.¹⁷⁰ Eustachius, in contrast, used Scotus' vocabulary: place and *ubi* are relations between the containing and contained bodies, and places are the same *by equivalence*.¹⁷¹ Eustachius also developed some fairly novel views about the place of the ultimate sphere.¹⁷² This is where the concept of imaginary place fits in: the place of the outermost sphere is internal place or space and external, but imaginary place.¹⁷³ Abra de Raconis and others held a similar doctrine. De Raconis discussed two kinds of **(p.84)** places, external and internal, external being the surface of the concave ambient body, and internal being the space occupied by the body.¹⁷⁴ The ultimate heaven is in place is the

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surface of the concave ambient body. "Imaginary place" thus became the standard answer to such questions as to where God could move the universe, if he chose to move it, and what there was before the creation of the universe; that is, before the creation of any corporeal substance. Imaginary places, however, were generally thought of not as real things, independent of body, but on the model of a privation of a measurable thing, like a shadow, given that a privation of a measurable thing can be measured.¹⁷⁶ One can also find, however, a rejection of the doctrine of imaginary space, conceived as the place in which God resides. The argument is that either these spaces are something or they are nothing. If they are something real, then they should not be called imaginary. If they are nothing, then God cannot reside in that nothing. Since God can create a world outside the universe, he must therefore reside in the space that the new world would occupy. This would be true, if there were such a space. But if there were no such space, God could not reside in it. Conclusion: "Since there is no other space than the one we conceive as possible, we cannot more properly say that God is in that space than that God is in the people who will be born in the centuries to come."¹⁷⁷

Dupleix drew a sharp contrast between Thomists and Scotists about the theory of place. He held that place is immobile in itself, while bodies change places. He took it that Aquinas had a different opinion, interpreting Aquinas' doctrine of formal place as the view that one can imagine a distance from each place to certain parts of the world, with respect to which a given place, though changeable, may be said to be immobile.¹⁷⁸ Dupleix preferred a doctrine he attributed to Philoponus and Averroes, that when air is blowing around a house, one says that the place of the house changes accidentally. The house is in the same place by equivalence. On the subject of the place of the universe, Dupleix also rejected Aquinas' opinion.¹⁷⁹ He held that the heavens do not change place or move locally, since they merely rotate within their own circumference. As with matter and form, the debate about the concept of place was not completely settled by the second half of the seventeenth century. Gautruche rejected the Thomist doctrine of place, including the Thomist doctrine that the universe cannot move as a whole,¹⁸⁰ while others such as Barbay and the Jesuit Vincent opted for some middle ground,¹⁸¹ and a few Thomists resolutely maintained their position.¹⁸² Hidden within the debate between Thomists and Scotists on the question of the mobility/immobility (p.85) of place and the place of the ultimate sphere were questions about the relativity of motion or reference for motion. Some thinkers supported a Thomist doctrine in which the motion of a body is referred to its place, conceived as its relation to the universe as a whole, a universe which is necessarily immobile; others supported a Scotist doctrine in which the motion of an object is referred to its place, conceived as a purely relational property of bodies.

Scholastics also discussed the possibility of void spaces and motion in the void. By the seventeenth century, the standard Scholastic position about the void was that nature abhors a vacuum because nature's parts are connected and influence each other,¹⁸³ but God's ability to produce a void—for example by annihilating the sphere of fire or air and not substituting another body for it—cannot be denied.¹⁸⁴ But, assuming that God chose to create a void, a question arose about whether there could be motion in that void. Aristotle had concluded against the atomists that motion is impossible in the void, using an

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argument deriving from his principles of motion. A body moving by impact moves in proportion to the force exerted on it and in inverse proportion to the resistance of the medium in which it is situated. Since a void would provide no resistance, the body "would move with a speed beyond any ratio"¹⁸⁵—but such instantaneous movement is impossible. Scholastics attempted to soften this and similar arguments, not so much as to accept the existence of the void, but so as to accept its possibility; that is, to argue that God could create a void. A reading of Aristotle that became standard in the seventeenth century was that he denied motion in the void, in contradiction to other ancients, only because they did not posit any other cause for the duration of motion than the resistance of the medium; according to this reading, Aristotle would agree that motion in the void would not be instantaneous and, although vacuums do not naturally occur, they are not impossible supernaturally. The same conclusion was also reached in disagreement with Aristotle. For example, Toletus understood Aquinas as holding against Aristotle that motion in the void would not be instantaneous and supported Aquinas' position.¹⁸⁶ Other writers, such as Dupleix, also denied Aristotle's argument against the impossibility of motion in the void, asserting that the speed of the motion would not be due just to the resistance of the medium, but also to the weight and shape of the moving body.¹⁸⁷ René de Ceriziers' chapters on void are typical of late Scholastic discussions:

Aristotle teaches, in the fourth book of his *Physics*, that motion in the void would be instantaneous because he assumes that the duration of that motion arises only from the resistance of the space. But who does not see that the motion arises also from the quality that produces it, from the succession of its parts, and the distance of its terms? ... We are led to believe that the **(p.86)** Philosopher denied motion in the void against the ancients only because they did not posit any other cause of its duration than the resistance of the medium. From this one could derive the absurdity that a feather would fall as fast in the void as the grindstone of a mill, if it is true that the weight of a body and the distance of its terms cannot be considered.¹⁸⁸

The Scholastic denial of the void was therefore less categorical than its Peripatetic counterpart.

In somewhat the same way as space, the concept of time involved questions about whether it is dependent or independent of bodies, whether it is mind-dependent, and whether there is an absolute reference for it or it is radically relative. One can find disagreement over such issues at the start of the seventeenth century. Many Aristotelians thought time dependent on bodies, but not mind-dependent. Others sided with Augustine, thinking it independent of the motion of bodies. Aquinas seems to have accepted the Aristotelian doctrine that without motion there would be no time,¹⁸⁹ but Scotus rejected many elements of Aristotle's doctrine; inspired by Augustine's theory of time, Scotus argued that, even if all motion were to stop, time would still exist and would measure the universal rest.¹⁹⁰ The standard late Scholastic view seems to have been that time began with the motion of the heavens and will end with it also. Toletus argued a Thomistic line that if there is no motion, there is no generation or time.¹⁹¹ In contrast,

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Eustachius argued for the successor to the Scotist line: time is divisible into real time and imaginary time, where imaginary time is that which we imagine precedes the creation of the world. No time elapsed when time and the world began, but an immense privation of time—an imaginary time—preceded the creation.¹⁹² And Dupleix referred favorably to Augustine's account of time and talked of time measuring both motion and rest.¹⁹³ René de Ceriziers summed up the apparent consensus about time in seventeenth-century Scholasticism: "Aristotle claims that time is the number of motion or of its parts, insofar as they succeed one another. Now it is certain that time is a work of our mind, since we construct a separated quantity from a continuous one, naming it the number of motion, that is, of the parts that we designate in it. There are two kinds of time: internal is the duration of each thing or its permanence in being, external is the measure of this duration."¹⁹⁴ De Ceriziers then discussed a criticism of the argument that time measures rest and is thus not dependent on motion: "rest is to time as darkness is to light; it is even impossible to understand rest except by relation to motion"; but he limited the critique, saying, "there is no being composed out of what is (p.87) not ... One can say that time is composed of instants or parts whose nature consists in existing by fleeing ... Time is distinguished from motion and the existence of the being only by the various relations that things have among one another."¹⁹⁵ However, as with the questions about space, the debate about time, whether it is mind-dependent and whether it is dependent on motion, continued into the seventeenth century with most supporting a Scotist line and Dominicans such as Goudin supporting the Thomist position.¹⁹⁶

Inanimate Natural Body

The topics discussed under this heading generally comprise those of the *De caelo*, *On Generation and Corruption*, and the *Meteorology*, in that order. I will limit my discussion to some novel views in Scholastic textbooks arising from the telescopic discoveries made during the first half of the seventeenth century; these concern questions about the nature of the heavens, and touch upon topics discussed in *De caelo*, but also concern topics usually discussed in the *Meterorology*, such as comets.¹⁹⁷

It can readily be shown that the solid eccentric-epicycle model for the heavens was fashionable during the first half of the seventeenth century. It was the model represented in 1609 in Eustachius a Sancto Paulo's *Summa*.¹⁹⁸ But that model, which fit reasonably well with the Aristotelian doctrine of the heterogeneity of the sublunar and supralunar regions, where the supralunar region was the subject of the *De caelo* and the sublunary region was the subject of *On Generation and Corruption*, and *Meteorology*, was under great pressure throughout the seventeenth century, because of the Galilean novel astronomical observations of 1610–13. Moon spots and sunspots seemed to argue for the homogeneity of the two regions, and comets looked like they were supralunar, making them an appropriate subject for discussion in *De caelo*, instead of the *Meteorology*—both arguing against the solid eccentric-epicycle system.

The standard view of comets is that the new star of 1572, and Tycho Brahe's measurement of the parallax of the comet of 1577 concluding that the comet was in the

heavens, and thus incompatible with the existence of the "crystal" spheres, epicycles, and eccentrics of the Aristotelians, had dealt a heavy blow to the traditional view of the immutability and perfection of the heavens.¹⁹⁹ But Tycho Brahe's parallax measurement was neither universally accepted nor without conceptual difficulties. As Dupleix explained, **(p.88)**

Since comets are elevated very high into the region of air and are moved and shaken by the celestial bodies that carry them, the elementary fire, and the upper air, and also because they look like true stars, because of their flame, several ancient philosophers, and even Seneca and the common people ignorant of this matter still, take comets to be true stars. But this ignorance is too crass, given that stars are all in the heavens and comets are in the region of air below the moon, as is demonstrated by astronomical instruments [note in the margin: Regiomontanus, *de Cometis*].²⁰⁰

Dupleix's reference to Regiomontanus, a marginal note on his comment about astronomical instruments, indicates that, some decades after Tycho's measurements, some scholars still preferred Regiomontanus' earlier parallactic measurements concluding that comets are sublunary.²⁰¹ Dupleix implies as well that the question of the composition of the heavens and the nature and location of comets was a standard dispute between the Stoics, such as Seneca, and the Aristotelians. And, as with most everything Stoic, fluid heavens could also be incorporated into Aristotelianism. Bouju had argued as an Aristotelian that there is no sphere of fire and no absolute division between the sublunary and superlunary world, but Bouju upheld the de facto incorruptibility of heaven; he posited some kind of ethereal substance in the heavens, and even accepted, in principle, the possibility of substantial change in the heavens, with the Stoics, but he maintained a standard Aristotelian account of comets.²⁰² However, Bouju accommodated other novel astronomical phenomena, such as novas; he stated:

We have seen in our time, during 1572, a new star appearing in Calliope and lasting two years. In the beginning this star seemed to surpass Venus in size and clarity and two months later it decreased in these respects, such that it no longer seemed to exceed a star of the third magnitude; it kept this quantity for the duration of two years, when it disappeared. It cannot be said that this star was in the air where comets usually happen, because it appeared in the same way to all who saw it, in whatever region it was, and it always moved from east to west like the other stars; this could not happen if it were located only in the middle region of air, the place of comets.²⁰³

Bouju showed himself to be open to the possibility of comets moving well above the region of air, something he accepted for the nova of 1572, but he did not think he had enough evidence in 1614 to claim that any comet resided there.

(p.89) Textbooks in the seventeenth century seem genuinely undecided about whether comets are sublunary or supralunary. For example, de Ceriziers discussed various opinions concerning comets, including the possibility that comets are engendered in the

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heavens but are corruptible, that they are exhalations attracted by the sun, and that they are wandering stars having different motions above and below the heavens than the planets (requiring the hypothesis of fluid heavens, which he rejected). De Ceriziers asked: "But why would we not see comets ordinarily, if they were stars? Why would they not have the shape of other stars?" and in 1643 he concluded, "Let us believe with the Philosopher that comets are exhalations that are ignited in the upper region of air."²⁰⁴ But the denial of superlunary comets seems to have been waning by the midseventeenth century. One can read in the textbook of Pierre du Moulin, in 1644: "Aristotle holds that comets are fiery exhalations; but the astronomers of this time have observed that a comet was above the moon. If that comet was a fiery exhalation, it would have always kept its tail behind it, in the manner of a torch, which when carried always keeps its flame behind it. And the fact that it was seen by so many in so many countries demonstrates its great height."²⁰⁵ Du Moulin invoked anti-solarity to argue that some comets are not fiery exhalations. He expected the moving fiery exhalations to point away from their direction of motion and not to point away from the sun. He also constructed an argument about the distance of comets based on their being visible at many places at the same time; this is obviously a common-sense way of getting the parallax arguments across. Du Moulin concluded that there are two kinds of comets, sublunary fiery exhalations à la Aristotle, and celestial objects: "I believe that both opinions are true and that there are two kinds of comets. The comets of the first kind are miraculous and celestial and above the moon; and consequently they are more meaningful."²⁰⁶ By the second half of the seventeenth century, one can find a number of Aristotelians accepting comets as celestial objects. One can even find a two comets theory, in which both kinds of comets are non-miraculous:

It must be said that there seem to be two kinds of comets: some are permanent bodies placed in heaven, appearing and disappearing with respect to us; others are only meteors produced by terrestrial exhalations, appearing in the highest regions of air and being ignited there. Proof of the first part. Most of the comets recently observed are certainly higher up than the moon. Now, there cannot be any new production in this part of heaven, as needed for the second opinion. Therefore, these are permanent bodies.²⁰⁷

As the textbook writers indicated in their own ways, there turned out to have been no difficulty with comets being stars, except that if they were stars, they could not have become sublunary. No one ever suggested (nor could they have lived if that had happened) that a comet crossed the division between the sublunary and supralunary world. On the other hand, if a comet, seen as a star, had a path that carried it across the **(p.90)** celestial spheres, then a revision of the solid eccentric-epicycle model would be called for. One might be led to adopt a Tychonic or semi-Tychonic system on account of comets, a path taken by many Jesuits. Ultimately, the Tychonic system was also taken up as a modification of a general Aristotelian point of view. Still, an Aristotelian would prefer the hypothesis of solid heavens, as Goudin amply demonstrated:

It seems more probable that the heavens are solid. First objection. The solidity of

the heavens cannot be accounted for given the facts observed recently. The improvements of the telescope and the serious studies of our astronomers have made this hypothesis incapable of being sustained. For example, we notice that Mars appears at times higher and at times lower than the sun; that Venus and Mercury revolve around the sun and are at times below it, at times above it, and at times to its side; that there are satellites around Jupiter and Saturn; that the sun and Jupiter rotate on their axes, etc.

Reply. Saint Thomas tells us to refer to the experts with respect to such questions; if the phenomena observed by the astronomers really do seem in opposition to the solidity of the heavens, we would no doubt abandon our conclusion; but in the midst of so many people who yell so loudly, we are still allowed to listen to some very renowned astronomers, among whom is Giovanni-Domenico Cassini, Director of the Royal Observatory, eminent light of astronomical science, and these astronomers tell us that, until now, none of the observed phenomena are contradicted by the hypothesis of solid heavens.²⁰⁸

But Goudin, like many others in the second half of the seventeenth century, was ultimately able to accept the hypothesis of fluid heavens: "The heavens can be fluid and continue to be incorruptible. It is not impossible for a fluid body to be incorruptible: the air, water, and blood of the Blessed after the Resurrection, as well as their vital and animal spirits, will be fluid, in the same way that ours are now; yet they will be incorruptible."²⁰⁹

One could, of course, argue that these textbook treatments of the nature of the heavens were simply mistaken and that, in their adoption of Tychonic cosmology, Scholastics closed their eyes to counter-evidence and to better cosmologies. Against this, one needs to reply that such questions were generally undecided in the seventeenth century and that the Scholastics even got the better of the similarly mistaken views of some natural philosophers such as Galileo.

With regard to comets, one should count Galileo and his disciple Guiducci among Tycho's opponents. The Jesuit astronomer Horatio Grassi argued against Aristotle's cometary theory based on the lack of observable parallax for the comet of 1618. But Galileo and Guiducci disputed his findings, contending that one cannot use the parallax of a comet to calculate its location: "Whoever wishes the argument from parallax to bear upon comets must first prove that comets are real things."²¹⁰ For Galileo and **(p.91)** his disciple, parallax is a valid method only when one has a real and permanent object; for example, one cannot use the parallax of a rainbow to calculate its location. Thus, the parallax of a comet (or its lack of parallax) cannot give us its supralunary location and is not evidence for concluding that the Aristotelians are wrong (or for concluding further that there is an imperfect terrestrial object in the heavens) unless, of course, we had previously accepted comets as objects whose nature is terrestrial, and not meteorological phenomena or mere appearances. Though Galileo does not need to think that the heavens are heterogeneous, in 1623 he proposed that comets are luminous reflections of atmospheric exhalations, an account similar to the one he had proposed in 1606 and

similar to the Aristotelian account; quoting Galileo: "The substance of the comet ... may be believed to dissolve in a few days, and its shape, which is not circularly bounded but confused and indistinct, gives us an indication that its material is more tenuous than fog or smoke."²¹¹

Libertus Fromondus, author of a *Treatise on the Comet of 1618* and a *Commentary on the Meteorology*,²¹² understood Galileo's opinions about comets, but in book 3, *De Cometis*, of his 1627 *Meteorology*, he rejected them, arguing instead for the Anti-Aristotelian view that some comets are supralunar. In *De cometis*, Fromondus repeated the arguments from his shorter 1618 tract, with a few interesting changes. Fromondus' discussion is divided into four parts: on the place in which comets are generated, with arguments about parallax and whether comets are celestial or sublunary; on the matter of comets, whether they are drawn from celestial or from terrestrial and aqueous matter; on the formal, efficient, and final cause of comets, with a single article about whether comets presage events on earth; and on the properties of comets, including arguments about the tails of comets, their light, their motion, magnitude, and duration. Given that Fromondus is talking about comets generally, he argues (like Du Moulin after him) that some comets are celestial but also allows that some are sublunary. Thus there are two kinds of comets: those generated in the heavens, that share the motion and matter of the stars, and others that are sublunary and drawn from terrestrial elements.

Still, in his chapter on the location of comets, Fromondus is clear that many comets have a smaller degree of parallax than that of the moon; thus comets move among the stars.²¹³ This leads to his critique of the parallactic views of Scaliger, Rothmann, (p.92) Claramontius, and Galileo. In fact, Fromondus describes in detail the argument by Galileo and his disciple Guiducci against the use of parallax for measuring the distance of comets. As he explains it, positional visual phenomena such as parhelia, halos, and rainbows are to be located below the heavens next to us but evince no measurable degree of parallax. Comets, then, could have no measurable parallax and still be some kind of terrestrial exhalations in the sublunary region. Fromondus understands that this is the conclusion of Guiducci and Galileo, but rejects it. He notes that comets are not visual phenomena but lucid bodies like stars, and that they frequently move from place to place, from south to north and vice versa—that which a mere positional appearance could not do.²¹⁴ Fromondus revisits the opinion of Guiducci and Galileo that comets are terrestrial exhalations in his second chapter, on the matter of comets. Against their view, he repeats his analysis from his 1618 treatise that such exhalations climbing so high would become so rarified that they would become invisible.²¹⁵ Moreover, in his fourth chapter, on the motion of comets, Fromondus argues that terrestrial exhalations do not have the lengthy motions exhibited by comets; if Galileo and Guiducci were right, the proper motion of comets above the moon would measure only one or two degrees of arc for the whole of their duration.²¹⁶

Fromondus argues against Galileo and Guiducci on three separate occasions. On one of these occasions he singles out an argument as belonging to Guiducci alone, that the curvature of the comet's tail is caused by refraction. Fromondus dismisses this

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explanation, arguing that if this were so, the comet's tail would be more curved at the horizon, where greater and more vapors are in abundance, and asserting that such a phenomenon was not observed for the comet of 1618 or for earlier comets. Fromondus had obviously considered seriously Galileo's views and those of Guiducci—well enough to reject them, and well enough to be able to differentiate between them. Fromondus, like other seventeenth-century Scholastics, combined some forward-going elements with some traditional commitments. We should note the attempt at arguments based on observations and the conclusion that comets are supralunary objects in a commentary on the *Meteorology*, a book devoted to sublunary phenomena.

2.4. Metaphysics in Late Scholastic Textbooks

In the sections on logic (and physics), we sketched a progression in late Scholastic textbooks from actual commentaries on Aristotle's works, providing Aristotle's text and a formal apparatus of explanations and questions, to treatises based more loosely on Aristotle's works. With logic, the problem was that of making sense of different **(p.93)** works of Aristotle as one; this was accomplished first by assembling commentaries on Aristotle's *Organon* together in a traditional order within a single volume, and then by reconceiving the materials as a single treatise, unified according to a new schema. With metaphysics (as it was with ethics), even though textbook authors were dealing with just a single text, Aristotle's *Metaphysics*, the task was almost the same, in that the fourteen books of the *Metaphysics* seem to be a miscellany; the books appear to shift, almost haphazardly, from topic to topic.

A reason for thinking of a portion of the *Metaphysics* as unified comes from W. D. Ross, who argues that at least ten of the books "form a more or less continuous work."²¹⁷ According to Ross, to consider these ten books as cohesive is to think that Aristotle provides a historical introduction in book 1 (A) and a list of metaphysical puzzles in book 3 (B), which he proceeds to answer in the later books.²¹⁸ This still leaves four outlying books,²¹⁹ that were probably inserted in their locations by later editors. Even so, Ross warns that the "more or less continuous work" does not constitute "a complete work." One obvious reason for this caution is that Aristotle does not deal, in the later books, with all the problems raised as metaphysical puzzles in book 3 (B). It would be difficult to find a more compelling argument for the unity of Aristotle's *Metaphysics* but even this one does not seem to argue for sufficient conceptual coherence for all the parts of the work.

Thus the task of producing a metaphysics, like that of producing a logic, also became one of reconceptualizing some of the materials of the fourteen books of the *Metaphysics* into a single unified treatise, according to a new schema, if one could be found. Now, there were, of course, numerous commentaries on Aristotle's *Metaphysics*, from Aquinas' to those of Jesuits such as Petrus Fonseca, the initial leader of the Coimbrans; however, neither the Coimbran Jesuits nor Toletus composed a *Commentary on the Metaphysics*. It has been suggested that the Coimbrans did not write such a commentary because Fonseca produced his own; but Fonseca also produced two logic textbooks, *Institutionum dialecticarum* and *Isagoge philosophica*, and that did not prevent them from producing their own logic texts. Moreover, Fonseca's *Metaphysics* was published

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posthumously (1615–29), long after his death in 1599 (and after the Coimbrans produced their other commentaries). Still, when one looks at Fonseca's *Metaphysics*, one sees a model for what the Coimbrans might have accomplished, had **(p.94)** they attempted it. Fonseca's book contains a Greek critical text and a new Latin translation (both established by Fonseca himself), plus paraphrases (*explanationes*) and commentary (*quaestiones*). But the work was left incomplete; the commentary ends at book 9 and the paraphrases end at book 12. Books 13 and 14 give only Aristotle's text in two languages.

Aquinas' substantial commentary in two volumes also looks somewhat incomplete, since it treats only the first twelve books. However, Aquinas should have been able to finish his work, had he wanted to. It has been suggested that perhaps he did not have the full manuscript of the *Metaphysics* in Latin translation and that he did not know the final two books. But that is an unlikely hypothesis since there are references to books 13 and 14 at various places throughout his *Commentary*. More likely is the possibility that he thought it unnecessary to treat the materials of the last two books (which contain Aristotle's criticism of later Academic views about Ideas as numbers and extensions and are not properly a development of Aristotle's own metaphysical views).²²⁰

Francisco Suárez seems to have been the first to have published a comprehensive exposition of metaphysics, proceeding in a systematic fashion, and not just following Aristotle's exposition. According to the Suárez scholar and translator John Doyle, "In format, Suárez's Disputationes represented a radical departure from previous metaphysical treatises. Until its appearance, metaphysics had been explicitly treated either just incidentally in the form of Opuscula ..., such as Thomas' De ente et essentia ..., or in commentaries on the text of Aristotle. Both methods were clearly unsatisfactory, the one incomplete and the other shackled to the rambling obsolete order of Aristotle."²²¹ Suárez divided his treatise into two massive tomes containing fifty-four disputations. In the first volume, after discussing the nature, that is the object and utility, of metaphysics in the first disputation, he considers being in general, its properties and causes in the others: disputations 2–11 treat the transcendentals, that is being and its attributes, and disputations 12-27 the causes of being. In the second volume, Suárez "descends" to created beings: disputations 28-31 discuss the division of being into infinite and finite, disputations 32–8 the division of finite being into substance and accident, and disputations 39–53, the division of accidents into the nine highest genera. Disputation 54 treats real being versus being of reason.²²² The question remains whether this ambitious scheme became the pattern for textbooks in metaphysics. The answer has to be negative, for the most part, especially since there were other schemas propounded as comprehensive treatments.²²³

(**p.95**) There was a further problem with metaphysics, in that its subject matter appeared also to involve theology. The issue is raised in *Metaphysics*, book 6 (E), which talks about the division of the theoretical sciences into physics, mathematics, and theology. According to Aristotle (1026a), if there is anything eternal, immutable, and existing separately, it must be studied by a theoretical science which is prior to both physics and mathematics: physics deals with objects existing separately, but not

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immutably; some parts of mathematics deal with immutable objects, not existing separately. This theoretical science, then, would deal with objects existing separately and immutably. Aristotle specifies that such causes must be eternal, especially the causes of the divine as it appears to us. Thus, this first theoretical science, this highest science that must deal with the highest object, is identified with theology. There are further remarks on God or gods in book 12 (Λ), whose primary concern is that of establishing the existence of an eternal unmoved mover, a notion introduced in book 2 (α).

Scholastics, then, had to decide about the scope of metaphysics: does it also contain some or all of theology, and, if so, does it involve only natural theology or can it include some aspects of revealed theology as well? Initially the two subjects—metaphysics, theology were mostly kept apart; courses in metaphysics and theology were situated in different curricula and taught by different faculties; metaphysics was part of the philosophy curriculum, taught by the collegiate faculty of arts, and theology was part of the theology curriculum, taught by the graduate faculty of theology. Works in the two subjects, whether treatises, textbooks, or commentaries, were intended for different audiences. Aquinas, for example, wrote a Commentary on Aristotle's Metaphysics and separately a Summa Theologiae. The standard texts for the theology course in the medieval period consisted of commentaries on the Sentences of Peter Lombard, which provided a handy list of topics to be discussed and a particular order for discussing them. But, as the fashion for the commentary on the *Sentences* drew to a close, schemas for discussing theology were also multiplied. Toletus wrote a Commentary on Aquinas' Summa *Theologiae*²²⁴ and Suárez wrote numerous commentaries on the various parts of Aquinas' Summa. As could be expected, there developed a fair amount of overlap between the subject matters of the courses in metaphysics and those in theology, which is reflected in the textbooks written for such courses (naturally, there existed all along much commonality between metaphysics and theology).

Even Eustachius, whose Metaphysics (part 4 of his Summa Philosophiae Quadripartita) is a very short treatise, finds enough place in it to discuss the parts of being-that is, substance and accident, but also angels, and God and his attributes—along with the nature, principles, and properties of being. And this in spite of the fact that he published a massive Summa Theologiae Tripartita as well.²²⁵ After some preliminary questions about the (p.96) nature, object, and order of metaphysics, Eustachius' work is divided into four parts: (1) On the nature of being, with discussions of the concept of being, formal and objective being, being *per se* and *per accidens*, actual and potential being, and how being is predicated of God and creatures, and substance and accident. (2) On the principles of being, with arguments about essence and existence. (3) On the properties of being and such notions as one, true, and good, as well as the distinctions between necessary and contingent, the same and other, in act and in potency. (4) On the parts of being, whether created or uncreated, including substance and accident in general, intelligences, such as angels, and God, our knowledge of him, his existence, and his principal attributes. Although one can find other metaphysics textbooks, such as Arriaga's Metaphysical Disputations,²²⁶ in which the attempt is to construct a rational way of presenting the topics of Aristotle's *Metaphysics*, what textbook writers seem to have in

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common with Eustachius is that they begin their treatises with general metaphysics, or the nature, principles, and properties of being, and end with particular metaphysics; that is, a discussion of God and angels.²²⁷

In fact, this became the common pattern; while some textbook authors consider metaphysics as quadripartite, in the fashion of Eustachius and de Ceriziers, others formally bifurcate it. For example, Bouju divides his treatise into Universal Metaphysics, about being, its properties, and the parts of being (in this case, substance and accident, universal and particular, species and difference), and Particular Metaphysics, about God and angels. Goudin does the same. Goudin's Metaphysics (part 4 of his *Philosophia*) begins with a preliminary question on the divisions of metaphysics, which he says are two: "the first explains being in general and its universal notions; it is called **(p.97)** *Universal Metaphysics* or *Ontology*, that is, the science of being. The second, which discusses things that are separate from matter, that is, God, angels, and separated souls, is called *Particular Metaphysics* or *Natural Theology.*"²²⁸ Thus Goudin's treatise is divided into: (1) Being in General, with questions about the principles of being, being in itself, and the properties of being; and (2) Spiritual Being, with questions about God, angels, divine influx in secondary causes, and spiritual accidents. Goudin finishes his work with an appendix on being of reason.

Returning to Bouju, not only does he split his Metaphysics into two, but he places his Universal Metaphysics before his Physics and his Particular Metaphysics after it. According to Bouju, "Universal Metaphysics comes after Logic, because by treating what is common to all the other sciences, it is useful to enter into the matter in this way, so that, beginning with universal things, one does not have to repeat anything several times. ... The book of particular Metaphysics follows those of the Physics immediately after the book about the rational soul, because it treats the other immaterial substances, which are more excellent than the rational soul."²²⁹ One needs to stress this placing of at least one portion of metaphysics before physics and disabuse oneself of the notion that seventeenth-century Scholastics all thought that metaphysics comes after physics. Clearly, "metaphysics" literally does mean "after the Physics"; however, this was not Aristotle's title, but that of some Hellenistic editor "who assembled the treatise we know as Aristotle's *Metaphysics*." The title probably indicated the place these collected topics "were intended to occupy in the philosophical curriculum. They were to be studied after the treatises dealing with nature (*ta phusika*)."²³⁰ But, as I have indicated, textbooks in seventeenth-century metaphysics were no longer strictly tied to Aristotle's presentation or topics. The place of metaphysics in the philosophy curriculum was still frequently after the physics;²³¹ however, as Bouju showed, it does not need to have been so. And Bouju was not alone in this. Frassen also inverted the order of his Academic Philosophy, treating metaphysics second, after logic but before physics and ethics.²³² Frassen's order looks "Cartesian," although his reasons for placing metaphysics before physics are Scholastic and not Cartesian. He does not do so because he (p.98) thinks that metaphysics constitutes the foundations of physics,²³³ but because he thinks that there is an affinity between logic and metaphysics: metaphysics and logic "drink from the same stream" with respect to subsistence, inherence, truth, and the categories.²³⁴ Dupleix

makes the same point, even though he maintains a more or less traditional order of Logic, Physics, Metaphysics, and Ethics, in his *Cours de Philosophie*:

Logic is necessary to Metaphysics above all other sciences ... because of the conformity of their object. For, as even the Philosopher teaches, both Logic and Metaphysics consider being. That is why the ten predicaments or categories—in which all finite being is comprised, corporeal and incorporeal substance and the accidents—are treated in both Logic and Metaphysics; thus, whoever properly understands the categories will be already well advanced in Metaphysics. That is what constitutes the affinity between these two disciplines.²³⁵

So Metaphysics might be placed before Physics simply because it is best to treat universal things before particular ones and because it has an affinity with Logic. This latter rationale in particular is not one Descartes would have given, of course, since he does not consider logic as even an integral part of the tree of philosophy. For him, logic is preliminary to the study of true philosophy; at best it is a practical exercise for improving one's mind. Ironically, Scholastics agree in the propaedeutic and heuristic value of logic. In his *Metaphysics*, Aristotle has a number of discussions about the similarities and dissimilarities of logic and metaphysics. He says, in book 2, "we ought to be educated with regard to the method to be expected before we begin the actual study" (995a12). Aquinas comments on this passage as follows: "This is why a man should learn logic before any of the other sciences, because logic considers the general method of procedure in all the other sciences. Moreover, the method appropriate to the particular sciences should be considered at the beginning of these sciences."²³⁶ These sentiments lead Dupleix to Descartes-style pronouncements about logic: it is necessary to Metaphysics above all other sciences "because of this disposition and the aptitude it engenders in our minds, fortifying our natural abilities by precepts of good reasoning."²³⁷ Dupleix, "in imitation of Plato," who places the motto over the door of (p.99) the Academy, "Let no one enter who does not know geometry," decides to place at the head of all his philosophical works: "Let no one read these works if he does not know Logic."²³⁸

To conclude this section on the changing form and varieties of textbooks of metaphysics, we should briefly sketch the structure of Dupleix's *Metaphysics or Supernatural Science*; it is a massive work that in some ways does and does not fit the pattern of Eustachius et al. Dupleix's order is exactly the same as that of the dominant pattern, starting with general precepts and ending with a discussion of separated soul, created intelligences, such as good and bad angels, and ultimately God. The difference is that Dupleix devotes only a small proportion to his first part, on general precepts and devils, and God. Although he does not treat such standard Christian theological topics as the Trinity,²³⁹ the incarnation, and the resurrection, many of the topics Dupleix discusses (the fall of Lucifer, the names and number of angels, their hierarchies, etc.) seem to go well into the realm of theology, both natural and revealed. Dupleix himself, however, distinguishes between Christian theology and metaphysics. He says repeatedly that they are distinct in both their objects and their principles: "Metaphysics considers all being, finite and infinite,

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created and uncreated and uses only proofs and natural reasons, that is, such that human understanding can accept and understand them using only natural light. Christian theology is satisfied with one most worthy and most excellent object, which is uncreated and infinite, namely God, and it uses in its precepts no other principles or proofs than those that were revealed by God to men."²⁴⁰ Thus Dupleix, like the other textbook writers, allegedly separates metaphysics from revealed or Christian theology, but does not separate metaphysics or first philosophy from natural theology.

The Preliminary Questions

I have already treated some of the issues discussed in the preliminary questions, namely those concerning the parts and order of metaphysics, its names, and its separation from revealed theology. It remains to point out that textbook authors agree on the status of metaphysics as contemplative science or wisdom and, despite attempts to make it seem controversial, such as that of Eustachius, at least by the beginning of the seventeenth century, they also agree that the object of metaphysics is real being, common to God and creatures, and usually exclude being of reason or potential being from metaphysics proper:

Philosophers differ on this matter. Some maintain that the object of metaphysics is God, others that it is separate substances, others that it is substance in general, others that it is finite (or so (**p.100**) called "predicated") being. All these definitions are too narrow, as will appear. Others extend its scope too far, when they say that the object of metaphysics is being taken in the broadest sense, to include both real entities and entities of reason; yet a true and real science, especially the foremost and queen of all the sciences, does not consider such tenuous entities in themselves, only accidentally. So the standard view is far more plausible, namely that the complete object of metaphysics in itself (for our question is not about its partial or incidental object) is real being, complete and in itself, common to God and created things ...²⁴¹

The Nature, Principles, and Properties of Being

While trying to make sense of the disagreements between Thomists and Scotists in Chapter 1, I reviewed a fair number of metaphysical theses and reported on Goudin's, then Eustachius' views, along with those of a few others. Here I wish to revisit some of these doctrines about the nature, principles, and properties of being—specifically those concerning (1) univocal predication, (2) theory of distinctions, and (3) the principle of individuation—and expand upon these examples to include the opinions of the other textbook writers I have been discussing.

1. Scholastics assert that being is not predicated *univocally* of God and creatures: what we say about God is only by analogy to what we say about creatures. Goudin, for example, following Thomas Aquinas, argues at length that being is not said of God and creatures univocally, but analogically,²⁴² and that being is not univocal with respect to substance and accident.²⁴³ Scotus is Goudin's target in these arguments.²⁴⁴ Eustachius and the others agree with Thomas and Goudin, asserting that what is said about God and

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creatures is said analogically, not "synonymously."²⁴⁵ Dupleix talks about the perfections attributed to God as "metaphorical or analogical"²⁴⁶ and says that "we recognize such perfections in God only by an analogy and relation to created things,"²⁴⁷ although he does also say "there is no proportion between creatures and God."²⁴⁸ Bouju asserts that "while our soul is joined to our body, even though the soul is immaterial, we have a proper conception of just material things; our conception of immaterial things is only by analogy."²⁴⁹ De Ceriziers discusses the issue as follows:

If one recalls that the word univocal expresses a nature that equally participates in the things it signifies, no one will believe that being would be univocal, although common to God and his creation. It remains, then to know whether it is analogous for God and creatures by attribution (**p.101**) or by proportion. ... Being is analogous by attribution to God and his creation, for who does not see that God is first and of himself and that creatures are dependent on his power and his goodness. ... And since being in God is the source and principle of all other beings, which are in some way only copies of this primitive and original being, we must conclude that being belongs to other beings by an analogy of proportion.²⁵⁰

Even the Scotist Frassen only gives only weak support to univocity. He tells us that there are two views on this issue, that of Thomas, who holds for analogical predication of being between God and creatures, and that of Scotus, who holds for univocal predication. He then discusses four grades of univocity having to do with whether the basis for the univocation is equally between altogether perfect beings or whether it is between beings whose perfection is not equal. The fourth grade applies to God and creatures, substance and accident, as having a common basis. But God is independent and creatures are dependent and "the basis for being in God is most perfect, while it is not so in creatures. It therefore follows that the univocity of being is by analogy."²⁵¹ Frassen concludes that "being is univocal in the ultimate grade between God and creature, substance and accident, not, however, by a pure univocity, but by analogy."²⁵² There is a sense in which the debate is merely terminological. Except for a few steadfast Thomists, seventeenth-century textbook authors agree that being is univocal (or "common") between God and creatures, but that God and creatures do not participate in being equally, so that one can call this participation analogical by attribution or by proportion, as does de Ceriziers, or an impure analogical univocity, as does Frassen.

2. Scotus is also Goudin's target with respect to the distinction between essence and existence; according to Goudin, Scotus and most philosophers deny that essence and existence are really distinct, while St Thomas affirms it.²⁵³ The disagreements about this issue continue: De Ceriziers holds for a real distinction between essence and existence;²⁵⁴ Suárez, on the other hand, disputes the Thomist doctrine of a real distinction between essence and existence (calling it a distinction of reason with a basis in things) and between substance and accident.²⁵⁵ As we have seen, Goudin disputes Scotus' view that there is a third, formal distinction, operating before the operation of the intellect, and holding according to the nature of the thing, against the opinion of St Thomas, that in such cases "there is only one and the same entity conceived

diversely."²⁵⁶ Bouju agrees that "there are two kinds of distinctions according to which things can be distinguished among themselves. One is real and of fact and the other by consideration only. Philosophers call the distinction by consideration rational."²⁵⁷ He discusses the **(p.102)** possibility that there are distinctions "that are in actuality only by the understanding that conceives them, but have a foundation in the nature of things, such that one could say that they are halfway between a real distinction and a distinction of reason." He concludes nevertheless that "we must not understand this distinction to be anything other than of reason."²⁵⁸

On the other hand, like Scotus and against Thomas, Eustachius accepts a third distinction beyond real and rational.²⁵⁹ The Scotist Frassen, of course, devotes a whole section on the formal distinction.²⁶⁰ Dupleix also discusses the issue. He indicates that philosophers have always distinguished beings in two ways, between those really distinct and those distinct only by our reason, but "modern philosophers following Scotus have found that it is more useful for instruction to add a third kind which is, as it were, midway and participating between the two."²⁶¹ Dupleix approves of the third mixed distinction between real and of reason:

The mixed distinction, which is also called distinction according to the thing, is the one in which we conceive of things according to the nature or condition of the things themselves—that is, what is conceived in our understanding is nevertheless in conformity with the nature and condition of things. And thus this kind of distinction does not merely refer to things really distinct among themselves, according to the distinction of reason, but refers also to many other things that have no real distinction among themselves, even though we conceive one in them without our straying from their nature or condition. ... Scholastics also call this third kind of distinction with a rather meaningful phrase, *distinction of reason,* and the previous distinction *distinction of reasoning reason,* to show that the previous one depends only on the action of our understanding and discourse of our reason accommodates itself and is in conformity with the nature and condition of things.²⁶²

3. Goudin also defends the Thomist view about the numerical unity and multiplicity of substances.²⁶³ And he rejects Scotus' *haecceity* as the principle of individuation.²⁶⁴ Eustachius, in contrast, argues for the Scotist doctrine that a form, not "signate" matter, is the principle of individuation.²⁶⁵ Textbook authors often take this Scotist line. (p.103) For example, Dupleix discusses three main opinions about the principle of individuation, that of the Thomists, of the Scotists, and of another group he does not identify. He grants that the Thomists have the authority of Aristotle behind them, but argues that quantity cannot reveal "the proximate and true formal cause of the individuality and unity of the essence of singular things," since quantity is always an accident and accidents do not operate at the level of essences.²⁶⁶ Dupleix's preferred position is the Scotist one: "in order to establish the individual essence of Socrates, Alexander, Scipion, and other singular persons, we must necessarily add for each one of them an individual and

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singular essential difference which is so proper and so peculiar to each of them for themselves, that it makes each of them differ essentially from all the others."²⁶⁷ His third, anonymous group consists of those who base the principle of individuation on the "multitude of accidents," given that this multitude "is never found together in any other subject."²⁶⁸ Dupleix has no problem rejecting this opinion using the same argument he uses against the Thomists: accidents cannot be the principles of the essential constitution of substances.²⁶⁹

God, Angels, and Separated Souls

I continue the procedure from the previous section, enlarging upon the discussion in Chapter 1, although limiting it to a single general topic, namely the ontological (or a priori) argument and its preliminary questions, whether we can form a concept of God's essence in this life and whether God's existence necessarily follows from God's essence.

For Goudin, following Thomas, divine existence is neither intuited nor demonstrable a priori, but it is capable of demonstration a posteriori. One of the objections treated by Goudin involves knowledge of God and his attributes; he affirms, in good Thomist fashion, that we have only limited knowledge of God: "the knowledge we have of God is certain, but it does not penetrate perfectly to divine being nor to the manner in which this being is suitable for God; what we know is not much better than negation, insofar as we recognize in God a manner of being much more sublime than that of creatures."²⁷⁰ There is almost universal agreement in this. Bouju asserts that "with respect to the powers of their nature, humans are utterly incapable of knowing God's essence and what he is. ... Humans cannot form a proper conception of him, regarding **(p.104)** what he is We know God, but we do not comprehend him."²⁷¹ Similarly, Dupleix states that the essence of God cannot be conceived²⁷² and no a priori demonstration of his existence is possible.²⁷³ Even Frassen, following Scotus, argues that the existence of God is not demonstrable a priori.²⁷⁴

Eustachius seems to agree as well, but tries to make a bit more room for our being able to form concepts of God's essence in this life:

By means of the natural light we can even in this life have imperfect awareness of God, not merely of his existence but even of his essence. For by the power of natural inference we can infer that God is an infinite being, a substance that is uncreated, purest actuality, an absolutely primary cause, supremely good, most high and incomprehensible. All these things belong to God by his very essence and, indeed, uniquely, since they cannot belong to any other being. Hence, when I grasp in my mind an infinite or uncreated being, or some such, I fashion for myself a concept uniquely applicable to God, in virtue of which I have imperfect awareness of his essence. Hence, we can in this life form concepts of God that are unique and proper to him ...²⁷⁵

In his part 2, on essence and existence, Eustachius also defends the proposition that God's essence cannot be conceived except as existing, that it is a contradiction that God should not exist:

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Existence belongs to God and to created things, but with a difference. For God exists not through existence being added to his nature, but through his very essence (just as quantity is said to be extended though itself). But this is not true of created things, since their existence is accidental to their essence. Hence existence is essential to God, so that it is a contradiction that he should not exist, but existence is not essential to created things, which can either exist or not exist. Hence the divine nature cannot be conceived except as actually existing; for if it were conceived as not actually existing, there would be something missing in its perfection, which is quite inconsistent with its actual infinity. But the formal or essential concept of a created thing is distinct from its existence²⁷⁶

Still, in Thomist fashion, however, he denies that we can demonstrate God's existence a priori, since God is not *per se nota* to us, and proposes instead the five Thomist a posteriori demonstrations.²⁷⁷

De Ceriziers goes a step further than Eustachius, in that he seems to accept an ontological argument. De Ceriziers, like Eustachius, thinks that we can form a concept of God's essence and God's existence follows from his essence: "The being of God is infinite even in this objective concept that is present to our mind when we form the thought of his essence; therefore he excludes no perfection; otherwise God's being would not be an infinite nature in contrast with created natures." He adds that "since **(p.105)** essence is nothing other than the possibility of being, ... we cannot doubt that existence is not of the essence of God, since God is the necessary and the first of all beings."²⁷⁸ He then derives the existence of God from this:

We can derive an invincible proof of God's truth from this reasoning. For if, out of all creatures, there are none that are not contingent, meaning that could have not been, then they have all been possible before being existent, if they have been possible; therefore there has been an infinite nature whose existence was necessary, in which the virtue of producing them resided as in its natural principle. The contingent being supposes the necessary—strong proof of divinity.²⁷⁹

To sum up, there is, surprisingly, a fair amount of agreement about metaphysics in School books. Almost all of them begin their treatises with general metaphysics—that is, the nature, principles, and properties of being—and end with particular metaphysics; that is, a discussion of God and angels (and at times also separated souls). They all agree on the status of metaphysics as contemplative science and the object of metaphysics as real being, common to God and creatures; and they usually exclude being of reason from metaphysics proper. They also think that what is said about God and creatures is said analogically, not univocally. They are split, however, about whether there is a third distinction between real and of reason. Almost all of them abandon the Thomist principle of individuation and most accept soul or an individuating form as that principle. Moreover, they are generally in agreement about whether one can form a concept of God's essence in this life, but even those who think that one can form such a concept (or have imperfect awareness of it) usually deny an a priori proof for God's existence.

Notes:

(1) AT iii. 184–5.

(2) AT iii. 185.

(3) AT iii. 232.

(4) AT iii. 251.

(5) AT iii. 233. Descartes considered publishing his project in Latin and calling it *Summa Philosophiae*; he said to Huygens: "Perhaps these Scholastic wars will cause my *Le Monde* to be brought into the world. I believe it would be out already, were it not that I would want first to teach it to speak Latin. I would call it *Summa Philosophiae*, so that it would be more easily introduced into the conversation of the people of the Schools, ministers as well as Jesuits, who are now persecuting it and trying to smother it before its birth" (AT iii. 523).

(6) AT iii. 259. About a month later, when Descartes was deep into the project, having just completed the first part of the *Principles*; he said: "I would be pleased to have as few distractions as possible, at least this year, since I have resolved to write my philosophy in such an order that it could easily be taught. And the first part, which I am now writing, contains almost the same things as the *Meditations* you have, except that it is written in a different style, and that what is written about at length in the one is abbreviated in the other, and vice versa" (AT iii. 276).

(7) AT iii. 286. Descartes had previously indicated that he only wanted to do the project "with the writings of a living person and with his permission, which it seems to me I would easily obtain when my intention, to consider the one I chose as the best of all who have written on philosophy, will be known" (AT iii. 234). But he added: "I have completely lost the intent to refute this philosophy; for I see that it is so absolutely destroyed by the establishment of mine alone that there is no need of another refutation" (AT iii. 470).

(8) "As for you, worthy Sir, since I see you embarking on the correct path of reforming and improving philosophy for use in the Schools, so that the youth are not infected with objectionable principles ... I would suggest you compose a philosophical summary, such as Eustachius a Sancto Paulo once prepared: it will serve as a textbook for those attending your theology lectures, and when published will some day reach the rest of the world." Leibniz 1875–90, ii. 294–5.

(9) The first book on such issues as "The usefulness of logic," "How logic can be called science," "How logic can be called art," and "Concerning the definition and division of logic," and the second on the subject matter discussed in Porphyry's *Isagoge*, such as genus, species, accidents, and universals. Dupleix thinks of Porphyry's *Isagoge* as an introduction to Aristotle's categories: "In as much as there are certain, often reiterated words in Aristotle's *Categories* that concern the art and are not elucidated by the author, before coming to these, one needs to expose and explicate five of these words,

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namely, *genus*, *species*, *difference*, [essential] *property*, and *accident*, the exposition of which we borrow in imitation of others, such as Porphyry, who has composed a handsome and fine introduction on Aristotle's *Categories*" (Dupleix 1984 [1603], 62).

(10) These volumes came out between 1592 and 1606. They were originally led by Petrus de Fonseca who published his own *Dialectical Institutions* (1564) and *Commentary on Aristotle's Metaphysics* (1577–89). Ultimately, they were directed by Manuel de Gois, who oversaw the publication of the full curriculum of commentaries: *Physics* (1592), *On the Heavens, Meteorology, Short Treatises on Nature*, and *Ethics* (1593), *On Generation and Corruption* (1597), *On the Soul* (1598), and *Dialectics* (1606).

(11) Having to do with the various arts and sciences; whether logic is a science; what is its subject; and whether it is necessary for the other disciplines.

(12) The *Dialectics* provide only the first fourteen chapters and ch. 28 of *Prior Analytics*.

(13) The *Dialectics* provide only chs. 1–13, 27–9, and 33 from *Posterior Analytics*, part I.

(14) "Ne in Topicorum, et Elenchorum labyrinthos Lectorem induceremus, summam compendiosè texere constituimus, et curiosos earum fabricarum aucupes mittere ad introductionem D. Petri Fonsecae è nostra Societate, cuius doctrinam, seu primam lac Dialecticae suis studiosis haec instillat Academia." See also the end of the commentary on the *Topics*, i.e. Conimbricences 1606, ii. 749, where the authors justify the omission of the remainder of Aristotle's text and its interpretation again by referring to Fonseca's *Dialectical Institutions*.

(15) Having to do with whether dialectics is necessary for all the other sciences; whether it is a science, a single science, a speculative or practical science; what is its subject and its object.

(16) In Gilbertus Porretanus' *Six Principles* the ten Aristotelian categories are divided into two classes; namely, forms inhering in the subject, i.e. substance, quantity, quality, and relation (see Toletus 1572, ch. 1, De forma, fos. 98–9) and the subordinate remaining six, i.e. action, passion, when, where, position, and habit (see chs. 2–7, De actione, De passione, De quando, De ubi, De positione, De habitu, fos. 99–102).

(17) Toletus also has another short logic text, *Introductio in universam Aristotelis logicam* (93 pp.), in which he treats some of the materials from the *Prior Analytics*, the *Topics*, and *Sophistical Refutations*. Unlike his larger logic text, it is not a commentary. The work is divided into five chapters: (1) Terms; (2) Supposition; (3) Enunciations; (4) Syllogisms; (5) Topics and Fallacies.

(18) Additamenta ad commentaria D. Francisci Toleti in Logicam Aristotelis. Praeludia in libros Priores Analyticos; Tractatus de Syllogismo; de Instrumenti sciendi; et de Praecognitionibus, atque Praecognitis (1597). One gathers that the Additions were written much earlier, since Carbone indicates in his Preface to the Reader that he had been saving them in the hopes of producing a complete logic himself, but that he is making

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them available to others, lest they never see the light of day. The *Additamenta* play an interesting historical role in the so-called "continuity thesis," i.e. in the transmission of medieval theories to the early modern period, influencing such innovators as Galileo. See Wallace 1984.

(19) De Raconis did likewise, but gave paraphrases along with the *quaestiones*. There are plenty of variations, of course. Pierre du Moulin's *Philosophy* (1644) was tripartite—logic, physics, and ethics—while the *Philosophy* (1648) of Léonard Marandé added a fifth part, theology. Dupleix's *Corps de Philosophie* (1627) added discussions of the short treatises on the causes of sleep and dreams separately from those dealing with the *Physics*, and supplemented his volumes with separate work on natural curiosities, arranged in alphabetical order. Théophraste Bouju, in his *Corps de Toute la Philosophie* (1614), broke up metaphysics into two parts, one before and one after his physics, and added separate works on economics and politics.

(20) To see more concretely the pattern of change, let us take just one example from among a myriad of possible ones. Aristotle's *Categories*, ch. 1, concerns homonymous, synonymous, and paronymous names. The Coimbrans (1606) begin with a summary of Aristotle's chapter, plus the text itself and a commentary on it. Their first question deals with equivocation and is divided into four articles, while their second question treats univocity in two articles. (Toletus proceeds in a similar fashion in his Logic.) Dupleix's Logic, book 3, On the Categories, ch. 2, which is titled "Of Homonyms, Synonyms, and Paronyms," omits the Aristotelian text and commentary, and gives a standard discussion in the form of a treatise, while Eustachius' Summa, part I, Dialectics or Logic, without the Aristotelian text to structure the discussion, transforms the materials into a dissertation about the operations of the mind. The first operation concerns simple apprehension and deals with the material treated by Aristotle's *Categories*. Thus, question 1 is "What are terms in Dialectics?" and question 4 is, "What and in what ways are terms univocal, equivocal, and analogous?" (Eustachius 1629 [1609], i. 14–19). These also become the subject matter of part I of Bouju's Philosophy, Dialectics or Logic, book 1, In Which the Elements or Principles of Argumentation are Treated; they are no longer treated as guestions but, in the same fashion as Dupleix, as topics within chapters: ch. 3 is titled "Of Terms," and chs. 9–13, "Of univocal or synonymous nouns," "Of equivocal or homonymous nouns," and "Of analogous nouns." (Bouju 1614, livre 1, pp. 30-1 and 35-6; you can find the same kind of arrangement in Pierre Gautruche's 1656 Institutio Logicae). Eustachius, Bouju, et al. are no longer directly commenting on Aristotle's works, but writing conceptually coherent treatises that make reference to Aristotle's works.

(21) E.g. Bouju 1614, ch. 12, on "Des noms equivoques ou homonymes," is headed by excerpts from the *Categories* and *Metaphysics*, while ch. 13, on "Des noms analogues," starts with quotations from the *Physics, On Generation and Corruption, Metaphysics*, and *Magna Moralia*. The verso to the title-page indicates that "Les textes Grecs-Latins d'Aristote, qui font à la teste de quelques Chapitres et articles de cet œuvre, n'interrompent point le François, car il va tout de suitte, sans y estre astraint, ayans esté

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mis seulement pour les raisons portées en la page 23." Bouju seems embarrassed by quotations in Greek and Latin, given that he is writing a textbook in French (i.e. for those who were not educated in the Schools). His defense on pp. 23–4 is spirited; here are two points from the general discussion: "Mais neantmoins j'ay voulu rapporter grand nombre de textes d'Aristote en teste des chapitres de cet œuvre, pris de divers endroicts de ses escrits sur chaque matière que je traicte, pour luy faire dire par ses propres paroles, en l'ordre que je les rapporte de divers lieux, sa doctrine plus clairement beaucoup, que quand ces passages sont separez les uns des autres, comme ils se trouvent en ses livres. ... Et dautant que si je ne rapportois son texte en la langue qu'il l'a escrit, quelqu'un pourroit doubter si la version Latine seroit bonne."

(22) Eustachius 1629 [1609], Prima Pars Dialecticae, De iis quae ad primam mentis operationem spectant, I, p. 12.

(23) That is also the arrangement of the *Logic* (1677) of the Scotist Claudius Frassen. After the standard preliminary questions, Part I begins with a prelude on the operations of the mind, which are three: simple apprehension (*apprehensio simplex*), judgment (*judicium*), and discourse (*discursus*). In fact, Frassen also argues that method is not a fourth operation of the mind and that the three operations are indeed distinct (pp. 91-93). In keeping with this conception, Frassen's *Logic* is tripartite.

(24) Gautruche 1655, p. 46.

(25) Not all logic textbooks fit these patterns. The *Logic* of Pierre du Moulin, a French Protestant, which had some influence in England, having been translated twice into English, has a more traditional structure, with a few twists. Du Moulin's first book treats single conceptions. According to Du Moulin, "all the conceptions of man, are either *single*, or *composed*. Single Conceptions are those, which are expressed with one word. ... Composed Conceptions are those, which are expressed by an Enunciation, or proposition. ... Of many propositions joined together, is made an argument, or Syllogisme" (Du Moulin 1647, 1–2). Du Moulin's second book treats, out of order, the places of invention. The third book is about Enunciation; the fourth Syllogism; the fifth Demonstration; and the sixth Sophisms or Fallacies.

(26) Later on Dupleix talks of there being two parts of logic, the first called analytic and the second dialectics or topics: "Analysis teaches what is demonstration, meaning, discoursing and reasoning by necessary principles ... Dialectics or topics shows how to discourse and reason by merely probable and likely principles, from which one can properly conclude opinion or even certainty, but not science, which is certain knowledge of the thing through its cause" (Dupleix 1984 [1603], 57–8).

(27) Dupleix 1984 [1603], 29.

(28) Dupleix 1984 [1603], 32.

(29) Dupleix 1984 [1603], 49.

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(30) De Ceriziers 1643, 4.

(31) Another opinion about the formal object of logic is the nominalist one, that words are the object of science. But, as Goudin indicates in opposition to this, "the sciences, in fact, do not treat words, but the things signified by them. ... It is clear that medicine does not treat the word illness, but the thing that the word signifies" (1726 [1668], i. 101; 1864, i. 217).

(32) "quia ens est duplex: ens scilicet rationis et ens naturae. Ens autem rationis dicitur proprie de illis intentionibus, quas ratio adinvenit in rebus consideratis; sicut intentio generis, speciei et similium, quae quidem non inveniuntur in rerum natura, sed considerationem rationis consequuntur. Et huiusmodi, scilicet ens rationis, est proprie subiectum logicae." *Sententia Metaphysicae*, lib. 4, lect. 4 n. 5. When Goudin quotes this text, he inserts *secundis* as a modifier of *intentionibus*, so that the point would not be lost: "Ens autem rationis dicitur proprie de illis secundis intentionibus" (Goudin 1726 [1668], i. 103; 1864, i. 219).

(33) Dupleix 1984 [1603], 45.

(34) Dupleix 1984 [1603], 46-7.

(35) Dupleix 1984 [1603], 54.

(36) See e.g. Christopher Clavius in ACS 24-8.

(37) Goudin 1726 [1668], i. 112; 1864, i. 234.

(38) Frassen 1668, pars 1, pp. 91-2.

(39) Du Moulin 1647, 1–2.

(40) Eustachius 1629 [1609], i. 14. ACS 71.

(41) Eustachius 1629 [1609], i. 46. ACS 72.

(42) Eustachius 1629 [1609], i. 19–21.

(43) De Ceriziers 1643, 10. Eustachius gives *omnis*, *nullus*, and *aliquis* as three examples of syncategorematic terms and *res*, *ens*, *unum*, *bonum*, *aliquid*, and *verum* as his transcendentals, 1629 [1609], i. 20.

(44) Goudin 1726 [1668], i. 134–5; 1864, i. 272–3.

(45) Frassen 1668, pars 1, pp. 130-1.

(46) De Ceriziers 1643, 12. Goudin 1726 [1668], i. 135–140; 1864, i. 273–81. There is a brief chapter in Dupleix about universals, in the general style of Porphyry's (three) questions: 1. Whether the universal has its being from itself or by means of singular

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things? 2. Whether the universal is pure invention, imagination, and conception of our understanding? 3. Whether the universal is in singular things or really separate from them? 4. Whether the universal is corporeal or incorporeal? Dupleix answers these questions in a broadly Scotistic manner 1984 [1603], 87–98.

(47) E.g. Dupleix 1984 [1603], 165-6.

(48) Du Moulin 1647, 95–8. Dupleix 1984 [1603], 177–82. Bouju 1614, 43–4. Eustachius 1629 [1609], 101–3.

(49) Du Moulin 1647, 98–100. Dupleix 1984 [1603], 183–94. Bouju 1614, 43–4. Eustachius 1629 [1609], 103–4.

(50) Eustachius 1629 [1609], 104.

(51) Dupleix 1984 [1603], 195-8, 199-200.

(52) Bouju 1614, 48-54.

(53) Conimbricenses 1606, ii, cols. 174–98; Toletus 1572, fos. 120–6. It is not that future contingents were not appealing in the seventeenth cent. Questions about future contingents and especially questions about the Christian form of the issue, whether God's knowledge of the future is incompatible with man's freedom, are given significant discussion in the debates between Jesuits such as Luis de Molina and more conservative Thomists, such as Domingo Bañez. These discussions, however, moved from the realm of logic to that of theology.

(54) Goudin 1726 [1668], i. 264–79; 1864, i. 486–509.

(55) Eustachius 1629 [1609], i. 96; ACS 75.

(56) Eustachius 1629 [1609], i. 107; ACS 75. This is actually the first of three cases, the first being: in which we compare the object of inquiry among themselves. The second is: in which we compare the means used to explain those objects; it also follows an order: "when there are many means to prove a given result, those which are closer to the thing to be proved should be dealt with in an earlier place, and those which are more remote in a later place." The third case is: when we compare the means with the objects of inquiry, and "the order to be observed here is designed to ensure that the prior means correspond with the prior objects of inquiry, and the posterior means with the objects which are posterior."

(57) Eustachius 1629 [1609], i. 107–8.

(58) Dupleix 1984 [1603], 269-70; ACS 99.

(59) Goudin 1726 [1668], i. 96; 1864, i. 207.

(60) Goudin 1726 [1668], i. 96; 1864, i. 207–8.

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(61) For Goudin's three rules of analysis and fives rules of synthesis, see 1726 [1668], i. 97–100; 1864, i. 210–13.

(62) Goudin 1726 [1668], i. 97; 1864, i. 208–9. Goudin's discourse on method broadly reminds one of Descartes' rules of method from *Discourse*, part II. Given that Goudin publishes after Descartes and has read him and criticized him, it is possible that he was influenced by him. However, much of what Goudin says is also continuous with discussions of method in Scholastic textbooks, such as that of Eustachius.

(63) Du Moulin 1647, 103.

(64) Du Moulin 1647, 105–6. The first figure occurs when the middle term, i.e. the repeated term in the two premises of a syllogism, is the subject of the proposition (meaning, the first premise) and of the attribute in the assumption (meaning, the second premise)—as e.g. the way the term "man" is presented in the following syllogism: "every man is a sinner," "Paul is a man"; "therefore, Paul is a sinner." With the second figure, the middle term is the attribute in both premises; and with the third figure, the middle term is the subject in both premises.

(65) Barbara, Celarent, Darii, Ferio, / Cesare, Camestres, Festino, Baroco, / Darapti, Felapton, Disamis, / Datisi, Bocardo, Ferison. Du Moulin 1647, 119. There is a quantity of disparate information encoded in the verses, the most important of which is that the first line stands for the first figure (four forms), the second for the second figure (four forms), and the rest for the third figure (six forms). The vowels (a, e, i, o) in the names stand, respectively, for affirmative universal, negative universal, particular affirmative, and particular negative propositions. Felapton, for instance, being on the third line, is a third figure syllogism in which the middle term is the subject of both premises, the first premise is a universal negative (e), the second a universal affirmative (a), and the conclusion a particular negative (o) enunciation. Du Moulin gives as an example of Felapton: "no bat has feathers," "every bat flies"; "therefore, something that flies has no feathers." These are time-honored pedagogical techniques for teaching syllogism. Dupleix, Eustachius, Goudin, and Bouju produce a slightly different mnemonic verse: "Barbara, Celarent, Darii, Ferio, Baralipton, / Celantes, Dabitis, Fapesmo, Frisesomorum, / Cesare, Camestres, Festino, Baroco, Darapti, / Felapton, Disamis, Datisi, Bocardo, Ferison." The difference between the two schemes is that for the latter mnemonic, the first two lines are the first figure (nine forms), the third line to Baroco is the second figure (four forms), and the rest are the third figure (six forms). The five extra valid syllogisms are cases where equivalent conclusions can be arrived at by conversion or by subalternation. For example, Celarent and Celantes are both e-a-e syllogisms, the difference being that Celarent is exemplified by "no man is a rock," "every man is animal"; "therefore, no man is a rock." Given that the conclusion "no man is a rock" is convertible to "no rock is a man," we can also have Celantes, which is equivalent to a Celarent: i.e., "no man is a rock," "every man is animal"; "therefore, no rock is a man." There is a similar relation between Darii and Dabitis (both a-i-i syllogisms). Baralipton is a case where the subalternate of the conclusion is given: instead of a-a-a (Barbara), we have a-a-i. (Bouju 1614, 57–9. Dupleix 1984 [1603], 205–27. Eustachius 1629 [1609], i. 123–7.)

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(66) Bouju 1614, 76.

(67) Eustachius 1629 [1609], i. 133.

(68) Dupleix 1984 [1603], 277.

(69) Dupleix 1984 [1603], 267-8.

(70) Dupleix 1984 [1603], 281-2.

(71) Eustachius devotes just six pages to each: Eustachius 1629 [1609], i. 142–8 and 148–53. Goudin produces two short articles: Goudin 1726 [1668], i. 89–94 and 94–6.

(72) Bouju 1614, whose full title is Corps de toute la philosophie divisé en deux parties. La premiere contient tout ce qui appartient à la Sapience, à savoir, la Logique, la Physique, et la Metaphysique. La Seconde contient tout ce qui appartient à la Prudence: à savoir, la Morale, l'Oeconomique et la Politique. Le tout par demonstration et auctorité d'Aristote, avec eclaircissement de sa doctrine par luy-mesme. Bouju's Morale takes up 238 pp., his Oeconomique 30 pp., and his Politique 207 pp.

(73) E.g. both Dupleix and Bouju cite the *Magna Moralia*; Bouju also frequently cites the *Eudemian Ethics*.

(74) See Jill Kray in Garber and Ayers 1997, 1281–2.

(75) Aquinas 1949; 1964, para. 1953: "After the Philosopher has finished the consideration of the moral and intellectual virtues—and of continence and friendship which have a relation to virtue—in the tenth book he intends to consider the end of virtue. First, concerning the end of virtue that perfects man in himself; then ... the good of the whole state."

(76) Aquinas 1949; 1964, para. 245: "After the Philosopher has treated the questions introductory to virtue, he now begins the study of the virtues. He divides the treatise into two parts. In the first part he treats the virtues themselves. In the second he examines certain things that follow or accompany the virtues. He does this in the seventh book ... The first part is subdivided into two sections. In the first he studies the moral virtues; in the second the intellectual virtues, in the sixth book."

(77) Aquinas 1949; 1964, para. 528: "After Aristotle has finished the treatise on virtues in general, he begins here a particularized study of the individual virtues. First he treats the virtues concerned with the interior passions. Next, he treats justice and injustice (concerned with external actions) in the fifth book."

(78) Aquinas 1949; 1964, para. 1292. "After the Philosopher has defined the moral and intellectual virtues, he now begins to consider certain things that follow from them. First he treats continence, which is something imperfect in the genus of virtue. Next ... he

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treats friendship, which is a particular effect of virtue. Finally \ldots he treats the end of virtue."

(79) E.g. Jill Kray in Garber and Ayers 1997, 1283.

(80) Aquinas 1964–76, II/I, q. 4.

(81) Aquinas 1964–76, II/I, q. 62.

(82) Aquinas 1964–76, II/I, q. 61.

(83) Gautruche's structure is almost identical to that of Eustachius, except that he divides Eustachius' part III into two further parts, yielding a part III on Human Passions and a part IV on Moral Virtues. Goudin achieves the same schema by collapsing the first three Coimbran books into one, on Happiness, and their last two books into another single book, on Moral Virtues in Particular (meaning again the four cardinal virtues). This results in treatises composed of six books, ordered in the same fashion as the nine books of the Coimbrans.

(84) Barbay does so as well, with a few variations. He thinks of his work as tripartite and the standard pattern as setting out the Principles of Human Action. Thus he writes treatises on the end or aim of human actions, with disputations on the good, the end, and happiness. After this, treatises on moral powers follow, with disputations on will, appetite, and freedom. Part I ends with treatises on moral virtues, with disputations on habits, moral virtues in general, and moral virtues in particular—the latter discussing prudence, justice, fortitude, and temperance. There is not much new here, except that, in addition to the Principles of Human Actions, Barbay discusses, in his part II, the Properties of Human Action—properties such as voluntary and involuntary, good and evil—and, in his part III, the Species of Human Actions, i.e. passions in general and in particular. Thus, he rearranges some of the materials within a newer schema, keeping a fair amount of the older structure intact. Even the Scotist Claude Frassen (1668) follows the Coimbran model, with a few exceptions. He starts with the nature of human action, with disputations about its principles, in three groups: (1) the good, the end, and happiness; (2) intellect, appetite, and will; (3) conscience, law, and habit. He continues with the species of human actions, such as the virtues in general and in particular, the latter being the usual four. And he ends his discussion with a third part on good and evil, vices, sins, and passions.

(85) De Ceriziers 1643, 80.

(86) Dupleix (1993 [1610]) divides his work into seven books: (1) The object of morality, its end, its divisions. The good in general. (2) Various opinions about the supreme good.
(3) Moral virtue. Voluntary actions, deliberation, choice. (4) Particular moral virtues. Justice, right, equity. (5) Other moral virtues: courage, temperance, liberality, magnificence, magnanimity, truth, etc. (6) Intellectual virtues: wisdom, intelligence, knowledge, prudence, and art. (7) Heroic and divine virtues: obedience, continence and patience; friendship; love; charity and good will.

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Bouju (1614) divides his work into eight books: (1) Man's happiness. (2) Prudence, moral virtue in general. (3) Particular moral virtues (that are more for one's own good than for that of others): Temperance, honesty, continence, etc. (4) Particular moral virtues (for the good of others as well as for one's good): Courage, liberality, magnificence, etc. (5) Justice and equity. (6) Friendship, good will. (7) Elucidations about the topics in the previous six books. (8) On the means for acquiring the habit of moral virtue.

(87) Du Moulin himself is unusual insofar as he is the only Protestant in our group of Scholastic textbook authors; he is also one of our authors to have had a portion of their corpus translated into English (his *Logic*, twice; Dupleix's *Natural Curiosity* is translated into English, as are Sennert's two works on the natural sciences). Perhaps Du Moulin's doctrinal variations can be expected as part of his confessional differences.

(88) Du Moulin 1643, 139-40.

(89) Although Du Moulin also inserts a short chapter at the beginning of book 1 on The Parts, Order, and the end of Moral Science (Du Moulin 1643, 42–9).

(90) Goudin quotes Aquinas from *Summa*, II/I, q. 58, art. 5 (Aquinas 1964–76): "right reason demands principles from which reason proceeds to argue. And when reason argues about particular cases, it needs not only universal but also particular principles. As to universal principles of action, man is rightly disposed by the natural understanding of principles, whereby he understands that he should do no evil; or again by some practical science. But this is not enough in order that man may reason aright about particular cases. For it happens sometimes that the aforesaid universal principle, known by means of understanding or science, is destroyed in a particular case by a passion: thus to one who is swayed by concupiscence, when he is overcome thereby, the object of his desire seems good, although it is opposed to the universal judgment of his reason. Consequently, as by the habit of natural understanding or of science, man is made to be rightly disposed in regard to the universal principles of action."

(91) Goudin 1726 [1668], iii. 4–5; 1864, iii. 6–8.

(92) Goudin 1726 [1668], iii. 3; 1864, iii. 5.

(93) Eustachius 1629 [1609], ii. 1. ACS 77–8. See also Bouju 1614, 4–5.

(94) Dupleix 1993 [1610], 69-70.

(95) Dupleix 1993 [1610], 55–6. There are two Scholastics named Francesco Piccolomini. Dupleix is referring to the Aristotelian professor from the University of Padua (1520– 1604), author of *Universa philosophia de moribus* (Venice, 1583), and not to the Collegio Romano professor (1582–1651), who was briefly Superior of the Jesuits before his death.

(96) Dupleix 1993 [1610], 57–8, with the conclusion as quoted on p. 58.

(97) Jill Kraye, who asserts that for the ethics textbook writers, "Aristotle was, of course,

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the primary authority, followed closely by Thomas Aquinas," also notes that "some authors occasionally (and very cautiously) disagreed with Thomas; Eustachius 1654, pp. 49–50; Dupleix 1610, pp. 31–32." Kraye in Garber and Ayers 1997, 1284 and 1310.

(98) Kraye rightly states: "Classical philosophers apart from Aristotle, when not brought in simply to be disagreed with, as they commonly were, tended to play an ancillary role in support of the major authorities." One of the notes to this statement asserts: "Barbay 1680, pp. 104–8, discusses the Stoic and Platonic views of happiness in order to dismiss them in favor of the Peripatetic position; Dupleix 1610, pp. 163–85 and 374–81, does the same for Stoic and Platonic views of the supreme good and of moral virtues; the Stoic belief that all passions were morally evil was regularly used in this way: Eustachius 1654, p. 82; ... Barbay 1680, pp. 407–12." Kraye in Garber and Ayers 1997, 1284 and 1310.

(99) De Ceriziers 1643, iv. 108.

(100) De Ceriziers 1643, iv. 110.

(101) De Ceriziers 1643, iv. 118.

(102) De Ceriziers 1643, iv. 124. The Scotist Frassen holds a broadly comparable view to the one held by de Ceriziers. He also divides beatitude into natural and supernatural, perfect and imperfect (Frassen 1668, pars 4, pp. 39–42), and distinguishes between objective and formal beatitude (pp. 42–3). But he argues against the philosophers, including Aristotle, that objective beatitude does not consist in a good soul or in its habits, nor in the goods of the body, or honor, etc. (pp. 43–55). Objective human beatitude resides in God alone, who is the object of that beatitude (pp. 55–7). Formal human beatitude consists in the contemplation of God and more principally, in the love of God (pp. 57–62).

(103) Bouju 1614, Morale, 6.

(104) Bouju 1614, Morale, 9–12.

(105) Bouju 1614, *Morale*, 12–19 and 26–34. On pp. 19–26, Bouju discusses the opinion he attributes to Eudoxus that happiness resides in pleasure (*volupté*). He details the Platonists' criticisms of that opinion and Aristotle's rejection of the Platonists' criticisms together with Aristotle's own rejection of the opinion, which Bouju approves.

(106) Bouju 1614, Morale, 34–9.

(107) Bouju draws a contrast between the Aristotelian about bodily good as that of the Stoics, who viewed happiness abstractly and who held that only human virtue was sufficient for being happy, even in the midst of torments (1614, *Morale*, 42–4).

(108) Bouju 1614, Morale, 39-47.

(109) According to Dupleix, for Aristotle, "the supreme good or human felicity is activity

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of the soul in conformity to virtue in a perfect life" (Dupleix 1993 [1610], 131), Piccolomini's addition being that this is to be understood for both the active and the contemplative life (pp. 135–8).

(110) Du Moulin 1643, 48-9.

(111) Du Moulin 1643, 51–2.

(112) Goudin 1726 [1668], iii, quaest. 1, art. 1, pp. 8–16.

(113) Goudin 1726 [1668], iii, quaest. 1, art. 2, pp. 16–32. Cf. Eustachius 1629 [1609], ii. 14–15.

(114) Goudin 1726 [1668], iii, quaest. 1, art. 3, pp. 32–56. Cf. Eustachius 1629 [1609], ii. 16–18. See also Conimbricenses (1593), 26–8.

(115) Dupleix also lists the same five intellectual virtues and considers but rejects others, such as subtlety of mind or *ingenium* (1993 [1610], 349). Du Moulin also lists the same five intellectual virtues (1643, 235).

(116) Goudin 1726 [1668], iii, quaest. 3, art. 1, p. 93.

(117) Du Moulin 1643, 72.

(118) Eustachius 1629 [1609], ii. 9. ACS 78.

(119) Eustachius 1629 [1609], ii. 20–1. ACS 78–9.

(120) Dupleix 1993 [1610], 231-4.

(121) Dupleix 1993 [1610], 235–6. See also book 7, pp. 413–90. Dupleix calls charity "a liberality ordered by Christian law," p. 235.

(122) Parts of this section on Scholastics physics are inevitably abbreviated versions of various chapters of Ariew 1999a, 2011.

(123) Conimbricences 1986 [1592], 1597, 1593a, 1593b, 1598a, 1593d; Toletus 1598, 1575, 1615 [1574].

(124) Toletus 1589, Prolegomenon, cap. 3, fo. 6^b.

(125) The *Physics* in Bouju 1614 is slightly different from the others. It divides its subject matter into what is initially described as nineteen books, but actually contains a twentieth and twenty-first book. The discussion begins as usual with (1) Principles of Natural Things, but continues with (2) The First Simple Body, the Heaven and (3) Other Simple Bodies, the Elements. Bouju then returns to the topics of Aristotle's *Physics*, with books (4) on Time and (5) on Place and Void. He discusses some materials from *On Generation* in (6) The Production of Things in General and continues with the *Physics* topic of (7)

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Motion. Book 8 concerns Simple Generation. Book 9 is an unusual chapter about Ancients on the Principles and Causes of Natural Things. But Bouju then resumes with the usual order of (10) Mixed Bodies and (11) Meteors, from the *Meteorology*, and continues with a series of books (12–21) with the various topics of the *De anima*.

(126) Dupleix 1990 [1603], 71.

(127) Eustachius a Sancto Paulo 1629 [1609], quaest. prooeminales, quaest. III: Quis ordo sit servandus in tractanda hac philosophiae parte, p. 5.

(128) Eustachius continues by enumerating the animate bodies of the *De Anima* and *Parva naturalia*, then the books on plants and the history, generation, and parts of animals.

(129) The traditional order continues well into the second half of the seventeenth cent., as can be seen in Goudin 1668. After some Preliminary Questions, Goudin's quadripartite *Physics* is conceived of as: (1) Mobile Being in General; (2) Being subject to Local Motion;
(3) Being formed by Generation; and (4) Being endowed with Vital Motion. See also Frassen 1668, which, like Goudin 1668, also discusses Descartes' philosophy—very negatively for the most part. Frassen's *Physics* is tripartite and resembles Eustachius' *Physics* in its organization: (1) Intrinsic and Extrinsic Principles; (2) Properties of Natural Bodies; and (3) Species of Natural Bodies.

(130) Dupleix 1990 [1603], 89-90.

(131) Eustachius 1629 [1609], iii, Preliminary questions, question 2, p. 112. ACS 80-1.

(132) Dupleix 1990 [1603], 93-7.

(133) Eustachius 1629 [1609], iii, Preliminary questions, question 1, pp. 110–11.

(134) Eustachius 1629 [1609], iii, Preliminary questions, question 1, p. 112.

(135) Dupleix, 1990 [1603], 129. For more on matter and form, see Ariew 1999a, 2011, ch. 4.

(136) See Toletus 1589, iii, ch. 1, text. 3.

(137) E.g. Dupleix 1990 [1603], iii, ch. 4, p. 187.

(138) Toletus 1589, iii, ch. 3, quaest. 1.

(139) See also Dupleix 1990 [1603], iii, chs. 1–15, pp. 173–228; Sennert 1618, i, ch. 8, pp. 23–9 (1659, i, ch. 9, pp. 43–6).

(140) See de Raconis 1651, 247–8.

(141) See e.g. Dupleix 1990 [1603], book 2, ch. 2; Eustachius 1629 [1609], iii.1.2, quaest.

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6–7. See also Sennert 1659, book 1, ch. 3.

(142) Dupleix 1990 [1603], 131.

(143) Dupleix 1990 [1603], 132.

(144) Dupleix 1990 [1603], 130.

(145) Goudin 1726 [1668], ii, quaest. II, art 4, p. 77.

(146) Dupleix 1990 [1603], p. 135. See also Dupleix's discussion of individuation in his *Metaphysics* 1992 [1610], 231–2. Eustachius a Sancto Paulo agrees with Dupleix (see my Ch. 1). In his bachelor's thesis at Leipzig, *Disputatio Metaphysica de Principio Individui*, Leibniz numbers Eustachius a Sancto Paulo among the Scotists, holding *haecceity* as the principle of individuation (Leibniz, 1923–, vi/1.16–18, §§20–5).

(147) Bouju 1614, i. 297–8 (ch. 113: De la cause exemplaire). For more on exemplary causation and the Scholastic notion of idea, see Ariew 1999a, 2011, ch. 3.

(148) Bouju 1614, i. 297–8.

(149) Aquinas 1964–76, i, quaest. 15, art. 3 (Aquinas 1945, 166). See also art. 1 (Aquinas 1945, 161–2).

(150) Bouju 1614, i. 177 (ch. 13: Que la verité des choses ne nous est point connue par leur rapport aux idées qui sont en l'entendement de Dieu).

(151) Eustachius a Sancto Paulo 1629 [1609], *Physica*, pars 3, tract. 2, disp. 1, quaest. 3: Quid sit exemplar, & ad quod genus cause revocandum sit, p. 138. See also de Raconis 1651, 94–8.

(152) A list of the syncategorematic terms would normally include: every, whole, both, of every sort, no, nothing, neither, but, alone, only, is, not, necessarily, contingently, begins, ceases, if, unless, but that, and infinitely many. For more on seventeenth-cent. Scholastic discussion of infinity and continuity, see Ariew 1999a, 2011, ch. 8.

(153) See e.g. Bouju 1614, i. 275–8 (ch. 86: De l'estant finy et de l'infiny).

(154) Toletus 1589, iii, quaest. 5–7, fo. 100, col. a, to fo. 103, col. d.

(155) Toletus 1589, fo. 103, col. a.

(156) Conimbricenses 1592, *Physics*, i, cols. 509–40, esp. col. 524.

(157) Abra de Raconis 1651, pars 3, p. 194.

(158) Eustachius 1629 [1609], *Physics*, tract. 3, quaest. 5, Quid et quotuplex sit infinitum, p. 152.

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(159) "If you object that it follows that if one has to posit an actual infinity in nature, it would follow that either one can divide a continuum into infinite parts or those parts in the continuum would not be actually infinite, we reply, *infinity in act* can be conceived in two ways: one, properly speaking, in which all the parts are actually separated and distinct from one another, which is called categorematic infinite; the other in truth, improperly speaking, whose parts are not actually separated from one another, but are said to be communicating with one another, in which the smaller are contained in the larger, which is called syncategorematic infinite. Thus a continuum can be divided to infinity and it does not follow that we have to hold an actual infinity, properly speaking, but only an infinite in act in the second way, improperly speaking. From this it is to be understood that all parts of the continuum are actually in the continuum, not however actually infinite categorematically and properly, but syncategorematically and improperly." Eustachius 1629 [1609], *Physics*, tract. 3, quaest. 4, An continuum sit divisible in infinitum, pp. 151–2.

(160) Eustachius 1629 [1609], *Physics*, tract. 3, quaest. 5, p. 152.

(161) Eustachius 1629 [1609], *Physics*, tract. 3, quaest. 6, p. 153. ACS 82-3.

(162) Eustachius 1629 [1609], *Physics*, tract. 3, quaest. 7, An detur aut falsum dari possit infinitum, pp. 153–4.

(163) Dupleix 1990 [1603], pp. 287–91; de Ceriziers 1643, p. 116.

(164) For more on seventeenth-century Scholastic discussions of place, time, and void, see Ariew 1999a, 2010, chs. 2 and 8, and Edwards 2013.

(165) Aristotle 1910–52, *Physics*, 4.5 (212b 12–14).

(166) Aquinas 1953, iv, lectio 7. Aquinas also rejected Averroes' popular solution to the same problem, that the ultimate sphere is lodged because of its center, which is fixed. Aquinas 1953, iv, lectio 8. Averroes' view thus requires the immobility of the earth and Aquinas' does not, though it does require the immobility of the universe as a whole.

(167) Duns Scotus 1639, *Quaestiones in librum II Sententiarum*, dist. 2, quaest. 6.

(168) Duns Scotus 1639, *Quaestiones Quodlibetales*, quaest. 12.

(169) Toletus 1589, iv, quaest. 5: An locus sit immobilis, fos. 120^{r} – 121^{r} . Cf. Du Moulin 1644, ch. 9.

(170) Bouju 1614, i. 458–9 (ch. 7: Comment le ciel et la terre sont en lieu, et peuvent estre dits se mouvoir de mouvement de lieu); see also i. 460 (ch. 9: Que le lieu naturel est immobile).

(171) Eustachius 1629 [1609], *Physica*, tract. 3, 2nd disp., quaest. 1, Quid sit locus, pp. 56–8.

(172) Eustachius 1629 [1609], *Physica*, iv, tract. 2, sect. 3, pp. 205–6.

(173) Eustachius 1629 [1609], *Physica*, tract. 3, 2nd disp., quaest. 2, Quotuplex sit locus, pp. 58–9.

(174) The distinction between external and internal place (or space) can also be found in Toletus and the Coimbrans.

(175) *Physica*, iv, tract. 2, sects. 1–2, pp. 204–5.

(176) In his article on the void, Eustachius further clarified his notion of imaginary space above the heavens by asserting that it is not a vacuum, properly speaking; Eustachius 1629 [1609], *Physica*, tract. 2, 2nd disp., quaest. 5, An motus in vacuo fieri possit, p. 61. See also Leijenhorst 1996.

(177) De Ceriziers, 1643, Métaphysique, pp. 86-90.

(178) Dupleix 1990 [1603], 149-50.

(179) Dupleix 1990 [1603], 153.

(180) Gautruche 1665, ii. 331. See also Frassen 1668, pars 3, p. 357.

(181) Barbay 1675–6, pp. 261–72; Vincent 1660–71, ii. 847–925.

(182) Goudin 1726 [1668], ii. 310–11.

(183) E.g. de Ceriziers 1643, ii. 94–5.

(184) De Ceriziers 1643, ii. 96.

(185) *Physics*, 215b 21–2. Aristotle also argued that the void is impossible, if it is thought to be a place with nothing in it; that is, a location actually existing apart from any occupying body (*Physics*, 4.6–7).

(186) Toletus 1589, iv, quaest. 9. Eustachius a Sancto Paulo agreed, calling motion in the void extremely probable (1629 [1609], *Physica*, tract. III, 2nd disp., quaest. 4–5).

(187) Dupleix 1992 [1610], iv, ch. 10.

(188) De Ceriziers 1643, ii. 97–8. See also with Marandé 1642, 251–5.

(189) "Quod tempus non sit motus neque sit sine motu," Aquinas 1953, iv, lectio 16, and "quod tempus sequitur motum," lectio 17.

(190) Scotus 1639, Quaestiones Quodlibetales, quaest. 11.

(191) Toletus 1589, iv, quaest. 12: An tempus sit numerus motus secundum prius, & posterius, fos. 142^{v} – 143^{v} .

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(192) Eustachius 1629 [1609], *Physics*, tract. 3, quaest. 2: Quomodo distinguatur tempus a motu, pp. 63–4. See also Marandé 1642, 257: "Le temps imaginaire est celuy que nous figurons auparavant la creation."

(193) Dupleix 1990 [1603], 299-303.

(194) De Ceriziers 1643, ii. 100. The same distinction is made in Marandé 1642, 256.

(195) De Ceriziers 1643, ii. 102–3.

(196) E.g. see Frassen 1668 (quoting Scotus), pars 3, pp. 400–2, and Goudin 1726 [1668] (quoting Thomas), ii. 296–308.

(197) One interesting seventeenth-cent. Scholastic development that should be mentioned is the theory of *minima naturalia*, a kind of Scholastic corpuscularian bridge to alchemical theories; this is generally discussed as part of *On Generation and Corruption*. One can find it in numerous textbooks, as e.g. Toletus 1589, i, ch. 4, quaest. 10–11; Sennert 1618, i, ch. 5, pp. 15–16 (1659, i, ch. 5, pp. 27–9); de Raconis 1651, 370–7. For more on this topic, see Ariew 2011, ch. 5.

(198) Eustachius a Sancto Paulo 1629 [1609], ii. 96.

(199) See e.g. Gaukroger 2008, 99, 171. The "crystal" spheres are a rhetorical move by Tycho. Aristotelians accepted solid spheres for the epicycles and eccentrics of their planetary heavens. A crystal sphere is traditionally postulated as the ninth sphere, above the firmament of fixed stars, representing the biblical water above the firmament. Tycho could have no argument that places his comet above the firmament, crashing through the crystal sphere; rather his argument would be that the lack of measurable parallax of the comet would place it above the sphere of the moon, whose parallax is measurable.

(200) Dupleix 1990 [1603], 423-4.

(201) For more on Regiomontanus' measurements, see Jervis 1985.

(202) "The fire of which the comets are enflamed and of which they burn is slow and moderate; comets are not raised up on account of the weight of their matter, but they move from east to west in accordance with the motion of heaven, although they do not do so with regularity. The height of their motion is less than that of the planets and other stars; it demonstrates that they remain in the middle region of the air, in the same way as do those lights in the form of stars which seem to fall from heaven, which are only meteors, of the nature of comets, and not true stars, being generated and corrupted almost in the same instant." Bouju 1614, i. 600–1 (i. Phys. 11, ch. 12: Des Comettes).

(203) Bouju 1614, i. 381.

(204) De Ceriziers 1643, 363-4.

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(205) Du Moulin 1644, iv, ch. 3, pp. 103–4.

(206) Du Moulin 1644, iv, ch. 3, p. 104.

(207) Goudin 1726 [1668], iii. 197.

(208) Goudin 1726 [1668], iii. 43.

(209) Goudin 1726 [1668], iii. 41. For an excellent discussion of the Scholastic treatment of animate bodies, see Des Chene 2000, 2001.

(210) Galileo, *Il saggiatore*, in Galileo 1960, 186–7. Galileo is quoting from a debate between his student Mario Guidicci and Grassi, and supporting Guiducci against Grassi.

(211) Galileo 1960, 229.

(212) Fromondus (1587–1653) was professor of philosophy and theology at the University in Louvain. Fromondus was educated with the Jesuits and studied philosophy at Louvain; he returned to Louvain, where he taught rhetoric and then philosophy while pursuing scientific interests that led to the publication of several treatises (including Fromondus 1670a, 1670b). In the 1620s he resumed his studies in theology under Cornelius Jansen (with whom he would remain closely associated) and obtained a doctorate in theology in 1628. When Jansenius was appointed bishop of Ypres in 1636, Fromondus assumed his chair as professor of sacred scripture. During his final illness in 1638, Jansenius entrusted the manuscript of his *Augustinus* to Fromondus, who arranged for its publication in 1640.

(213) Fromondus 1670b, ch. 1, art. 1: Cometa quidam caelestes sunt, ex minima quorundam parallaxi, p. 100. Note that Fromondus discusses comets in his *Meteorology*, in their traditional place in the School's curriculum, even though he thinks of them as celestial and thus a subject to be discussed in *De Caelo*.

(214) Fromondus 1670b, ch. 1, art. 2: Argumentum Parallaxeos frustra eludunt Scaliger, Claramontius, Galilaeus, pp. 103–4.

(215) Fromondus 1670b, ch. 2, art. 4: Non omnium caeestium Cometarum materiam, esse terrestres halitus, pp. 126–9.

(216) Fromondus 1670b, ch. 4, art. 4: De Motu Cometarum, pp. 155-6.

(217) Aristotle 1924, p. xxiii.

(218) Books 4 (Γ), 6–9 (E, Z, H, Θ), 13–14 (M, N), and 10 (I).

(219) Books 2 (α), 5 (Δ), 11 (K), and 12 (Λ). Book 2, about the absurdity of an infinite causal series and the need for a first cause which is not itself caused, was, according to Ross, "introductory to a course not on metaphysics but on physics" (Aristotle 1924, p. xxv); Aquinas calls it The Search for Truth and Causes. Book 5 is a Philosophical Lexicon

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containing a list of words such as cause, element, nature, necessary, one and many, being, and substance. Book 11 consists of two distinct parts, the first containing briefer versions of chs. 3, 4, and 6, and the second extracts from *Physics*, 2, 3, and 5 (Aquinas: Recapitulation on the Nature and Subject of Metaphysics. Motion). According to Ross, book 12, which, like book 2, refers to no other books of the *Metaphysics*, "must be considered an entirely independent treatise, with one principal aim, that of establishing the existence of an eternal unmoved mover of the world." Aristotle 1924, p. xxix. (Aquinas calls it Mobile and Immobile Substance. The Prime Mover.)

(220) See the Translator's Introduction (in Aquinas 1961), sect. 3, The Problem of the Last Books.

(221) Suárez 1995, 8-9.

(222) In this I am following Alfred Freddoso's outline of the *Disputations*, Suárez 1994, pp. xvi–xvii. See also Suárez 1998, i, Ad Lectorem, par. 3. Doyle suggests that the two parts in the two volumes are "in effect dividing metaphysics itself into a general and a special part," Suárez 2004, p. xii. There is a sense to that remark, but, as we shall see, special metaphysics was thought to have a broader range. For many seventeenth-cent. Scholastics, general or universal metaphysics treated "ontology," or the science of being; special or particular metaphysics (or natural theology) treated God, angels, and separated souls.

(223) Not even Suárez's fellow Jesuit, Arriaga, could be said to follow Suárez's pattern in his own identically titled *Disputationes Metaphysicae* (part 3 of his *Cursus Philosophicus*, 1632).

(224) The commentary was published in four vols. during the nineteenth cent. (Toletus 1869–70). It consists of a partial commentary on the *Summa Theologiae* of Thomas Aquinas. Vol. i addresses most of the first sixty-four questions (out of 119) of the First Part; vol. ii, the first eighty-eight (out of 189) of the second part of the Second Part; and vols. iii and iv, the ninety questions of the Third Part.

(225) Eustachius a Sancto Paulo 1613–16. Despite the title proclaiming three parts, I know of only two parts in two vols. (The copy at the Bibliothèque Nationale has only two vols.; Scholasticon.fr mentions a copy at the Universidad Complutense Madrid, but it also is listed as two vols.) Eustachius enumerates the three parts as "Prima pars, de Deo increato tum secundum se ut Uno ac Trino, cum in ordine ad Creaturas seu ut Creatore ubi etiam de creatura praesertim rationali, Angelo nempe et homine. Secunda pars, de Deo incarnato seu Christo Redemptore ac Mediatore, ubi de ipsius Lege ac legis praevaricatione seu de peccatis. Tertia pars, de Mediis supernaturalibus tum internis cum externis quibus rationalis creatura per Christum justificantem ad Deum glorificantem revertutir: Cui subjungitur Appendix de Novissimus" (i, p. i). And, indeed, in the first two books, Eustachius discusses the many interesting topics he announces. Treatise 1 of Part I, on God's attributes, contains disputations about the existence of God, his simplicity, perfection, goodness, infinity, immutability, eternity, unity, together with how we know

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him, and his will, love, justice, pity, providence, etc. Treatise 2 is on the Trinity, Treatise 3 is about God as creator, and 4 concerns angels. Treatise 5 is about creatures that are partly corporeal and partly spiritual; that is, humans, both in their state of innocence and in their lapsed state. Treatise 1 of Part II concerns the Incarnation, Treatise 2 is about Christ's life and death, and 3 concerns Christ's Glory, his Resurrection, and Ascension. Treatise 4 is about laws, both natural and divine, and Treatise 5 concludes with a discussion of vices and sins.

(226) Arriaga's text is divided into six disputations: (1) Being and attributes; (2) Essence and existence; (3) Of the division of being into ten predicaments; (4) Substance; (5) The other predicaments; and (6) Being of reason.

(227) This pattern is followed by de Ceriziers, as well as Bouju, Goudin, Frassen, and Dupleix, whom I will discuss later. De Ceriziers' four parts of metaphysics are identical to those of Eustachius: (1) On the Nature of Being; (2) Of the Principles of Being, including essence and existence, subsistence, and inherence; (3) Of the Properties of Being, about unity, truth, goodness and such complex properties as necessity and contingency. De Ceriziers closes with (4) On the Parts of Being, about substance and accident, intelligences, and God (the last involving such topics as whether God can be known, that God's existence is of his essence, and the simplicity and immensity of this essence). Part 4 also contains a digression on the powder of sympathy and a discussion of imaginary spaces and divine perfections.

(228) Goudin 1726 [1668], iv. 185.

(229) Bouju 1614, "Sommaire de ce qui est contenu en ce corps de toute la philosophie."

(230) Cohen 2009, expressing widely held views.

(231) Eustachius, Dupleix, de Ceriziers, Goudin, and Arriaga all place their Metaphysics after their Physics, but follow different patterns overall: Eustachius: Logic, Ethics, Physics, Metaphysics; Dupleix and de Ceriziers: Logic, Physics, Metaphysics, Ethics; Goudin: Logic, Physics, Ethics, Metaphysics; Arriaga: Logic, Physics, Metaphysics.

(232) Structurally, in other respects, Frassen's work resembles that of Eustachius and the others. After a preliminary question about the nature, dignity, and object of being, the treatise is divided into three parts: (1) The Nature of Being: whether the concept is unitary; whether being is predicated univocally of God and creatures, substance and accidents; and principles of being, such as "it is impossible to be and not to be at the same time," with Descartes' *cogito* called "inane." (2) Properties of Being: discussion of the properties of incomplex being, such as the transcendentals and complex being, such as identity and distinction; of the formal distinction; of necessity and contingency, of existence. (3) The More Noble Species of Being: concerning the names of God; whether God's existence is demonstrable; God's wisdom, predestination and foreknowledge; God's will and Providence; ending with a discussion of angels and devils.

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(233) Versions of this "Cartesian" reason are also available in late Scholasticism. Discussing the primary functions of metaphysics, Eustachius says that they determine the subjects of the other sciences and supply the lower sciences their terms and their essential attributes. He adds, "Its third function is to establish the principles of the other sciences, and to provide especial guidance in matters that may cause trouble, by the assumption of certain very evident principles. ... It may be understood from this that all the other sciences come under metaphysics and are in some way subordinate to it," Eustachius 1629 [1609], iv. 3–4. ACS 92–3. See also Lüthy 2012, ch. 2. Dupleix, however, rejects the subalternation of the sciences to metaphysics, calling it "improper and conditional," Dupleix 1992 [1610], 100.

(234) Frassen 1668, pars 2, p. 1.

(235) Dupleix 1992 [1610], 104. Dupleix continues with some notable differences between logic and metaphysics.

(236) Aquinas 1961, book 2, lesson 5. See also book 3, lesson 1: "Averroes gives another reason [for Aristotle's procedure]. He says that Aristotle proceeds in this way because of the relationship of this science [metaphysics] to logic, which will be touched on below in Book IV; and therefore he made dialectical discussion a principal part of this science."

(237) Dupleix 1992 [1610], 104.

(238) Dupleix 1992 [1610], 103.

(239) Except incidentally, as when he affirms that pagans have known the one God and that some have even known the persons of the Trinity (Dupleix 1992 [1610], 695–702).

(240) Dupleix 1992 [1610], 95. See also pp. 89–93.

(241) Eustachius 1629 [1609], iv. 2. ACS 92 (see Eustachius, pp. 1–2, for metaphysics being a science). See also Dupleix 1992 [1610], 86–90; Frassen 1677, pars 2, pp. 2–9; Goudin 1726 [1668], iv. 183–5. Bouju and de Ceriziers (1614, 161–172; 1643, 11–15) seem to fit Eustachius' description of those who extend the scope of metaphysics too far, although it is difficult to assert this with confidence, since all textbook writers discuss real versus potential or rational being "accidentally." At least Dupleix and Eustachius assert plainly that rational being is not an object of metaphysics and Goudin goes so far as to treat it separately in an appendix.

(242) Goudin 1726 [1668], Metaphysica, quaest. 2, art. 2, p. 200.

(243) Goudin 1726 [1668], Metaphysica, 203.

(244) Goudin 1726 [1668], Metaphysica, 200.

(245) Eustachius 1629 [1609], Metaphysica, 15. Suárez 1998, disp. 28, sect. 3, no. 2.

(246) Dupleix 1992 [1610], 745.

(247) Dupleix 1992 [1610], 765. See also p. 767.

(248) Dupleix 1992 [1610], 706.

(249) Bouju 1614, 912.

(250) De Ceriziers 1643, iii. 6-7.

(251) "quia ratio entis in Deo est perfectissima, in creatura vero non sic: ex quibus pariter sequitur univocationem entis esse analogam." Frassen 1668, pars 2, pp. 17–18.

(252) "Ens est univocum ultimo gradu univocationis ad Deum et creaturas ad substantiam et accidens; non quidem unicocum purum, sed analogicum." Frassen 1668, pars 2, p. 18.

(253) Goudin 1726 [1668], Metaphysica, p. 208.

(254) De Ceriziers 1643, iii. 15–18.

(255) Suárez 1998, disp. 31, sect. 1, no. 3.

(256) Goudin 1726 [1668], Metaphysica, quaest. 3, art. 2, p. 224; see also p. 226.

(257) Bouju 1614, 161.

(258) Bouju 1614, 165.

(259) Eustachius 1629 [1609], *Metaphysica*, pars 3, disp. 3, quaest. 5–8, pp. 52–5. De Raconis similarly argues for real, formal and modal, and rational distinctions in the context of debates between Thomas and Scotus (1651, *Metaphysica*, 81–4). Suárez also argues against Thomas for a third distinction other than real and rational, although he rejects the Scotist formal distinction as vague and substitutes instead what he calls a modal distinction (1998, disp. 7, sect. 1, no. 16).

(260) Frassen 1668, pars 2, quaest. 3, pp. 385–91; see also the discussion of real distinction versus distinction of reason, pp. 383–5.

(261) Dupleix 1992 [1610], 246.

(262) Dupleix 1992 [1610], 247-8.

(263) Goudin 1726 [1668], Metaphysica, quaest. 3, art. 1, p. 219.

(264) Goudin 1726 [1668], Metaphysica, 221.

(265) Eustachius 1629 [1609], Metaphysica, tractatus de proprietatibus entis, disp. 2, quaest. 4, pp. 38–9. See also de Raconis 1651, *Metaphysica*, tract. 4, sect. 2, 4, brevis

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appendix, pp. 76–8. Even Toletus disagrees with Thomas about the real distinction between essence and existence and quantified matter as the principle of individuation (as well as God's being able to conserve matter without form and bodies being in two places simultaneously). Toletus 1869–70, iv. 200–1, 215–22, 240–1, 243–6, 255–8 (all having to do with the Eucharist).

(266) Dupleix 1992 [1610], 233.

(267) Dupleix 1992 [1610], 235.

(268) Dupleix 1992 [1610], 232.

(269) De Ceriziers rejects the views of those who accept "a real difference that determines the thing's particular nature, in the way Rational restricts animal to the species of man," and those who "think that the principle of individuation is nothing more than the concourse and multitude of the accidents that befall the substantial being of the individual." He is unusual in that he opts for what is called "double negation," usually a throw-away option; 1643, iii. 31. This view is dismissed by Scotus, who thinks of it as things not being individual through something positive and intrinsic: that the term one "only expresses the privation of division in itself and the privation of identity with another." Scotus 1639, *Ordinatio* 2, dist. 3, quaest. 2, *Opera Omnia*, i. Suárez is also unusual in that he argues, against both Thomas and Scotus (1998, disp. 5, sect. 6, no. 15), that the principle of individuation is matter and form (1998, disp. 5, sect. 2, nos. 8–9).

(270) Goudin 1726 [1668], Metaphysica, 207.

(271) Bouju 1614, 912–13.

(272) Dupleix 1992 [1610], 760.

(273) Dupleix 1992 [1610], 762.

(274) Frassen 1668, pars 2, pp. 87-90.

(275) Eustachius 1629 [1609], Metaphysica, pars 4, disp. 3, quaest. 1, p. 57. ACS 96.

(276) Eustachius 1629 [1609], Metaphysica, pars 2, disp. 2, quaest. 4, p. 21. ACS 95-6.

(277) Eustachius 1629 [1609], *Metaphysica*, pars 4, disp. 3, quaest. 2, Utrum Deum esse, demonstrari potest; et Quomodo, pp. 73–4.

(278) De Ceriziers 1643, iii. 50–1. The chapter is entitled: Que l'Existence de Dieu est de son essence.

(279) De Ceriziers 1643, iii. 56.

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Descartes and the First Cartesians

Roger Ariew

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The Tree of Philosophy

Descartes on Logic, Metaphysics, Physics, and Ethics

Roger Ariew

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[-] Abstract and Keywords

For Descartes a person "should above all try to form for himself a code of morals sufficient to regulate the actions of his life." After that, he should also study logic and practice for a long time with some easy and simple questions, such as mathematical ones. This is all a prelude to applying oneself to true philosophy, which Descartes likens to a tree "whose roots are metaphysics, whose trunk is physics, and whose branches, which issue from this trunk, are all the other sciences. These reduce themselves to three principal ones, namely, medicine, mechanics, and morals." So Descartes' order of self-instruction is first the formulation of a code of morals, then the study and practice of logic, followed by the study of metaphysics, physics, and the ultimate moral science. This chapter discusses Descartes' views in that order, although it groups Descartes' two morals together into a single section.

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Keywords: Descartes on logic, Descartes' metaphysics, Descartes' physics, Descartes' code of morals, Descartes' ultimate moral science

Descartes wrote a new preface for the French translation of the *Principles*. There he famously asserted that "philosophy as a whole is like a tree." What is sometimes overlooked is that, just before the image of philosophy as a tree, Descartes was discussing the order we should follow in one's self-instruction: a person who has merely imperfect knowledge "should above all try to form for himself a code of morals sufficient to regulate the actions of his life, because this does not permit any delay, and we ought above all other things to endeavor to live well."¹ After that, Descartes said we should also study logic and practice it as a mental exercise for a long time with some easy and simple questions, such as mathematical ones. This was all a prelude to applying oneself to true philosophy, which Descartes then likened to the tree "whose roots are metaphysics, whose trunk is physics, and whose branches, which issue from this trunk, are all the other sciences. These reduce themselves to three principal ones, namely, medicine, mechanics, and morals-by morals I mean the highest and most perfect moral science which, presupposing a complete knowledge of the other sciences, is the ultimate degree of wisdom."² So Descartes' order of self-instruction was first the formulation of a code of morals, then the study and practice of logic, followed by the study of metaphysics, physics, and the ultimate moral science (plus medicine and mechanics). I would like to discuss Descartes' views in that order, except that I will be grouping Descartes' two ethics or morals together into a single section (at the end of the series); I will not be discussing medicine or mechanics, although these are also worthy subjects.

But first I wish to deny that the tree of philosophy is a peculiarly Cartesian image to be associated with the Cartesian unity of knowledge (as discussed in Rule 1 of the *Regulae*) and contrasted with the Scholastic diversity of the sciences (from the same (p.107) rule).³ In fact, the image of the tree is itself a standard Scholastic trope; it is very likely that Descartes simply borrowed it from the very Scholastic textbooks it is supposed to contrast with, and did so for the same purposes. In the opening section of his Summa, part 3 (Physica), titled "Arbor Physicae (Tree of Physics)," Abra de Raconis compared the whole of physics to a tree whose roots are the first principles and causes of natural body, whose bark is the accidents of natural body (quantity, infinity, place, void, time, and motion), whose trunk is the world, and whose branches are the heavens, the elements, and mixed bodies (subdivisions of these branches being called twigs).⁴ In fact, the whole of de Raconis' *Physics* is arranged in accordance with the metaphor. For example, the title of the disputation on the heavens is "Rami Physicae Arboris, Ramus Supremus, seu Coelum et Sphaera" (Branches of the Tree of Physics, the First Branch, or Heaven and the Sphere) and that of the disputation on the elements is "Ramus Secumdus [sic] Physicae Arboris, seu Elementa" (The Second Branch of the Tree of Physics, or the Elements).

3.1. Descartes' Logic

Descartes was not a fan of Scholastic logic. He shared the standard Renaissance complaint about it, that basically formal logic, meaning syllogism, is useless; it may even be harmful. For example, we see Pierre de la Ramée (Ramus) argue in his *Dialectics* (1555) that only method, not dialectics, can usefully order known precepts:

Let us suppose that all the definitions, distributions, and rules of grammar are discovered and each correctly judged, and that all of these teachings are written on different tablets, which are thrown together and jumbled up out of order and put in a jug, as in the game of blank. What branch of dialectic could teach me to deal with such confused precepts and restore them to **(p.108)** order? No method of discovery is necessary, for everything is already discovered. Every particular proposition is judged and proved. We will need neither the first judgments of propositions nor the consequences of syllogisms. Method alone is left as a reliable way of putting things together.⁵

In his *New Organon* (1620), Francis Bacon echoes Ramus' sentiment that only method this time, induction—is worthwhile: "The syllogism consists of propositions, propositions consist of words, words are symbols of notions. Therefore if the notions themselves (which is the root of the matter) are confused and over-hastily abstracted from the facts, there can be no firmness in the superstructure. Our only hope therefore lies in a true induction."⁶ Similarly, Francisco Sanchez, in *Quod nihil scitur* (1581), attacks the barrenness of conventional uses of the syllogism and the emptiness of elaborate definitions. On standard accounts, knowledge is a disposition acquired by demonstration, but Sanchez says he does not understand what a disposition is and, worst of all, demonstration amounts to explaining something obscure by something even more obscure: "How subtle, how long, and how difficult is the science of syllogism! In fact it is *futile*, long, and difficult, and there is *no* science of syllogism!"⁷ Sanchez even argues that syllogism destroys and obscures the sciences:

So what use have all these syllogisms been? Why did Aristotle spend so much effort on teaching them? And why do all his successors still expend their labor on them? When it comes to writing, we do not make any use of syllogisms, nor did Aristotle. No knowledge has ever emerged from them; indeed, they have led many sciences into error and confusion. As for discussions and disputes, we make even less use of syllogisms; we are content with a simple inference from one point to the next. Otherwise, our disputes would never end, but we would have to struggle at every stage to reduce a syllogism to its correct mood and figure, or to convert it, and endless other games of this sort.⁸

Descartes was sympathetic to this sort of criticism; he produced similar arguments in the *Regulae*. There he begins by asserting: "I find of little use those bonds by which the dialecticians seek to rule human reason."⁹ He continues, "as to the other operations of the mind, moreover, which dialectic struggles to direct with the aid of these prior ones, **(p.109)** they are useless here—or rather they may be counted as obstructions, since nothing can be added to the pure light of reason without in some way obscuring it."¹⁰ So he rejects syllogisms as contrary to his ends. According to Descartes,

Dialecticians can find by their art no syllogism that yields a true conclusion unless they first have the material for it, that is, unless they have already learned the truth

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The only positive thing Descartes can say about syllogism or dialectics in the *Regulae* is that there is a distant resemblance between syllogism and his method, which, in the fashion of Ramus and Bacon, is all that he thinks is useful; he asserts: "This is the only respect in which we imitate the dialecticians: just as they, in order to explain the forms of the syllogisms, presuppose that the terms, that is, the matter of the syllogisms are already known, we also require as a prior condition that the question to be solved should be perfectly understood."¹² And he continues by describing what he calls "deduction" as a procedure that finds something unknown from what is already known; he specifies that the procedure can be achieved through a simple comparison of two or more objects with one another by means of a common idea. He insists, however, that "since the forms of the syllogisms are of no help in perceiving the truth of things, it will be of advantage to the reader, if, after he has completely rejected them, he grasps the fact that every cognition whatsoever which is not obtained by a simple and pure intuition of one isolated object, is obtained by the comparison of two or more objects with one another."¹³ So deduction, one of the basic elements of Descartes' method (along with intuition), has little to do with the application of the laws of logic.¹⁴ What Descartes has in mind is the type of inference used in mathematics, when we somehow "perceive" how different propositions relate to each other and how an unknown truth follows from truths already known. Thus Descartes proposes the cultivation of our native powers for discerning truth and falsity (i.e. intuition and deduction) together with his method—ordering, enumeration, etc.¹⁵

(p.110) The *Regulae* was not generally available in the seventeenth century, though some Cartesians had access to various portions of it, as was obvious in the fourth edition of the *Port-Royal Logic* (1674);¹⁶ the work itself was first published in Latin in Descartes' *Opuscula Posthuma* only in 1701.¹⁷ So we should ask: to what extent could Descartes' views on logic be discerned through the treatises published during his lifetime? The answer is that Descartes repeats many of the same negative arguments from the *Regulae* in the *Discourse on Method*, part 2, when he gives what he calls the rules of his method. He also refers to these passages from the *Discourse* in the preface to the French translation of the *Principles*.¹⁸ In the later texts, we find the two traditional negative points about dialectics and syllogism, but the discussion about method is considerably abbreviated and another slightly different positive view seems to emerge as well. Missing in these texts is any overt reference to the supposedly foundational Cartesian view about our native intelligence, intuition, and deduction.

We do encounter the two negative points about logic in the *Discourse*. There is the complaint that syllogisms are useless: "they serve rather to explain to someone else the things one already knows, or even ... to speak without judgment on matters of which one is ignorant, rather than to learn them."¹⁹ There is also the worry that logic in general

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might be harmful: "although it contains, in effect, very true and good precepts, nevertheless there are so many others, mixed up with them, which are either harmful or superfluous, that it is almost as hard to separate the one from the other as to draw a Diana or a Minerva from a block of marble."²⁰ In the *Discourse*, Descartes also compares the possibly harmful or superfluous effects of logic with those of the analysis of the ancients and the algebra of the moderns. He claims that the latter two have defects as well: they both extend to extremely abstract matters which seemingly have no utility; the analysis of the ancients "cannot exercise the understanding without fatiguing the imagination;" and the algebra of the moderns has been made into "a confused and obscure art that bothers the mind, instead of a science that cultivates it."²¹ This is why he sought *another method* "which, having the advantages of these three, would be exempt from their faults,"²² and toward this end, he exhibits his four rules of method: the rules (p.111) of evidence, of the division of difficulties, of the order of inquiry, and of the completeness of enumerations.²³ The rules of method now substitute for what we, readers of the *Regulae*, take to be Descartes' real method, exercising our native intelligence, intuiting and deducing, etc. To make the point clear: intuition and deduction do not occur explicitly in the *Discourse*. The four rules of method stand by themselves without further foundation.

Descartes refers to the *Discourse* in the preface to the French translation of the *Principles* as "a *Discourse on the Method for Conducting One's Reason Well and for Seeking the Truth in the Sciences*, where I summarized the principal rules of logic."²⁴ Thus by 1647, Descartes came to call his four rules of method the principal rules of *logic*. This is to be explained by the passage from the same preface about the tree of philosophy and the order of teaching. According to Descartes, before applying himself to true philosophy a person who has only "common and imperfect knowledge" should study logic, but not the logic of the Schools:

because properly speaking it is only a dialectic that teaches how to make the things we know understood by others, or even to repeat, without forming any judgment on them, many words respecting those we do not know, thus corrupting rather than increasing good sense—but the logic that teaches us how best to direct our reason in order to discover those truths of which we are ignorant. And since this is very dependent on custom, it is good for him to practice the rules for a long time on easy and simple questions such as those of mathematics.²⁵

So again, the logic of the Schools is a "dialectic" that corrupts rather than increases good sense, but this time we also have Descartes' method as another logic recommended as a good practical exercise to improve one's mind. And now the critique of the syllogism is not explicitly mentioned and problems of mathematics are recommended indirectly as things that would exercise the mind.²⁶

(p.112) Before concluding this brief survey of Descartes' views on logic, we should mention one other text that seems a bit different from all the others, though it is not altogether inconsistent with them. The text, a portion of what is often called the *Conversation with Burman*, was not published in the seventeenth century and could have

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hardly affected anyone except Johann Clauberg, who had a role to play in its dissemination. Commenting to (Frans?) Burman on the *Discourse* passage about the harmful role of logic, Descartes allegedly limited the range of these statements to dialectics alone; he said:

This really applies not so much to logic, which provides demonstrative proof on all subjects, but to dialectic, which teaches us how to hold forth on all subjects. In this way, it undermines good sense, rather than building on it. For in diverting our attention and making us digress into the stock arguments and headings, which are irrelevant to the thing under discussion, it diverts us from the actual nature of the thing itself.²⁷

This might have been Descartes' view in 1648, but it would have been an evolution from his more negative assertions about syllogism in the 1620s and 1630s. Logic itself is now rehabilitated; only the rhetorical misuse of logic—"dialectics"²⁸—is considered harmful.

Thus there are at least three Descartes positions to be sketched: (1) the Descartes of the *Regulae*; that is, the real Descartes according to modern interpreters, in which truth is grasped by means of our native intelligence, using intuition and deduction, etc., together with the thought that traditional logic takes us away from the truth; (2) the Descartes of the *Discourse*, in which rules of method are given as another method, instead of traditional logic, which is considered harmful; and (3) the late Descartes, in which the rules of method are given as the principal rules of logic, together with a generally positive view of logic, criticisms of logic being limited to the last portion of it called dialectics.

3.2. Descartes' Metaphysics

The style of Descartes' *Principles*, we should recall, is intended to mimic the style of Scholastic textbooks. Descartes said about the project he was undertaking after he finished the *Meditations* that it would follow the style of the Schools:

I shall use a style more suited to the current practice in the Schools. That is, I shall deal with each topic in turn, in short articles, and shall present the topics in such an order that the proof of what comes later depends solely on what has come earlier, so that everything is connected together in a single structure. In this way I hope I can provide such a clear account of the truth of all the issues normally disputed in philosophy, that anyone who is seeking the truth may be able to find it in my book without any difficulty.²⁹

(**p.113**) The parts of the *Principles* do remind one of the Scholastic order of teaching as well, though, as I have said, with the exception that Descartes' metaphysics (part I of the *Principles*) comes before his Physics (parts II–IV).

Part I, Descartes' metaphysics, is titled Of the Principles of Human Knowledge. It contains a somewhat reordered, abbreviated version of the *Meditations*, for approximately its first forty-six of seventy-six articles. It starts with doubt, proceeds to the *cogito* and the proposition that the mind is better known than the body, and continues

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with proofs for the existence of God—first the a priori proof and then the a posteriori proofs (with a third a posteriori proof not contained in the Meditations). Next are some articles about God's attributes, including the rejection of God as corporeal. Article 24 introduces a new theme, that "the best method of philosophizing" would be to draw an explanation of the things God has created from the knowledge we have of his nature; that is, to go from cause to effect; the French version of the article adds that we would be following this method "if we try to deduce the explanation of the things God has created from the notions that naturally exist in our minds." Following article 24 and a proviso, in article 25, about our needing to believe "all that God has revealed," Descartes discusses the distinction between the infinite and the indefinite. After some articles on error, the criterion of truth,³⁰ and freedom of the will, the *Principles* discusses clear and distinct ideas and pain as clear but not distinct. Articles 47-76 contain mostly new materials: Article 47 introduces another project, subsidiary to article 24, which is to "enumerate all the simple notions that constitute our thoughts, and distinguish whatever is clear in each of them from what is obscure or likely to cause us to err."³¹ The reason for this enumeration also provides a thesis about the cause of error, along the lines broached by Descartes at the end of the Sixth Set of Replies, to which the Principles returns at the end of part I: "in our early years our mind was so immersed in the body that it perceived nothing distinctly ... and formed many judgements then, and contracted numerous prejudices." Articles 48-50 are about the eternal truths and 51-64 concern traditional metaphysical topics: substance (but not being in general)—with the denial of univocal attribution between God and creatures—attributes, modes and accidents; duration and time, number, and universals; and distinctions (real, modal, and of reason). Part I concludes with (p.114) the articles on the causes of error and the prejudices of childhood (arts. 65–74), together with a second, very brief summary of the Meditations, called "the main principles of human knowledge," and a proviso about divine authority (arts. 75-6).

From this brief description of part I of the *Principles*, it should be clear that Descartes' metaphysics does not look very much like any textbook in Scholastic metaphysics. It does not start with the nature, principles, and properties of being, and it does not end with a discussion of God and angels. It does, however, touch upon some of the same topics—predication between God and creatures, distinctions, whether we can form a concept of God, God's attributes, and proofs of God's existence—but not in any order that a Scholastic would expect. Neither does it look like a unified, methodical exposition; it seems more of a hybrid with different purposes targeted in various sets of articles. Its style does seem "suited to the current practice in the Schools," as Descartes says, in that he "treats each question, in short articles," but it is not clear that it follows a geometrical order, in which "the proof of what comes later depends solely on what has come earlier."³²

There is a tradition of saying that the *Principles* is a "synthetic" work.³³ This custom is as old as the *Conversation with Burman*. Burman queried Descartes about the relation between the a posteriori proofs in Meditation III and the a priori one in Meditation V. Burman's Descartes reportedly said:

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By contrast, the other argument in the Fifth Meditation proceeds *a priori* and does not start from some effect. In the *Meditations* that argument comes later than the one here; the fact that it comes later, while the proof in this Meditation comes first, is the result of the order in which the author discovered the two proofs. In the *Principles*, however, he reverses the order; for the method and order of discovery is one thing, and that of exposition is another. In the *Principles* his purpose is exposition and his procedure is synthetic.³⁴

These remarks echo Descartes' discussion of analysis and synthesis in Replies II. Responding to the suggestion that "it would be worthwhile if you set out the entire argument in geometrical fashion (more geometrico), starting from a number of definitions, postulates and axioms,"³⁵ Descartes answers that he did set out the *Meditations* in geometrical manner. He then gives a lengthy discussion of the geometrical manner, distinguishing the order (ordo) and the reason (ratio) of demonstration. He divides the reason of demonstration into two, analysis (or resolution) and synthesis (or composition).³⁶ In some particularly confusing passages, he defines analysis as showing "the true way by means of which the thing in question was discovered methodically, and as it were (tanquam) a priori," and synthesis as using "by contrast a directly opposite way, and as it were (tanguam) a posteriori (though the proof itself is often more a priori than it is in analysis)." (p.115) ³⁷ The French translation by Clerselier, presumably reviewed by Descartes, adds another layer of difficulty by translating *tanguam a priori* by "the effects depend on the causes," and tanquam a posteriori by "the causes by their effects."³⁸ Descartes does say that synthesis "uses a long series of definitions, postulates, axioms, theorems and problems," and "wrests from the reader his assent, however hostile and obstinate he may be." But "it does not satisfy the minds of those who desire to learn, since it does not teach the way in which the thing was discovered."³⁹ At least Descartes also gave an example of what he meant by synthesis, namely the Appendix to Replies II, "Arranged in Geometric Fashion," with definitions, postulates, axioms, and theorems.

Modern commentators have made much of Descartes' discussion of analysis and synthesis. Some have linked it to Descartes' previous statements about an order of knowledge and an order of being.⁴⁰ Others have linked it to Descartes' previous views about method, or resolution and composition.⁴¹ And others have decided that Descartes' corpus contains different senses of analysis and synthesis.⁴² At least one essay concludes that the terms "analytic" and "synthetic" taken in the sense Descartes gives them in a mathematical context seem particularly inappropriate as a way of construing what Descartes is doing in the *Meditations*.⁴³ It is worth pointing out that Descartes does not mention analysis and synthesis in a non-mathematical context in any printed source before his discussion in Replies II.⁴⁴ Descartes did discuss resolution and composition (the Latinate version of the distinction) as an aspect of his method of investigation in the *Rules*, but that does seem to be a different distinction from analysis and synthesis as a "reason" of demonstration or exposition. The basic point is that resolution and composition in the *Rules* are two aspects of the same method, whereas analysis and **(p.116)** synthesis in Replies II are two "reasons" of demonstration or two manners of

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writing. Similarly, Descartes did distinguish between individual things "in relation to the order they have with respect to our knowledge" and "as they really exist,"⁴⁵ but again, there is no real reason to connect this distinction from the *Rules* with analysis and synthesis.

What is clear is that, unlike the Geometrical Appendix, that model of synthetic exposition, Principles part I does not start with a long series of definitions, postulates, and axioms, and does not consist of theorems but of short articles. And although the beginning of *Principles* part I starts with doubt and the *cogito* and the proposition that the mind is better known than the body, just like the *Meditations*, the proofs for God's existence in it are indeed reversed, as they are in the Geometrical Appendix. The a priori proof comes before the a posteriori proofs there, unlike what happens in the *Meditations*, where the a posteriori proofs are located in Meditation III and the a priori proof in Meditation V. Since the Meditations, the Geometrical Appendix, and Principles part I are all said to follow a geometrical order such that the proof of what comes later depends solely on what has come earlier, one can ask how it is possible that the proofs are reversed. The answer for the reversal between the order of the proofs in the Meditations and in the Geometrical Appendix is generally clear. The Meditations is an analytic exposition in more geometrico, whereas the Geometrical Appendix is a synthetic exposition in more geometrico. The order of proofs following the analytic path of discovery requires the a posteriori proofs to precede the a priori proof, given that the a priori proof requires, for example, the criterion of truth-that all that I clearly and distinctly perceive to belong to that thing really does belong to it-which is not established until Meditation IV; that is, after the a posteriori proofs in Meditation III.⁴⁶ In the Geometrical Appendix, the a priori proof could come first, since the criterion of truth (or something resembling it) is given in its Postulates, referred to in the proof of Proposition I.⁴⁷ The question remaining is how the proofs could be reversed in Principles part I when the criterion of truth is affirmed in article 30, after the a priori proof in article 14 and the a posteriori proofs in articles 17– 21. This looks like a violation of geometrical order, whether analytic or synthetic, unless, of course, the postulates of the Geometrical Appendix are assumed in the Principles (or the proof and procedure in *Principles* part I are radically different than the ones in the *Meditations* and Geometric Appendix). (p.117) 48 The seeming violation reinforces the suspicion that the Principles is neither analytic nor synthetic, but a hybrid project constructed with different objectives in mind.⁴⁹

Some of Descartes' Simple Notions

To keep the analysis between Descartes' and the Scholastics' discussions of metaphysics somewhat parallel, I examine some of Descartes' views about the "simple notions that constitute our thought," such as (1) his claims about substance and (2) his theory of distinctions. I also look briefly at (3) Descartes' principles of individuation (even though they are not discussed in *Principles* part I), and finish with (4) the issue of whether we can form a proper concept of God.

(1) *Principles* part I article 51 is about substance. The title of the article asserts that "it is a name we cannot attribute in the same sense to God and his creatures." The text adds

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PRINTED FROM OXFORD SCHOLARSHIP ONLINE (www.oxfordscholarship.com). (c) Copyright Oxford University Press, 2015. All Rights Reserved. Under the terms of the licence agreement, an individual user may print out a PDF of a single chapter of a monograph in OSO for personal use (for details see <u>http://www.oxfordscholarship.com/page/privacy-policy</u>). Subscriber: University of Arizona Library; date: 12 September 2015 that "the name substance does not pertain *univocally* to God and to other things, as they say in the Schools, that is, there is no meaning that can be distinctly understood as common to God and to his creatures." We first note that the Scholastic question of the univocity of being is transformed into a question about the univocity of substance, Descartes' preferred term. The issue is basically a new one for Descartes.⁵⁰ The question of univocal predication was formally raised only in the Second and Sixth Replies (which are co-temporal with part I of the *Principles*), and then again, later, in a 1649 letter to Henry More. In the Second Replies, Descartes asserts: "we recognize that none of the properties which, on account of the imperfection of our understanding, we ascribe piecemeal to God just as we perceive them in ourselves, belong univocally to God and to us";⁵¹ in **(p.118)** the Sixth Replies, that "no essence can pertain univocally to God and to a creature";⁵² and in the *Letter to More*, that he "does not think that any mode of action belongs univocally to both God and creatures."⁵³ All of these statements elaborate somewhat on the point in Principles, I, article 51, but none of them tell us whether substance, properties, essences, or modes of action belong analogically or equivocally between God and creatures.

Perhaps we can make some sense of Descartes' view by appealing to the Scholastic background it supposedly refers to—Descartes did say "the name substance does not pertain univocally to God and to other creatures, as they say in the Schools." Initially, non-univocity entailed equivocity. For example, Boethius considered non-univocal terms to be equivocal but divided the latter into chance and deliberate equivocals. He cites, as an example of a chance or pure equivocation, a barking or four-footed animal, a marine animal, and a constellation all being called "dog (canis)." A subdivision of Boethius' second type of equivocal terms included some terms called "analogical." A three-fold division later arose, with analogical terms no longer being considered a species of equivocity but as intermediaries between equivocal and univocal terms. Such was the case with Aguinas.⁵⁴ The issue was further complicated by the influence of Scotus, who argued that without a unified conception of being, theology as a science would be impossible, as we would have no natural knowledge of God.⁵⁵ By the seventeenth century, the discussion basically consisted of a dispute between the Thomists and the Scotists, with the Thomists looking as if they had the upper hand: analogical predication is championed, but within a context in which one affirms that being is "common" between God and creatures.

This does not resolve the problem of what the denial of univocity might amount to for Descartes. Although seventeenth-century Scholastics seem to have fashioned a compromise that called for analogical predication, as long as we are dealing with a three-fold distinction, the denial of one of the options does not tell us which of the other two holds: if, for Descartes, substance, properties, essences, or modes of action do not belong univocally to God and creatures, do they belong analogically or equivocally? We have a case where there are three choices, Descartes denying one of the three, but not telling us which of the other two he holds. Perhaps he takes it as obvious that the predication is analogical (as we have shown de Ceriziers doing in Chapter 2).⁵⁶ That may be true in this context, but, as we shall see, equivocal predication is, in fact, a live option for the Cartesians, as it was for Spinoza. Spinoza argued against an anthropocentric

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conception of God in terms of human mental faculties by claiming that even if God had intellect and will, they would not agree with our intellect and will: "They could be no more alike than the celestial constellation of the Dog and the dog that **(p.119)** barks."⁵⁷ This is almost a repetition of what Spinoza said in the *Metaphysical Thoughts* (presumably on behalf of Descartes): "For God's knowledge is no more like human knowledge than the Dog, the constellation in the sky, is like the dog, the barking animal, and perhaps even less so."⁵⁸ Thus, we should delve a bit more into Descartes' intentions: does non-univocity entail analogicity or equivocity for Descartes?

Contemporary commentators normally take Descartes' denial of univocity to entail that he holds for some account of analogy between God and creatures.⁵⁹ Their evidence for this is three-fold. In the discussion of God as *causa sui*, in Replies IV, Descartes talks about "using the analogy of an efficient cause in order to explain those things that pertain to a formal cause, that is, to the very essence of God."⁶⁰ And in the *Meditations*, he refers to being made in God's image and likeness: "To be sure, it is not astonishing that in creating me, God should have endowed me with this idea, so that it would be like the mark of the craftsman impressed upon his work, although this mark need not be something distinct from the work itself. But the mere fact that God created me makes it highly plausible that I have somehow been made in his image and likeness."⁶¹ Descartes also says that the resemblance between himself and God is even greater in the case of the will: "the will is the chief basis for my understanding that I bear a certain image and likeness of God."⁶² The proposition that God has created in his image and likeness was contested in the *Conversation with Burman*; this discussion adds another reason for analogical predication, namely that the effect resembles the cause:

[O] But why do you say that? Surely God could have created you without creating you in his image?

R. No. It is a common axiom and a true one that the effect is like the cause. Now God is the cause of me, and I am the effect of him, so it follows that I am like him

[O] But in that case even stones and suchlike are going to be in God's image.

R. Even those things do have the image and likeness of God, but it is very remote, minute, and indistinct. 63

This evidence of an analogy between God and creatures in Descartes is not particularly compelling. Using efficient causation analogically for formal causation in God does not say very much about an analogy holding between God and creatures; the analogy **(p.120)** between efficient causation and formal causation does not tell us that formal causation is itself appropriate, whether univocally, equivocally, or analogically for God's activity. Moreover, the invocation of "the effect resembles the cause" is problematic, in part because of the unreliability of the *Conversation with Burman*. But, even so, one does not have to think that the mark of the craftsman on his work has to result in a real resemblance between the two. In fact, Descartes is particularly guarded in Meditation III: "the mere fact that God created me makes it *highly plausible (valde credibile est/il*

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est fort croyable) that I have *somehow* (*quodammodo/en quelque façon*) been made in his image and likeness." So the talk of our being made in the likeness and image of God does not need to entail an analogy between God and creatures.

"Likeness and image" becomes very attenuated when even stones are said to be made in that likeness and image; and the comparison between my will and that of God, "the chief basis for my understanding that I bear a certain image and likeness of God," produces a radical difference, more a difference of kind than a difference of degree (or an analogy). As Descartes asserts in *Principles*, I, article 23, stressing the dis-analogy between our will and God's will: "God understands and wills—not indeed as we do, by operations which are in some way distinct one from another, but by a single identical and very simple action by which he understands and wills and effects everything." This is an affirmation of the unity of the divine will and intellect. For Descartes there is in God neither knowing without willing nor willing without knowing. If Descartes' views on God's creation of the eternal truths lead to the "disappearance of analogy" between God's will and ours, they also do the same for God's mind and ours, because of the unity of the divine will and understanding. In the end, one can focus on something else Descartes says in Replies II: "I can imagine a greater analogy or parity between colors and sounds than between corporeal things and God."⁶⁴ Perhaps this is an expression of analogy, but it looks more like an expression of equivocation; that is, more like the constellation Dog and the barking dog.

(2) Descartes' theory of distinction, like his theory of substance, is new, or at least it dates from the same time as the *Objections and Replies*; that is, after the text of the *Meditations* was circulated. Now, numerous scholars have pointed out the similarities between Descartes' theory of distinctions, Principles, I, articles 60-2, and that of Suárez, *Metaphysical Disputations*, disp. 7.⁶⁵ In the *Principles*, Descartes defines three kinds of distinctions: real, modal, and of reason. For Descartes a real distinction is one that holds between two substances: "we can conclude that two substances are really (p.121) distinct one from the other from the sole fact that we can conceive the one clearly and distinctly without the other."⁶⁶ A modal distinction holds between the mode and the substance of which it is the mode. The two things modally distinct are not really distinct since we can clearly conceive a substance without the mode that differs from it, but, reciprocally, we cannot have a perception of the mode without perceiving the substance. Finally, a distinction of reason holds between a substance and one of its attributes or between two such attributes of the same substance; the two things distinguished by reason are neither really nor modally distinct. Suárez likewise argues for a third distinction between the real and that of reason, that is to say a modal distinction, which is not the Scotist formal distinction. And for Suárez, like Descartes, two-way separability is a sign of a real distinction of one thing from another, one-way separability a sign of a modal distinction of a thing from its mode, and mutual inseparability a sign of a distinction of reason between a thing conceived in one way and the same thing conceived in a different wav.⁶⁷

Descartes' theory of distinction certainly seems important to his philosophy. One can point

to the fact that the subtitle of the *Meditations* and the title of Meditation VI in particular indicate that the aim of that work, like that of at least some of *Principles* part I, is the demonstration of the real distinction between mind and body; that is, of a real distinction and not that of a modal distinction or distinction of reason. The thesis that the mind is a mode of the body is certainly not Descartes', though it was that of his erstwhile disciple Regius.⁶⁸ It is one that Descartes explicitly rejected.⁶⁹ There are two further occasions in the first edition of the *Meditations* (1641) in which Descartes speaks about the real distinction between mind and body. There is also an occasion in which he refers to a distinction of reason, although that instance, in Meditation III, in which he discusses the difference between God's conservation and God's creation of the world, is perhaps not phrased in any technical language.⁷⁰ Thus, there are four instances in the pre-1640 work of Descartes (that is, in and before the *Meditations* and its preliminary essays, but not in the *Objections* and *Replies*) referring to the real distinction between mind and body to consider: (i) in the subtitle of the work; (ii) in the title to Meditation VI; (iii) in the Letter of Dedication to the Sorbonne; and (iv) in the Synopsis of the *Meditations*.

Descartes revised the subtitle of his work between its Latin editions. Originally subtitled "in which the existence of God and the immortality of the soul are demonstrated," it was changed in the second edition (1642) to "in which the existence of God and the distinction between the human soul and body are demonstrated." Moreover, the 1647 **(p.122)** French edition title is similar to that of the 1642 Latin edition, although not without some variations. In the French edition both title and the subtitle contain an extra significant adjective not found in the Latin versions: "*Les Meditations Metaphysiques de René Descartes touchant la premiere philosophie*, dans lesquelles l'existence de Dieu, et la distinction réelle entre l'âme et le corps de l'homme, sont demonstrées." Thus the term "real" in the subtitle of the *Meditations* was introduced in 1647. The term "real" in the title to Meditation VI was requested by Descartes but not until 28 January 1641. In that letter to Mersenne, Descartes writes:

I see that people take more account of the titles that are in books than of all the rest. This makes me think that to the title of the Second Meditation, *Of the Human Mind*, one can add, *that it is better known than the body*, so that it will not be thought that I wanted to prove its immortality there. And afterward, in the ... sixth, one can add, *Of the existence of material things—and of the real distinction of mind from body*. For these are the things to which I want people to pay most attention.⁷¹

The two other cases of "real" distinction (the Letter of Dedication to the Sorbonne and the Synopsis) can also be dispensed with. Neither is integral to the text and argument of the *Meditations* and both were written after the manuscript of the *Meditations* was circulated for *Objections*. We can know this even though we do not have the original manuscript of either document and cannot tell exactly when Descartes inserted the term real.⁷²

A change in Descartes' views concerning distinctions subtly emerges through the *Meditations*, the *Objections*, and the *Replies*. In the *Principles*, however, Descartes

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ultimately acknowledges it to be a genuine change. In the *First Set of Objections* Caterus queries Descartes about his proof of a real distinction and Descartes responds in a rather muddled fashion. Caterus states: "He [Descartes] seems to prove the distinction (if that is what it is) between the soul and the body by the fact that they can be conceived distinctly and separately. Here I leave the very learned gentleman with Duns Scotus, who declares that, for one thing to be conceived distinctly and separately from one another, it suffices that there be a distinction which he calls 'formal and objective,' which he claims to be midway between a real distinction and a distinction of reason."⁷³

Descartes answers:

As far as the formal distinction is concerned, which the very learned theologian draws from Duns Scotus, I declare briefly that a formal distinction does not differ from a modal distinction, and that it applies only to incomplete beings, which I have carefully distinguished from complete beings. Moreover, it surely suffices for a formal distinction that one thing be conceived distinctly and separately from another by an act of abstraction on the part of the intellect inadequately conceiving the **(p.123)** thing, yet not so distinctly and separately that we understand each one as something existing in its own right and different from every other thing.⁷⁴

Descartes proceeds to illustrate his thought with the distinction between the motion and the shape of the same body, ultimately dealing with the distinction between justice and mercy, which Caterus brings up as an example. Sometime later, prodded by the use Arnauld made of his distinctions while referring to Descartes' answer to Caterus,⁷⁵ it must have dawned on Descartes that he was confusing formal, modal, and distinctions of reason. When he finally officially sets out his theory of distinctions in the *Principles*, Descartes states in the article on distinction of reason: "I recollect having elsewhere conflated this sort of distinction with modal distinction (near the end of the *Reply to the First Set of Objections* to the *Meditations on First Philosophy*), but then it was not necessary to treat accurately of these distinctions, and it was sufficient for my purpose at the time simply to distinguish them both from the real."⁷⁶ That may be right, but still this episode imparts the distinct impression that the Cartesian doctrine was in the process of formation.⁷⁷

(3) Descartes does not formally discuss individuation in *Principles* part I. He does tackle the related problem of universals "as they are called in the Schools," but only says that they are simply modes of thought.⁷⁸ He tackles individuation in the context of physics; he gives a criterion of individuation for extended things in *Principles* part II, "all the variety in matter, or all the diversity of its forms, depends on motion."⁷⁹ And, however he meant it, others, such as Spinoza, officially followed this view as well: "Bodies are distinguished from one another in respect of motion-and-rest, quickness and **(p.124)** slowness, and not in respect of substance," repeating "Bodies are individual things which are distinguished from one another in respect of motion-and-rest."⁸⁰

But in a letter to the Jesuit Mesland, Descartes sketched a different account of individuation for bodies and for the human body:

the surface does not receive its numerical identity from the numerical identity of the bodies in which it exists, but only from the identity or similarity of the dimensions. In the same way we can say that the Loire is the same river as it was ten years ago, even though it is no longer the same water, and perhaps there is no longer any part of the same earth that surrounded that water.⁸¹

In the case of a human body, it remains the same through changes of matter, on account of its union with a soul: "they are numerically the same (*eadem numero*), only because they are informed by the same soul."⁸² Thus, humans naturally transubstantiate other matter by incorporating it and making it part of their bodies, bodies that are informed by a soul.⁸³ In a similar fashion, Descartes accounts for the miracle of transubstantiation by the soul of Christ supernaturally informing the matter of the host upon consecration.⁸⁴

Thus, when he needed to, Descartes could come up with a principle of individuation for human bodies, one similar to the Scotist principles discussed previously. Still, this principle of individuation was not readily available to the Cartesians. Although Clerselier published Descartes' correspondence in three volumes from 1657 to 1667, he did not include Descartes' letter to Mesland of 9 February 1645, concerning the Eucharist, in any of the volumes. Clerselier circulated the letter in private, but did not publish it because he thought it too politically sensitive.⁸⁵ Even Descartes recognized that he was dealing with delicate matters. When writing to Mesland, he expressed the fear that, since he was not a theologian by profession, things he might write could be less well taken from him than from another. Thus, he wrote about the Eucharist to Mesland "under the condition that, if you communicated it to others, it would be without attributing its invention to me, and even that you would communicate it to no one, if you judged that it is not entirely in conformity with what has been determined by the Church."⁸⁶ Similarly. when Arnauld later asked Descartes for further explanations, Descartes answered that he would fear an accusation of rashness if he dared to come to any specific conclusion on the guestion, and that he would prefer to communicate such conjectures by word of mouth, rather than in writing.⁸⁷ Such circumspection might have (p.125) been needed; the sacrament of the Eucharist was a point of division between Catholics and Protestants at a time when religious wars had been waged throughout much of Europe. Thus Descartes did not publish his principle of individuation for informed bodies and his views on the matter were not disseminated widely during the seventeenth century.

(4) Descartes is a proponent of the ontological (or a priori) argument, unlike most seventeenth-century Scholastic textbook authors, but oddly, he agrees with them about whether we can form a proper concept of God. His views are developed in *Principles* part I, but also all over his corpus, and especially in his correspondence. For Descartes, God is the only being in whose perfections we notice no limits; he is the only being we positively "intellect" as infinite;⁸⁸ and we can see that he is greater than the world,⁸⁹ so that the world cannot be called infinite.⁹⁰ But it conflicts with our conception, or it involves a contradiction, that the world should be finite or bounded.⁹¹ Hence we call it indefinite; we can say that a thing is indefinitely large, provided we have no arguments to prove that it has bounds.⁹² Descartes refers to the infinite as "incomprehensible."⁹³ Since God is

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infinite, God is also incomprehensible: "when God or infinity is in question, we must consider not what we can comprehend—we know that they are beyond comprehension."⁹⁴ But we must be able to receive the idea of God in some way, so that we must stand in some intellectual relation to God; although we cannot comprehend God's infinity (embrace him with our thought), we can know and perceive that God is infinite (touch him with our thought)⁹⁵ and we can have an idea of him.⁹⁶ However, he is properly inconceivable.⁹⁷ Descartes classifies conceiving and comprehending in the same category in a letter to Mersenne: "I know that God is the author of everything. ... I say I know this, not that I can conceive or comprehend it";⁹⁸ but he states in another letter that "if God is not conceived by the imagination, then either one conceives nothing when one speaks of God (which would indicate a frightening sign of blindness) or one conceives him in another manner; but in whatever way we conceive him, we have an idea of him."⁹⁹ However, in Replies II Descartes seems to (p.126) use "conceiving" as a general mental operation encompassing both "intellecting" and comprehending; he distinguishes between two kinds of conception, a "full and complete conception" of God-which we do not have—and "a mediocre and imperfect" conception of God—which we do have.¹⁰⁰

In *Principles* part I, Descartes seems to take conventional seventeenth-century Scholastic views on metaphysical questions about such topics as the non-univocity of substance, the theory of distinctions, and whether we can form a proper concept of God. He does not discuss the principle of individuation, but if he had, we would have seen another ground of convergence between him and seventeenth-century Scholastics.

3.3. Some Elements of Descartes' Physics

The Scholastic exposition of physics, as I said, using Eustachius a Sancto Paulo's *Summa* as a model, moves from "natural body in general," from principles of natural things, to their causes, to common properties; that is, matter, form, causes, place, infinity, void, time, and motion; then to "inanimate natural body," from the world and heavens, to elements, and mixed bodies; and finally to "animate natural bodies," from the soul in general, to vegetative, sensitive, and rational souls.¹⁰¹ Similarly, Descartes' *Principles* moves from Descartes' metaphysical doctrines to the principles of Cartesian physics, then to the nature of the universe and to the origins of the earth and terrestrial phenomena (from Part (I) The Principles of Human Knowledge to (II) Principles of Material Things, (III) The Visible World, and (IV) The Earth). As we have also said in the Introduction, Descartes had proposed for himself two further parts: "a fifth part on living things, i.e. animals and plants, and a sixth part on man," which he was not able to write.¹⁰²

Descartes begins his discussion of substance, infinity, and time in part I of the *Principles*. He continues at the beginning of part II with body as extension, place or space, and void. Most of part II, however, consists of his treatment of motion. Part II ends with the proposition that the only principles Descartes accepts in physics "are those of geometry or abstract mathematics." Parts III and IV, about celestial and terrestrial phenomena, also elaborate a theory about hypotheses, beginning with their use in astronomy at the beginning of part III and ending with a general view of them at the end of part IV. My discussion of Descartes' physics and the parallel discussion of Cartesian physics in

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Chapter 4 will be limited to these topics: the common properties of natural things; the relation (or subalternation holding) between mathematics and physics; and the status of hypotheses (involving the notion of moral certainty).

(p.127) Common Properties of Natural Things

Traditional accounts of the seventeenth century treat the systematic philosophy of Descartes as a comprehensive rejection of Scholasticism. Given the heterogeneous state of philosophical affairs in the early part of the century, Descartes' break from the doctrines of the Schools cannot be as comprehensive as claimed. Nevertheless, his contributions to the concepts of matter and space, his apparent rejection of substantial forms, real qualities, and final causes should not be considered any less significant philosophical accomplishments. Although he wished to capitalize on an increasing awareness that philosophy was in a state of disrepair—an old building that needed to be torn down, instead of being repaired—and to posit another system for its replacement, his methods (at least rhetorically) reflected a more cautious approach. As I have said, Descartes frequently denied the novelty of his philosophical principles. Moreover, he seems not to have believed that he would be seen as mounting a direct frontal assault on the old philosophy. He revealed in a letter to Mersenne: "I hope that those who read my *Meditations* will accustom themselves insensibly to my principles, and will recognize their truth before noticing that they destroy those of Aristotle."¹⁰³

Still, in the same fashion as contemporary critics of Aristotle, Descartes dismissed matterform talk as unnecessary, though like them he made an exception for humans, who are endowed with a rational soul. If, on various fronts, the way had been prepared for his new program, that is not to deny that Descartes himself made, and encouraged in others, a radical break with the hylomorphic tradition. In his mature work, he unequivocally elevated matter to the rank of substance and emphatically eliminated the various kinds of soul that used to mediate between mere matter and separable mind. There is finite extended substance (which can stretch indefinitely, but is not infinite) and finite thinking substance and God, or infinite spiritual substance, and that is all. Scholastic form-matter thinking seems to have faded from view. There was, of course, the one case of our minds informing our bodies; this was even a *substantial* form. For Descartes it was the only substance that does, in our case, function as the form of another substance, the human body, or as the substance informing another substance to constitute a complex substance.¹⁰⁴ Over against his insistence on this one, exceptional substantial form, Descartes did indeed attack the notion of substantial form directly on a number of occasions, while in the Meteors he remarked that, although he had nothing against the concept, he just did not need it.¹⁰⁵ In an admonitory letter to Regius, whose statement that man was a being "per accidens" was instrumental in fueling the notorious guarrel between Descartes and the Utrecht theologians, Descartes called Regius' attention to that remark in the *Meteors*. Adjuring him not to use harsh words, he continued:

Above all, I would like it if you never proposed any new opinions, but always retained the old ones in name, and contented yourself in bringing forward new reasons ... For example, what **(p.128)** need did you have to reject openly

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substantial forms and real qualities? Do you not remember that in *Meteors*, p. 164, I said quite expressly that I did not reject or deny them in any way, but simply that I did not need them to explain my reasons? If you had followed this course, there would not have been anyone in your audience who would not have rejected them, seeing that they were useless, and in the mean time you would not have have aroused so much anger in your colleagues.¹⁰⁶

This piece of advice was revealing for Descartes' own use of traditional concepts, and here, of "form" in particular. Matter, of course, had been officially liberated (except in our case) from its hylomorphic captivity, and reigned as *res extensa* throughout the natural world. Form, on the other hand, seemed at first sight to have slipped quietly away.

As early as the unpublished *Le Monde*, Descartes prepared the reader for his own definition of form. He said, "others may, if they wish, imagine in this wood the form of fire, the quality of heat, and the action that burn as completely different things.... I am satisfied in conceiving of the motion of its parts."¹⁰⁷ This was at best a subtle rejection of an essential component of Peripatetic philosophy and an introduction to his own more rarified ontology. He went on not so much to banish the word "form," but to use it in his own novel way. "The forms of all inanimate bodies can be explained without needing to assume anything in their matter other than the motion, size, shape, and arrangement of its parts."¹⁰⁸ Descartes defined matter as extension, "the property of occupying space," all of it explicable in geometrical terms. Particular ways of being extended he called the "forms" or modes of matter. In the Principles Descartes called extension the "principal attribute" of matter and explicitly replaced forms, including substantial forms, by dispositions in the size, shape, and motion of the parts of bodies. Hence "form" lost its standard ontological reference as something above and beyond matter, and instead refered to body in terms of its particular modes of extension. Descartes' view can thus be understood as the end of the thread of thought that subordinated the traditional notion of form to that of matter.

A positive use of "form" occurs in the *Principles*. It is by no means a central concept, but it occurs in two passages, in both of which it has the meaning of figure or size that it had already acquired, to a large extent at least, in *Le Monde*. *Principles*, II, article 23 tells us: *"All the variety in matter, or all the diversity of its forms, depends on motion."* And the explanatory paragraph shows us in a nutshell how satisfactorily Descartes has come to terms with Scholastic form-matter talk:

There is therefore but one matter in the whole universe, and we know this by the simple fact of its being extended. All the properties which we clearly perceive in it may be reduced to the one, namely, that it can be divided, or moved according to its parts, and consequently is capable of all these affections which we perceive can arise from the motion of its parts. For its partition by thought alone makes no difference to it; but all the variation in matter, or diversity in its forms, **(p.129)** depends on motion. This the philosophers have doubtless observed, inasmuch as they have said that nature was the principle of motion and rest, and by nature they

understood that by which all corporeal things become such as they are experienced to be. $^{109}\,$

A brief reference to "forms" in the text of *Principles*, II, article 47, though incidental to Descartes' argument there, is perhaps equally revealing. "By the operation of [the laws of nature," Descartes told us, "matter must successively assume all the forms of which it is capable."¹¹⁰ As Vincent Carraud has pointed out, Descartes is here echoing a statement by Thomas Aquinas, but with a very different intent, since here, again, "form" is simply shape and size, and it is through Descartes' (divinely decreed) laws of (purely local) motion that the "successive assumption" of all forms possible for it will occur.¹¹¹ The same words, with a wholly different intent.

In The Rules, Descartes' indictment of the Scholastic use of "place" was somewhat tempered: "When the learned call place the surface of the surrounding body, they are not really representing anything false, but are merely misusing the term place."¹¹² He did deny the Scholastics' concept of internal place and poked fun at their concept of imaginary place. But in the *Principles*, he developed a doctrine of internal and external place clearly indebted to those he had previously rejected. In *Principles*, II, articles 10–12, he asserted that space, or internal place, does not differ from the corporeal substance contained in it, except in the way that we conceive of it; the same extension that constitutes the nature of body also constitutes the nature of space. In articles 13-15, he distinguished between two types of place, developing a notion of external place and discussing its relation to space or internal place. For Descartes, the particular motion of their matter differentiates objects. All matter is essentially the same extended stuff. Therefore Descartes must appeal to a comparison between the relative motion of an object's parts and the motion of the surrounding body or space. In other words, to determine an object's situation among other bodies (in space), we must take into account other bodies we consider motionless. For this end, we may define external place, namely the surface of the neighboring body and ultimately some supposed fixed referent. The body then can be said to change its external place (situation) and not change its internal place (extension or shape). However, for Descartes, this is a conceptual distinction, since he also believed it is impossible ultimately to discover any truly motionless points in the universe. Descartes asserted that "there is nothing that has a permanent place except insofar as it is fixed by our thought."¹¹³ Of course this distinction had the added advantage of allowing him to claim that the earth can be conceived as a fixed locus around which the surrounding world moves. Descartes (p.130) must have hoped it would allow him to escape affirming the condemned proposition that the earth moves, thereby sidestepping Galileo's difficulty that had apparently prevented him from publishing Le Monde in the first place. In the end Descartes' theory of space was a relatively conservative, Aristotelian-inspired theory. This must have been a conscious decision for him. He could have chosen from several competing concepts of space, developed by new Platonists such as Giordano Bruno, Bernardino Telesio, and Tommaso Campanella. All three conceived of space as a container, independent of bodies, but always occupied by them.

Descartes remained close to some Peripatetics with respect to his concept of space and

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distanced himself from atomism by rejecting the void. Unlike his consistent dismissal of substantial forms, however, he initially remained ambiguous about the possibility of the void. In Le Monde he poked fun at those who argued against the existence of a void or vacuum by appealing to a final cause. He stated that it is, for instance, improper to attribute to "fear of a vacuum" the failure of wine to drain from a hole in the bottom of an otherwise unpunctured cask. "We know well that the wine does not have a mind to fear anything; and even if it did, I do not know for what reason it could have to be apprehensive of this void, which is in fact nothing but a chimera."¹¹⁴ Descartes nevertheless developed a plenist explanation of why an added hole in the top of the cask would result in the evacuation of the wine. "We must say that the wine cannot leave the cask because outside everything is as full as it can be, and the part of the air whose place it would occupy, if it were to flow out, cannot find another place to occupy in all the rest of the universe, unless an opening were made at the top of the cask, through which this air can rise by a circular path into its place."¹¹⁵ He conceded, however, that he did not thus prove the impossibility of a vacuum, preferring instead to remain ambiguous: "I do not wish to say for certain that there is no void at all in nature. I fear my treatise would become too long if I undertook to explain the matter at length."¹¹⁶ Descartes' reasons for penetrating no further in the early work are opaque; the natural existence of void and God's absolute power to create one were topics with a heritage that included Church condemnations and well-known controversy among his contemporaries. Yet by the time Descartes began work on the Principles several years later, he believed he had "demonstrated the impossibility of a vacuum,"¹¹⁷ a result that strictly followed from his definition of matter:

As regards a vacuum in the philosophic sense of the word, ... it is evident that such cannot exist, because the extension of space or internal place, is not different from that of body. For, from the mere fact that a body is extended in length, breadth, or depth, we have reason to conclude that it is a substance, because it is absolutely inconceivable that nothing should possess extension, we ought to conclude also that the same is true of the space which is supposed to be void, i.e. that since there is in it extension, there is necessarily also substance.¹¹⁸

(p.131) Descartes punctuated his account with an allusion to the Scholastics' argument that God could annihilate a body, leaving its container void. His answer was that if God were to do this, the sides of the container would come into immediate contact with each other. The differences in Descartes' early and later positions against the void remain difficult to explain on philosophical grounds alone. It would seem that his identification of matter with extension should have precluded any possibility of a void in his *Le Monde* as well.

The Relation between Mathematics and Physics

Descartes issued a number of pronouncements about what he considered the relations among physics, metaphysics, and mathematics in his published writings and correspondence. Some of these were surely the reason why the Jesuits asserted that "the Cartesian hypothesis must be distasteful to mathematics ... because it is applied to

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the explanation of natural things, which are of another kind" (see Chapter 1). These pronouncements of Descartes cause him to be numbered as one of the principal actors of the Scientific Revolution, as a proponent of the mathematization of nature, along with the likes of Galileo and Newton. There is a century-old narrative to that effect, still generally held these days. Advocates of the thesis included the historians of philosophy and science Edwin Arthur Burtt, Eduard Jan Dijksterhuis, and Alexandre Koyré: Burtt published the first edition of his *Metaphysical Foundations of Modern Science* in 1924;¹¹⁹ Dijksterhuis reiterated in large part the historical-philosophical accounts implicit in Burtt's work in 1950;¹²⁰ and the views of Burtt and Dijksterhuis found their historiographical champion in Koyré's Husserlian- and Bachelardian-inspired position.¹²¹ In 1950 Dijksterhuis already knew and cited a number of Koyré's theses from his publications available in the 1940s, such as Koyré's thesis on the mathematization of physical space. As Dijksterhuis states,

The substitution of the world-picture of classical physics for that of Aristotle involved a radical change in the conception of space in which the phenomena of nature occur. Without explicitly saying so, scientists had always thought of the latter as physical space to distinguish it from the geometrical space to which the reasonings of mathematics related. ... In the sixteenth and **(p.132)** seventeenth centuries, however, this distinction was becoming blurred. ... Koyré characterized this by the term "mathematization of physical space."¹²²

The reference Dijksterhuis gives is to Koyré's 1939 *Études galiléennes*. There Koyré does state that one of the major changes between classical and modern science is "the geometrisation of space," that is to say, "the substitution for the concrete space of pre-Galileo physics of the abstract space of Euclidean geometry. It was this substitution that made the invention of the law of inertia possible."¹²³

This grand narrative of the mathematization of nature misinterprets Descartes' position about the relation between physics and mathematics and (as I will show) makes little sense of the Cartesians on this issue. Basically, there is no one thing that can be called the mathematization of nature in Descartes. To establish this, I will first discuss the views of Burtt and Dijksterhuis on Descartes and the mathematization of nature and try to show in what ways Descartes' position differs from their interpretations. In the next chapter on Cartesian physics, I will show that various Cartesians in the seventeenth century understood Descartes differently than Burtt and Dijksterhuis did. The Cartesians had little to say about the mathematization of nature when viewed as a grand narrative for the scientific revolution, though their remarks on the relations between mathematics and physics advanced various aspects of Descartes' understanding about those relations and contrasted with the way we conceive of them as part of that grand narrative.

Burtt's chapter on Descartes proceeds chronologically, Burtt referring to Descartes' early interest in mathematics, including the "remarkable experience" of 10 November 1619, which confirmed for Descartes the "trend of his previous thinking and gave the inspiration and the guiding principle for his whole life-work," namely, according to Burtt, the conviction "that mathematics was the sole key needed to unlock the secrets of

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nature."¹²⁴ Burtt follows this introduction with a section called "Mathematics as the Key to Knowledge." There, Burtt details Descartes' Rules, which he calls "a series of specific rules for the application of his all-consuming idea," starting with Rule 1 "that all the sciences form an organic unity," and interpolating something from the Search for Truth that "all the sciences must be studied together and by a method that applies to all."¹²⁵ He asserts that "the method must be that of mathematics, for all that we know in a science is the order and measurement revealed in its phenomenon" and, citing Rule 4, that "mathematics is just that universal science that deals with order and measurement generally." Burtt also asserts that "Descartes is at pains carefully to illustrate his thesis that (p.133) exact knowledge in any science is always mathematical knowledge."¹²⁶ He refers to the Rule 3 concepts of intuition and deduction (deduction now considered as mathematical deduction) as two steps of this mathematical method and introduces the simple natures of Rule 14 "as discoveries of intuitions."¹²⁷ However, this is where Burtt thinks Descartes goes astray: "As he proceeds from this point he is on the verge of the most far-reaching discoveries, but his failure to keep his thought from wandering, and his inability to work out the exceedingly pregnant suggestions that occur to him make them barren for both his later accomplishments and those of science in general. ... [A]t the crucial points his thoughts wander, and as a consequence Cartesian physics had to be supplanted by that of the Galileo-Newton tradition."¹²⁸ The rest of Burtt's account consists of a generally negative report of Descartes' views in the Principles-Descartes' "soaring speculations"—as failing to live up to his initial fundamental mathematical intuition, producing something of mere historical, not scientific significance.

It is ironic that Burtt is so firmly convinced of his interpretation of Descartes, based on a reading of a juvenile unfinished manuscript, that he cannot make much sense of the Principles, Descartes' mature published treatise, on which his reputation rested during the seventeenth century. The situation, however, is not much better with Dijksterhuis, though the latter is somewhat more sober than the former. Again, he asserts that in seventeenth-century science "the structure of the external world was essentially mathematical in character and a natural harmony existed between the universe and the mathematical thought of the human mind." Dijksterhuis adds that "the standpoint taken by Descartes cannot be better described than by saying that by carrying this conception to its extreme he virtually identified mathematics and natural science."¹²⁹ He then refers to Descartes' tree of philosophy. He recognizes that physics there is depicted as rooted in metaphysics, and that "Mathematics is not referred to," but he adds that the foundation on which metaphysics is based is also not referred to, and ends with a rhetorical question: "Cannot the explanation of this be that it is mathematical thought, considered not with regard to its contents but to its form, which constitutes this foundation?"¹³⁰ I suppose rhetorical questions should not be answered, though the answer is clearly "no."¹³¹ Still, to his credit, Dijksterhuis knows that one cannot find the thesis of the mathematization of nature in Descartes' first published work, the Discourse. He rightly states that "the formulation of the four famous rules which are recommended as guiding principles for scientific thought is immediately preceded by the statement that the author failed to find the method he needed in the Analysis of the Ancients and the Algebra of the (p.134) Moderns."¹³² He opines that Rule 1 of the Discourse, about evidence, "was

apparently inspired by the style of mathematical thought," and adds that "the other three rules have been kept so vague and general that in the first place they admit of different interpretations and secondly they contain little that is of specifically mathematical character."¹³³ Dijksterhuis cites with approbation Leibniz's calling them vacuous and mocking them, describing the method as like advising a chemist to "take what you have to take, do with it what you have to do, and you will get what you desire."¹³⁴

However, Dijksterhuis is quickly over his disappointment with Descartes' Discourse: "in order to become really acquainted with the method of Descartes one should not read in the first place the charming *Discours*, which is a *causerie*, rather than a treatise, but the ... Rules for the Direction of the Mind, which was already composed in 1629."¹³⁵ And, naturally, we now get the fact that the Rules contains an exposition of Mathesis Universalis, which, Dijksterhius asserts, "Descartes always regarded as one of his greatest methodological discoveries." At this juncture Dijksterhius claims that Descartes wanted to see *Mathesis Universalis* applied in all the natural sciences, by which he means that Descartes prescribes the application of algebraic methods to all those branches of science that admit of quantitative treatment. He adds that Descartes also admits the possibility of "arranging propositions in deductive chains," so he concludes that "the aim of the Cartesian method is indeed to cause all scientific thinking to take place in the manner of mathematics, namely by deduction from axioms and by algebraic calculation."¹³⁶ Dijksterhuis in this way rejoins the thesis of the mathematization of nature and Burtt's account. He shares Burtt's disappointment with Descartes: "Descartes did not get very far in carrying out the concrete program of universal mathematics in science," though he asserts that "his metaphysical as well as his scientific thinking always followed a mathematical pattern."¹³⁷ The rest is a litany of Descartes' failures; that is, more analyses of Descartes from the perspective of the present: "if Descartes could have foreseen the future of mathematics ... "; "Descartes never produced ... "; "The modern reader, who is accustomed to find more and more trouble expended on this part of the process of forming scientific concepts, may have some difficulty in looking upon the Cartesian way of studying science as a serious contribution to the methodology of scientific thought." For Dijksterhius, as for Burtt, Cartesian physics is of mere historical importance; for Dijksterhuis, it was "an illusion" that enabled Descartes "to put before his contemporaries the transparent ideal of a rational system for the interpretation of nature that was to rely on none but mathematical and mechanical conceptions."¹³⁸

Of course, Descartes did not put before his contemporaries any such ideal as described by Dijksterhuis and Burtt. He put before his contemporaries the arguments of the *Discourse, Meditations,* and *Principles,* but not those of the *Rules,* which was **(p.135)** left unpublished until its Dutch-language version in 1684 and Latin-language version in 1701. The main Cartesians published their works before the wide dissemination of the *Rules,* around 1654–94, without any knowledge of its views. One might be able to argue that an analysis of the *Rules* in the fashion of Burtt and Dijksterhuis could reveal Descartes' deepest intuitions, but such an analysis cannot provide any understanding of Descartes' significance or influence for Cartesians or for anti-Cartesians or for seventeenth-century science in general. This is an important point to make. A subsidiary point is that the interpretations of Dijksterhuis and Burtt about the *Rules* are deeply flawed. Take Burtt's assertion that "all that we know in a science is the order and measurement revealed in its phenomenon" or "Descartes is at pains carefully to illustrate his thesis that exact knowledge in any science is always mathematical knowledge." When Descartes gives an example of his method in the *Rules*, he talks about the problem of determining the anaclastic line, in which parallel rays are refracted in such a fashion that they all meet at a point. He does explain that those who limit themselves to mathematics alone cannot investigate the problem, "since it does not belong to mathematics, but to physics."¹³⁹ A person who "looks for the truth in any subject" will not fall into the same difficulty. That person can perceive clearly by intuition both mathematical and physical matters, about the proportion of the angles of incidence and angles of refraction depending on the variation of these angles in virtue of the difference of the media and about the manner in which rays penetrate into a transparent body. The latter presupposes that the nature of illumination is known and what a natural power is in general. As Descartes says: "this is the last and most absolute term in this whole sequence."¹⁴⁰ It is the intuition from which the problem will be solved, from which evident knowledge of the anaclastic line is derived, according to Descartes' method.¹⁴¹ It is difficult to see how the intuition about the nature of illumination or of a natural power would not be considered knowledge or has to be thought as mathematical knowledge, as Burtt would want it. Nor can this license Dijksterhuis' claim that: "the aim of the Cartesian method is indeed to cause all scientific thinking to take place in the manner of mathematics, namely by deduction from axioms and by algebraic calculation."¹⁴² Burtt and Dijksterhuis are so sure of their general thesis about the mathematization of nature that they construct their own Descartes from an unfinished manuscript that Descartes himself never refers to; they then mostly neglect what he says in his mature published works. Worse yet, they are so sure of the mathematization of nature as the endpoint for physics that they criticize Descartes for failing to see what they think they perceive in present science. In this process, they cannot provide any understanding of Descartes' views nor of what the Cartesians saw in Descartes.

(p.136) There are numerous pronouncements in Descartes' corpus that he is looking for certainty at least equal to that of mathematics; in the *Discourse*, he intimates that the real use that can be made of mathematics is to extend its method into other realms,¹⁴³ and to prepare the mind to follow the real philosophical method, which mathematics presupposes.¹⁴⁴ This last statement can lead one to consider that Descartes does not accept mathematics as the *foundation* for all knowledge. In fact, early on he claims that his metaphysical demonstrations are more certain than geometrical demonstrations.¹⁴⁵ But Descartes does say that all his "physics is nothing other than geometry,"¹⁴⁶ and he speaks of "having reduced physics to the laws of mathematics."¹⁴⁷ That is how Descartes' anonymous correspondent in the letters used as a preface to the *Passions of the Soul* understood Descartes: "the [Scholastic] Philosophers accept mathematics as part of their physics is a part of mathematics."¹⁴⁸

There is also the last article of Principles, part II (art. 64) already cited: "The only

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principles I accept or desire in physics are those of geometry or abstract mathematics, because these explain all natural phenomena and enable us to provide certain demonstrations of them."¹⁴⁹ It is an important article indeed, which Descartes published in a prominent work. What the text of the article explains is that Descartes recognizes "no matter in corporeal things apart from what can be divided, shaped, and moved in all sorts of ways, that is, the one the geometers call quantity"—that "he considers in such matter only its divisions, shapes, and motions"-because he does not want to admit anything as true "other than what has been deduced from <these> indubitable common notions so evidently that it can stand for a mathematical demonstration." Descartes ends his article by asserting: "since all natural phenomena can be explained in this way, I do not think that any other principles are either admissible or desirable in physics <than the ones that are here explained >." It is important to note that the properties of matter that Descartes accepts, the divisions, shapes, and motion of corporeal things, (p.137) are not accepted because they are geometrical or mathematical, but because they are the modes of extension that can be distinctly known. In part I of the Principles-that is, the "metaphysical" portion of the *Principles*, representing the *Meditations*—Descartes asserts that extended substance can be clearly and distinctly understood as constituting the nature of body¹⁵⁰ and that extension as a mode of substance can be no less clearly and distinctly understood as substance itself.¹⁵¹ Descartes then lists the properties or attributes of extension as their shapes, the situation of their parts, and their motions.¹⁵² It happens that these properties are what "the geometers call quantity." But that is because mathematicians rely on some of the same clear and distinct perceptions as natural philosophers do. Descartes roots his physics in a metaphysics that produces, at first, a physics that looks the same as mathematics, not because it is rooted in mathematics, but because it is rooted in a metaphysics of clear and distinct ideas.¹⁵³ It is unlikely that scholars would have been tempted to call this the mathematization of nature or have considered it as an integral part of the "Scientific Revolution."

Hypotheses and Moral Certainty

As Descartes fully understands, the new matter theory explains the behavior of sensible bodies by reference to imperceptible particles. So the question arises, how can we arrive at the knowledge of the shapes, sizes, and motions of these particles? The answer involves the epistemic status of hypotheses, but the role of hypotheses in Descartes' philosophy is not clear, or it seems to have undergone some change, and the Cartesians do not seem to have accepted Descartes' view fully. Now, it has already been pointed out that Descartes was not as a-prioristic about scientific method and the use of hypotheses as is usually thought, or at least that he became less so in his later vears, ¹⁵⁴ and that the Cartesians, while maintaining Descartes' propensity for mechanistic explanations, became more empirical and pursued aggressively a quasi-hypothetico-deductive method.¹⁵⁵ But the motivations for these shifts are not clear: it is not useful to treat Descartes and the Cartesians as sleepwalkers, darkly perceiving the hypothetico-deductive nature of science, as has sometimes been done. Science may or may not have a single method; hypothetico-deductivism may or may not be that method. Even if it were, this in itself could not explain why the Cartesians accepted some form of it, if they did. So I investigate the various uses Descartes and, later, the Cartesians made of hypotheses and the

reasons they gave for those uses. A fair portion of my discussion concerns Descartes' notion of moral certainty, which Descartes uses to distinguish between non-hypothetical first principles about general things and hypothetical ones about particular things. Descartes' usual view was that **(p.138)** his hypotheses could be grounded in non-hypothetical, self-evident principles, that he had or could provide such a derivation. By the time he was writing part IV of the *Principles* he knew that such a demonstration would be futile. Descartes' opinion there is that his hypothetical principles are not absolutely, but merely morally certain, meaning that there is at least some logical connection and coherence in them, such that his physics would have to be rejected and taken only as a fiction, or else it all has to be accepted, and not be rejected until another is found more capable of explaining all the phenomena of nature. The key concept for Descartes is thus "moral certainty," a term he consciously borrows from the late Scholastics. I attempt to understand Descartes' concept by reference to contemporary Scholastics' texts (mostly from their Logic), namely those of Roderigo Arriaga, Eustachius a Sancto Paulo, and Francisco Suárez.

There are significant discussions of the status of hypotheses in Descartes' Principles, parts III and IV. There, Descartes indicates that he is aware of the long tradition of hypotheses in astronomy and relates his own use of hypotheses to it.¹⁵⁶ On the basis of the relativity of motion at the phenomenal level, Descartes simply claims that the question about whether the earth is in motion cannot be fully resolved by appearances. As a result, astronomers have invented three different hypotheses to account for the phenomena: those of Ptolemy, Copernicus, and Tycho.¹⁵⁷ Descartes then rejects Ptolemy's hypothesis as not adequate to account for all observations and in particular for the recently observed phases of Venus.¹⁵⁸ Descartes asserts that the choice between the other two hypotheses is underdetermined by the appearances.¹⁵⁹ He gives preference to Copernicus' hypothesis over Tycho's on grounds of "simplicity" and on the fact that Tycho "has not sufficiently considered the true nature of motion."¹⁶⁰ Descartes proceeds to prefer his own (pseudo-Copernican) hypothesis on the same grounds: he is proposing the hypothesis that seems to him "the simplest, most true, and most useful for knowing the phenomenon as well as for enquiring into natural causes."¹⁶¹ He specifically warns his reader he is not claiming that his "hypothesis should be received as entirely in conformity with the truth, but only as a hypothesis <or supposition that could be $false > "^{162}$

Later on, in *Principles*, III, Descartes considers more generally all hypotheses, not just those given in astronomy. He argues that it is not likely that the causes from which all the phenomena can be deduced are false: as long as he "has used evident principles, deduced the results by mathematical reasoning, and accounted exactly for all experience, it would be injurious to God to believe false the causes of the natural effects discovered in this way."¹⁶³ Still, Descartes does not want to assert that all the hypotheses proposed by him are true. He prefers people to take what he has written "as a hypothesis that could be quite distant from the truth."¹⁶⁴ However, he indicates that if what **(p.139)** is deduced from his hypothesis is in conformity with experience, then the hypothesis "would be no less useful to life than if it were true,
because we could use it in the same

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way to produce the desired effects>."¹⁶⁵ He even asserts that he will assume some hypotheses he believes to be false; he allows himself to imagine some simple and intelligible principles that are contrary to the account of creation from Genesis, which he takes to be true.¹⁶⁶ Descartes thinks that all the bodies in the universe are composed of the same matter, a matter divisible into parts that are variously moved in circular motions, and that there is always an equal quantity of motion in the world. But he cannot determine how large are the parts into which the matter is divided, nor with what speed they move, nor what circles they describe. "These things could have been ordered by God in an infinity of ways and it is only by experience <and not the power of reason> that one can know which way he has chosen from all of these." That is why Descartes believes he is free to assume whatever he wishes about the division of the parts and their motion, as long as what he deduces from his hypothesis "agrees <entirely> with experience." And he proceeds to assume that God at first divided the matter into equal parts, etc., something he knows contradicts Genesis, but which is a simpler and more intelligible supposition.¹⁶⁷ Descartes' whole doctrine can be summarized by his comment to the Jesuit Denis Mesland in a 1645 letter about the *Principles*:

I dare say that you would find at least some logical connection and coherence in it, such that everything contained in the last two parts [that is, *Principles*, III and IV] would have to be rejected and taken only as a pure hypothesis or even as a fable, or else it all has to be accepted. And even if it were taken only as a hypothesis, as I have proposed, nevertheless it seems to me that, until another is found more capable of explaining all the phenomena of nature, it should not be rejected.¹⁶⁸

Yet, prior to the 1640s, Descartes had another view. Descartes discusses the status of hypotheses in the 1637 Discourse on Method and in two of its appended essays, the *Dioptrics* and *Meteors*. At the end of the *Discourse*, referring to the hypotheses he used at the beginning of the two essays, he says that people should not be shocked by the fact that he calls some things "suppositions" and that he does not seem to want to prove them.¹⁶⁹ He asserts, "I only called the things suppositions so that it can be known that I think I can deduce them from the first truths I have previously explained, but that I wished expressly not to do it"----and this because he did not wish to reveal everything at once.¹⁷⁰ It is the main difference between the accounts of the *Discourse* and of the Principles. In the Principles, Descartes would not have promised a derivation of his hypothetical principles from his first truths, but would have argued only for the coherence of the whole lot. And, indeed, in the Meteors, Descartes uses principles he claims have not been sufficiently (p.140) explained as yet; he calls them "suppositions," declares that he will be able to render them so extremely simple and easy that it will not be difficult to believe them, and refers to the use he has made of such suppositions about light in the *Dioptrics*.¹⁷¹ There he divulges that he will not be talking about the *nature* of light, but will be using some comparisons that "would help in conceiving it in the easiest way ... imitating in all this the astronomers whose suppositions are almost all false or uncertain ... and yet allowing one to derive consequences from them that are true and certain."¹⁷²

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In a series of letters from 1638, the astrologer Jean-Baptiste Morin objected to Descartes' treatment of hypotheses. He agreed that the appearances of the celestial movements can be derived from the supposition of the earth's stability as well as from the supposition of its mobility and claimed that experience is not sufficient to prove which of the two causes is the true one. But he challenged Descartes, asserting that if his suppositions are not any better than those of the astronomers he is imitating, he is going to do no better than them—perhaps even worse: "there is nothing easier than to adjust some cause to an effect."¹⁷³ Descartes responded to Morin in the same way he responded to others then. In a letter to a Jesuit, Descartes insisted that he was speaking hypothetically about light in the *Dioptrics* precisely because he had explained the matter "in a most ample and most curious manner" in the treatise he called On Light, and did not want to repeat himself, but only wanted to represent an idea by means of comparisons and "shadows."¹⁷⁴ This was, of course, an exaggeration by Descartes, because the treatise in question, now known as Le Monde, in which he claimed to have explained the matter amply, was itself a treatise that proceeded hypothetically. Descartes even referred to the treatise as a fable in a letter to Mersenne of 1630,¹⁷⁵ and in the work itself, as it has come down to us, Descartes says that he will shorten his account by using a fable, in which he hopes the truth will still come through sufficiently,¹⁷⁶ and he states that he does not promise to give exact demonstrations of everything, that he will draw a picture with shadows, as well as with clear colors, having no intent other than to relate a fable.¹⁷⁷ As late as 1638, responding to Mersenne about whether what he has written about refraction is a demonstration, Descartes answers that he believes it to be so, "at least to the extent that it is possible to give demonstrations in that matter without having demonstrated the principles of physics by metaphysics,"¹⁷⁸ and he adds, parenthetically, that this is what he hopes to do one day, but it is something that has not vet been done. To Morin, Descartes replies by agreeing with what he asserted, but claiming that "the effects I explain have no other causes than the ones from which I deduce them, even though I reserve to myself the right to demonstrate this in another place."¹⁷⁹

(p.141) The difference between Descartes' position circa 1637 and his position circa 1644 is that by 1644 Descartes has given up the possibility of deriving all his principles with the same kind of self-evidence and certainty.¹⁸⁰ He still thinks that some of his principles are certain and not mere hypotheses, but accepts others as inevitably hypothetical. In 1637 he was claiming that he could ground the hypothetical principles in non-hypothetical, self-evident ones, that he had or could provide such a derivation. By 1644 he knew that such a demonstration would be futile. The argument does not seem to change in other respects. There are obviously differences in the historical situations between the two periods. In 1637, in the aftermath of Galileo's condemnation, Descartes was publishing only the portion of his physics that he thought would not be controversial and burying the rest of it; in 1644, after having issued the *Meditations*, Descartes was confident enough to publish all of his physics, including its metaphysical foundations. But Descartes was at his most publicly confident self in the earlier period, where he was promising more, though claiming that the more was given in a work he was not publishing.¹⁸¹

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At the end of *Principles*, part IV, Descartes reflects generally on the method he uses in his physics and compares it with that of others. First he claims that he has not used any principle not accepted by all the philosophers of every age, including Aristotle. He has "considered the figure, motion and magnitude of each body, and examined what must follow from their mutual concourse according to the laws of mechanics, confirmed as they are by certain and daily experience."¹⁸² According to Descartes, no one has doubted that "bodies were mixed and have diverse magnitudes and figures, according to the diversity of which their motions also vary, and that from mutual collision those that are larger are divided into many smaller, and thus change their figure." The difference between his approach and that of others is that he considers that "there are many particles in each body which are so small that they cannot be perceived with any of our senses."¹⁸³ Descartes then deals with the question of the nature of these unsensed bodies. Among other things, he rejects the Democritean "suppositions" that the minute bodies are indivisible and that there are voids around them, calling these suppositions (p.142) inconsistent. But, he reiterates, "for no one can doubt that there are in reality many such particles."¹⁸⁴ He declares that he leaves it to others to judge whether his suppositions have been consistent. In the French edition of the *Principles*, he also adds that he leaves it to others to decide whether the results that can be deduced from his suppositions have been "sufficiently fertile"; he asserts that he rejects "all of Democritus" suppositions," with the one exception of "the consideration of shapes, sizes, and motions," and rejects "practically all the suppositions of other philosophers" as well.¹⁸⁵

In the 1647 French edition of the Principles, Descartes describes the method he has used with respect to his suppositions. He has first considered in general all the clear and distinct notions the understanding can contain with regard to material things-those of shapes, sizes, and motions—and the rules in accordance with which these three things can be modified by each other—that is, the principles of geometry and mechanics. So he has concluded that all the knowledge people have of the natural world must be derived from these notions. Next he has deduced the principal differences between the bodies that are imperceptible by the senses merely because of their small size and the observable effects that would result from their various interactions. Then, when he has observed just such effects as perceived by the senses, he has concluded that they in fact arose from such an interaction of bodies that cannot be perceived—"especially since it seemed impossible to think up any other explanation for them."¹⁸⁶ His legitimation for this seemingly abductive procedure is an analogy: people who are experienced in dealing with machinery like a clock "can take a particular machine whose function they know and, by looking at some of its parts, easily form a conjecture about the design of the other parts, which they cannot see."¹⁸⁷

Descartes extends his analogy about such machines as clocks to make clear the limitations of the explanations of phenomena referring to corpuscles our senses do not perceive. Two clocks identical on the outside may indicate the time equally well but use different operating mechanisms. So also God could have produced the phenomena we perceive in innumerably different ways. As a result, the causes postulated by Descartes to explain some effects may correspond to the phenomena manifested by nature, but may not be

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the ones by which God produced those effects: "With regard to the things that cannot be perceived by the senses, it is enough to explain their possible nature, even though their actual nature may be different."¹⁸⁸ These explanations, according to Descartes, are only morally certain; that is, they suffice for the conduct of life, although, given the absolute power of God, they can be doubted. In the French edition of the Principles, Descartes adds: "Thus those who have never been in Rome have no doubt that it is a town in Italy, even though it could be the case that everyone who has told them this has been deceiving them."¹⁸⁹ In this way Descartes distinguishes between two kinds of certainty, one he calls moral (and perhaps physical), and another he calls (p.143) absolute (or mathematical). The situation is different for absolute certainty, which, according to Descartes, we possess for mathematical demonstrations, the knowledge that material things exist, and the evidence of all clear reasoning that is carried on about them: "Absolute certainty arises when we believe that it is wholly impossible that something should be otherwise than we judge it to be."¹⁹⁰ So absolute certainty accrues to metaphysical principles that have passed the test of hyperbolic doubt and to the general physical principles that can be derived from them. Moral certainty accrues to the physical principles about particular things that cannot be perceived. We do not have real doubts about these principles, but they fail the test of hyperbolic doubt, because we understand that God could have brought about things in some other way.

Descartes uses another example to illustrate moral certainty. He refers to a codebreaker who has decoded a message and who is certain of his solution, but who understands that another solution might be possible. He states: "he may discover this by conjecture, and although it is possible that the writer ... concealed another meaning in it, this is so unlikely to occur that it seems incredible."¹⁹¹ Descartes adds in the French edition: "especially when the cipher contains many words." He concludes, cashing in his analogy: "But they who observe how many things regarding the magnet, fire, and the fabric of the whole world, are here deduced from a very small number of principles, although they considered that I had taken up these principles at random and without good grounds, they will yet acknowledge that it could hardly happen that so much would be coherent if they were false."¹⁹² Still, Descartes argues that, at bottom, his explanations "possess more than moral certainty," because at least the most general results have been deduced in an unbroken chain from the first and simplest principles of human knowledge.¹⁹³ Descartes' promise to provide a derivation of his principles from self-evident ones remains, but it is now limited to the general principles given in parts I and II; those of parts III and IV about the nature of particular things are now irremediably hypothetical; that is, just morally certain, as opposed to absolutely certain.

There has been a fair amount of commentary about moral certainty, but I think Descartes' concept is still not fully understood. I wish to provide evidence for three claims about moral certainty in Descartes: (1) Descartes frequently used the concept before his formal definition of it in the *Principles*—he did so even in 1637–8, when he was claiming to Morin that the effects he explained had no causes other than the ones from which he deduced them—thus, to call something morally certain was a commonplace in Descartes' vocabulary before 1644 (as it was after). (2) Descartes borrowed the concept

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from the Schoolmen, for whom it was also a commonplace—though, of course, he made it his own (this is not to deny that there could be some evolution, as well as some nonformal uses of the concept in Descartes). And (3) against **(p.144)** most commentators, despite what could be inferred from Descartes' examples of code-breaking and of knowing where Rome is, moral certainty should not be equated with high probability.

An important instance in which Descartes claims to have reached moral, not absolute certainty is the case of animals and machines, described in the *Discourse*. We have moral certainty that an entity using language or acting through knowledge, "imitating our actions as closely as morally possible," will be human, and not animal or machine: "for it is morally impossible for there to be enough different organs in a machine to make it act in all the contingencies of life in the same way as our reason makes us act."¹⁹⁴ In case one is wondering whether these passages should be understood in some way other than Descartes' asserting that we have moral certainty of these possibilities or impossibilities, there is another passage in the *Discourse* where Descartes makes clear use of moral certainty in the standard way. He argues:

If there still are men who have not been sufficiently persuaded of the existence of God and of their soul by means of the reasons I have brought forward, I very much want them to know that all the other things of which they think themselves perhaps more assured, such as having a body, that there are stars and an earth, and the like, are less certain. For although one might have a moral assurance about these things,¹⁹⁵ which is such that it seems one cannot doubt them without being extravagant, still when it is a question of metaphysical certitude, it seems unreasonable for anyone to deny that there is not a sufficient basis for one's being completely assured about them.¹⁹⁶

Descartes' claim that we have only moral certainty about there being stars and an earth seems at odds with his claim that we can know that the effects he explains about such things as the stars and the earth can have no other causes than the ones from which he deduces them. But still, that is what his promise of a deduction would seem to indicate.

There are other interesting instances of moral certainty in Descartes' correspondence from the period before 1644–5. In very much the same fashion as with the *Discourse* question about the kind of certainty we have that an animal cannot perfectly imitate our actions, Descartes claims that a machine cannot fly like a bird: "A machine that can be sustained in the air like a bird can be constructed metaphysically speaking—for, according to me, birds are such machines—but not physically or morally speaking, because there would have to be springs so subtle and so strong collectively that they could not be fashioned by men."¹⁹⁷ He also refers to an experiment as "morally impossible";¹⁹⁸ he says that it is "morally impossible" to remove all the printers' errors from his manuscript;¹⁹⁹ and he rejects the objection that according to his philosophy we would have no certainty that a priest is holding a host at the altar, for, Descartes (**p.145**) says, "Who has ever said, even among Scholastic philosophers, that there was more than moral certainty about such things?"²⁰⁰

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In his published work, in a passage of the *Sixth Set of Replies*, referring to the creation of the eternal truths, Descartes talks about a king being "the efficient cause of a law, although the law itself is not a thing that has physical existence, but is merely what they call a moral entity."²⁰¹ "Moral" here has nothing to do with morality or ethics, but indicates that the entity is less than real in the same way that moral certainty is a grade of certainty less than absolute. Moreover, in the *Seventh Set of Replies*, Descartes defends himself against the charge that in the *Meditations* he claimed some knowledge when he said he knew that there was no danger in his renouncing his beliefs: "in that passage I was merely speaking of knowing in the moral way which suffices for the conduct of life. I frequently stressed that there is a very great difference between this type of knowledge and the metaphysical knowledge that we are dealing with here."²⁰²

Descartes continues using the concept after 1644–5, with some interesting variations. He refers to the result of an experiment as "something that cannot happen morally."²⁰³ He talks about "physical and moral causes, which are particular and limited, as opposed to a universal and indeterminate cause."²⁰⁴ He refers to reasons as "being neither mathematical, nor physical, but only moral,"²⁰⁵ and to knowing that we have "examined matters as far as we are morally able."²⁰⁶ In an extremely important letter to Mesland, Descartes asserts that "when a very evident reason pulls us to one side, even though, morally speaking, we cannot choose the opposite side, absolutely speaking, however, we can."²⁰⁷

Two of the instances of the use of the qualifier "moral"—Descartes saying that we have a moral not metaphysical certainty about there being stars and an earth, and his referring to a moral entity, as opposed a physical one—are translated in different places with some added phrases, the first, "*ut loquntur Philosophi*," in the *Specimina*; that is, in the Latin translation of the *Discourse*, and the second, "*comme ils disent en l'École*," in the French translation of the *Sixth Replies*. In these cases, the translators (Étienne de Courcelles for the *Specimina* and Claude Clerselier for the *Objections and Replies*) are indicating what seems obvious to them, that the phrase has been borrowed from Scholastic terminology. That does seem fairly clear; in fact, the distinction becomes so commonplace that it gets codified in the first edition of the *Dictionnaire de l'Académie française*, though considerably weakened so that moral certainty becomes "apparent (**p.146**) certainty" and seems allied with probability: "One says 'moral certainty' so as to say verisimilitude or apparent certainty; and then 'moral' is in opposition to 'physical.' Thus one says, 'You are not given physical certainty, but there is some moral certainty in this.' ... One says 'morally speaking,' so as to say 'verisimilously and according to all the appearances.'"²⁰⁸

There is an interesting passage in which a three-fold distinction is made among moral, physical, and absolute certainty in Roderigo Arriaga's 1632 *Cursus philosophicus*:

Certainty is three-fold, moral, physical, and metaphysical. Moral certainty is what we have when our reasons are indeed fallible physically, though infallible morally speaking, i.e., almost infallible, as, for example, the certainty I have about the existence of Naples, from what has been said by so many knowledgeable and honest men who assert it and make me certain that Naples exists, although,

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because it is not physically impossible that they should all lie, I am not physically certain of this existence. ... Physical certainty is what rests on physical principles which cannot, in accordance with the nature of the thing, be otherwise, as, e.g., the certainty I have about Peter's running, which I see; for the thing really can be otherwise, at least by [God's] absolute power, insofar as God can miraculously make it appear to me that Peter is running, even though he is not really running; and he can do the same in other matters; therefore that certainty is not called metaphysical and supreme, but natural or physical. Finally, metaphysical certainty is that by which the object is presented in such a way that in relation to every power it cannot be otherwise, as the certainty I have about God's existence, or about such principles as *Each thing either is or is not*, or *Things which are the same as a third thing are the same as each other*, and the like, or about all the mysteries revealed by God, which cannot be false, even in relation to God's absolute power.²⁰⁹

Moral certainty is defined and illustrated, in Arriaga's three-fold distinction, in the same way as Descartes defines and illustrates it—though Descartes uses Rome, not Naples, as his example of moral certainty. Descartes also plays with a three-fold distinction—he talks of reasons being neither mathematical, nor physical, but only moral—though ultimately he defines just moral and absolute certainty. He can probably make room for physical certainty in the fashion of Arriaga—something that rests on physical principles that cannot be otherwise without invoking God's absolute power—but he would not think that seeing Peter running is certain in that way. Thus physical certainty for Descartes would seem to collapse into moral certainty or no certainty at all. Arriaga's distinction is also interesting because of where it is given in his philosophical (**p.147**) course. It occurs in part 1, *Logic*, just after the discussion of syllogism, in an examination of demonstration and the certainty provided by it, together with a discussion of the differences among demonstrative science, opinion, and faith. Arriaga talks about three degrees of certainty in demonstrative science, but carefully distinguishes the certainty we obtain in science from the opinion we derive from probable reasoning.²¹⁰

Given Descartes' distaste for Scholastic logic, it seems unlikely that he would have read these passages directly, but likely that he would have been acquainted with the general views represented. Eustachius a Sancto Paulo's *Summa Philosophiae Quadripartita* does not provide a discussion of the kind of certainty we obtain through demonstration, but does provide one about the differences among science, opinion, and faith, with clear implications for there being different kinds of certainty:

We may ask how demonstrative science is related to opinion and faith. The three are alike in being capable of truth ... but with this difference, namely, that science is a state that is always true, while opinion and faith can be false. Then again, science and opinion rely on reason—science on necessary reason, opinion on probable reason—while faith relies on authority alone. Faith is a condition that has two aspects, one directly implanted, and called divine faith, and the other acquired, and called human faith. The former is always certain like science, because it depends on

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divine authority, which can never deceive or be deceived; but the latter can be doubtful, like opinion, because it depends on human authority, which can both deceive and be deceived. ... Now the three conditions are distinguished in terms of their objects, insofar as science relates to something that is necessary in virtue of its cause, while opinion relates to something that is probable by reliable signs, and finally faith relates to something testified by authority. And hence the three are distinguished in virtue of their corresponding acts: by science we know, by opinion we conjecture, and by faith we believe.²¹¹

Eustachius continues by arguing that it may happen that we have science, opinion, and faith with respect to the same thing, although the means we employ are different: It is science if the thing is demonstrated by necessary reason, opinion if it is inferred merely by probable reasoning, and faith if it is believed because of the authority of the testifier. Hence these three conditions can all be present in the same intellect with respect to the same thing. Since science and faith can both produce certainty, certainty comes in different kinds.

For Arriaga as for Eustachius, science differs from opinion in that the former is certain while the latter is merely probable. And, similarly as well, for Arriaga faith is given either immediately and supernaturally or mediately and naturally. It can be merely probable, or it can be certain—that is, morally, not metaphysically certain—in the same way that one knows where Rome is.²¹² This discussion about the difference between science, opinion, and faith is common in Scholastic textbooks, as is the discussion of the **(p.148)** kinds of certainty science and faith can provide. The Jesuits of Coimbra also propose three kinds of certainty: what they call certainty of the object, of the known, and of the knower.²¹³ The first is the usual demonstrative certainty about necessary things and the third has to do with the firmness of the intellect in adhering to the thing as a truth, while the second makes room for the certainty of faith. This is also the background for Francisco Suárez's discussion of the knowledge of the existence of God being based mostly on faith, though accompanied by practical and moral certainty; that is, what he calls *moral* self-evidence:

this general notion is based on the tradition of the majority and is passed on from parents to children, from the more learned to the less. As a result, the general belief that God exists has grown and become accepted among all peoples. Hence this knowledge seems in large part to be due to faith, especially among the masses, rather than to the self-evidence of the matter; but it still seems to have been attended with practical and moral self-evidence, which is sufficient to oblige people both to assent to the truth of God's existence and also to propagate it. And accordingly we may easily understand everything that the Doctors of the Church say about knowledge of God being naturally implanted.²¹⁴

Suárez uses the concept of moral self-evidence or certainty without any fanfare, assuming the kinds of discussion common to the commentaries of the Conimbricenses, Eustachius, and Arriaga. In these discussions, moral certainty is a species of certainty, carefully distinguished from opinion and high probability.

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The same can be said for Descartes in his own way. It is tempting to think that moral certainty is high probability because of the examples of the code-breaker who decodes a message and the person who is told about Rome. Are we not more secure in our decoding, given that we have broken a larger code than a smaller one? Is it not relevant that we are told about Rome from many sources as opposed to a few? Still, moral certainty and high probability are usually distinguished, as they are in the discussions of Arriaga or Eustachius. And despite Descartes' examples, his moral certainty does not admit of any degree. The case for our being morally certain that we could not construct a machine that flies like a bird might look to us like a case of high probability, but for Descartes it is, like his other cases, something beyond the pale. Building such a machine would be so difficult that Descartes is morally certain that it could not be done by us, though God has done it; the same for constructing a machine that actually uses language. Moral certainty suffices for the conduct of life, but not in the sense that it is a good rule of thumb or something highly probable. As with the Scholastics, it is genuine certainty within its own sphere. If something is morally certain we lack any reason to doubt it, though we could doubt it if we considered God's absolute power. Descartes' two kinds of certainty are thus dependent on our being able to construct hyperbolic reasons for (p.149) doubt: Absolute certainty, the certainty attaching to his metaphysical principles and the principles about general things he deduces from them, passes that criterion, whereas moral certainty, the certainty attaching to physical principles about particular things, fails it.

3.4. Descartes' Two Ethics

Descartes' Ethics, from the Discourse to the Principles

Descartes describes his project to reconsider all of his opinions, his search for something firm and lasting in the sciences, in the *Discourse*. He uses there a metaphor of razing to the ground the building in which he is living, so as to rebuild it on new foundations. But, as he says, before beginning to reconstruct the house, one has to draw up plans—what Descartes does when describing his method in part II of the *Discourse*—and one has to have a place in which to live during the process. The latter consists of "three or four maxims"; that is, a "provisional code of morals,"²¹⁵ which Descartes describes in part III of the same work. Given his first maxim, "to obey the laws and customs of my country, constantly holding on to the religion in which, by God's grace, I had been instructed from my childhood,"²¹⁶ it is clear that Descartes thinks of building his system of knowledge as something to be done apart from matters of value and religion. He accepts the status quo in ethics, politics, and religion provisionally, bracketing such issues, until he has rebuilt his house; as he says: "When I had thus assured myself of these maxims and put them to one side along with the truths of the faith ... I judged that, as for the rest of my opinions, I could freely undertake to rid myself of them."²¹⁷

Descartes' second maxim reinforces his initial decision; he decides to be "as firm and resolute in my actions as I could, and to follow the most doubtful opinions, once I had decided on them, with no less constancy than if they had been very well assured."²¹⁸ His third rule, however, looks to be somewhat different than the first two; Descartes states,

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"My third maxim was always to try to conquer myself rather than fortune, and to change my desires rather than the order of the world."²¹⁹ Descartes concludes his "morals" with a determination "to review the various occupations that men have had in this life, in order to try to choose the best one."²²⁰ This last element is yet of another kind than the first three; as we have said, Descartes refers to "three or four maxims," and later on, he will speak of "the three rules of morality that I put forward in the *Discourse* (**p.150**) on *Method.*"²²¹ The fourth set of considerations ultimately is not a new element of the provisional moral philosophy, but encompasses a discussion of the suitability of the first three maxims for Descartes' project, which is to reform his knowledge or to reconstruct the house in which he is living.

Let us therefore treat Descartes' provisional or conditional code of morals as three maxims: the decision to obey the laws and customs of his country and to hold on to his religion; to be firm and resolute in his actions; and to conquer himself rather than fortune. Descartes indicates the origin of his third maxim when he provides its justification. According to Descartes, he needs to accustom himself to believe that there is nothing completely in his power other than his thoughts; this would prevent him "from desiring anything but what I was to acquire, and thus to make me contented."²²² He recognizes that in order to habituate himself to look at everything from this point of view he also needs to spend time on exercises; that is, to make frequent meditations. He confesses that it is principally in this "that the secret of those philosophers consists, who in earlier times were able to free themselves from fortune's domination and who, despite sorrows and poverty, could rival their gods in happiness. For occupying themselves ceaselessly with considering the limits prescribed to them by nature, they so perfectly persuaded themselves that nothing was in their power but their thoughts."²²³ It does not take much imagination to recognize that the "philosophers" to whom Descartes is referring are the Stoics and that Descartes is acknowledging the genesis of his third maxim as stemming from their teachings on morality. There was, in fact, a renaissance in Stoic philosophy at the end of the sixteenth, beginning of the seventeenth century; this resulted in the publication of a number of Stoic works, including French translations of Epictetus' Manual. Descartes was clearly well aware of these writings; later on he will freely discuss Seneca's Epistles in his correspondence with Princess Elisabeth.

The 1594 translation of Epictetus' *Manual* by Guillaume Du Vair was accompanied by a preface, *La Philosophie morale des Stoïques*, which Du Vair expanded and issued separately in 1600 and then again in his collected *Œuvres* published in 1619. There, one finds all the elements of Descartes' third maxim and some aspects of his second as well. Du Vair argues that "the good of man consists in his use of right reason, that is, in virtue, which is nothing other than the firm disposition of our will to follow what is honest and suitable."²²⁴ He disputes with those who argue that the good of man consists in health or wealth, since these are only means to an end and not the ultimate end for man. Our will alone is directed toward our good:

the well-regulated will wills only what it can; it will therefore prevent itself from willing what is not in our power, like having health, wealth, and honors.... It is a

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divine and inviolable law, promulgated from the beginning of the world, that if we want to have some good, we must give it (p.151) to ourselves. Nature has put the storehouse [of goods] in our mind; let us bring our will into our control and take from the storehouse whatever we would will.²²⁵

Du Vair concludes that "the good of man and the perfection of his nature consists in the right disposition of the will to use things that present themselves through reason"²²⁶ and he presages Descartes' maxim by asserting that to attain our good would require us to "so regulate our desire that it can follow only what is according to nature, and not what is contrary to it. Beyond our power are our bodies, our riches, our reputations, and, in a word, everything that does not depend on our will."²²⁷

Thus, as Descartes indicated, his third maxim is of Stoic origin; his second maxim may be so as well. His first maxim, however, derives from another, related tradition. Like so many of the other attitudes and poses of the Discourse, the first rule is indebted to Renaissance humanism, and especially to the works of Michel de Montaigne and Pierre Charron, French writers whose philosophies blend Pyrrhonian skepticism with Stoicism, and whose books Descartes is known to have read. According to Montaigne, "The wise person should withdraw his soul inward, away from the crowd, and allow it the freedom and power to judge things freely; but as for externals, he should wholly follow the received fashions and forms. ... For it is the rule of rules, and the general law of laws, that each person should observe those of the place he is in."²²⁸ And Charron echoes: "according to all wise persons, the rule of rules and the general law of laws is to follow and observe the laws and customs of the country one is in."²²⁹ Charron echoes as well aspects of what will become Descartes' second maxim: "in the external and common actions of life, and in what has an ordinary use, one should conform to and accommodate common practice.... I agree that people should adhere and hold on to what seems most likely, honest, useful, convenient."²³⁰ The difference between Descartes, on the one hand, and Montaigne and Charron, on the other, is that the latter are giving advice about how people should behave externally while remaining in repose internally, while Descartes is merely adopting some provisional maxims by which to live, while he is rebuilding his knowledge. He is not advancing the rules as particularly worthy or as well founded. Still, in his picking and choosing from previous morals, Descartes selects from the available, mostly pagan, ethical writings of the Stoics and Skeptics and does not sample anything from the Aristotelian or Scholastic; that is, Christianized Aristotelian side.

Having set out his provisional morality, Descartes proceeded to give, in part IV of the *Discourse*, a brief account of the deeply metaphysical and extraordinary meditations in which he was engaged. He began by contrasting his search for the truth with his adoption of the provisional code: "in matters of morality one must sometimes follow opinions that one knows to be quite uncertain, just as if they were indubitable"; in the search for the truth, however, it necessary to do "exactly the opposite, and reject as **(p.152)** absolutely false everything in which [one] could imagine the least doubt."²³¹ Descartes subsequently expanded the metaphysical account of part IV of the *Discourse* into the 1641 *Meditations* and then produced a more complete account, including both his

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metaphysics and his physics, in the 1644 *Principles*. A few years later, in the 1647 preface to the French edition of the *Principles*, he returned briefly to the question of the relation between the provisional morality and his system of knowledge, which he discusses in conjunction with the tree of philosophy.

The well-known metaphor makes explicit what was already assumed in the code of morals from the *Discourse*, namely that the code would remain provisional or applicable under some limited conditions until the formation of Cartesian metaphysics and physics—the roots and the trunk of the tree of philosophy. For Descartes, producing the ultimate morality is the purpose of philosophy; as he says: "living without philosophy is precisely to have one's eyes closed without ever trying to open them; … this study is more necessary for the regulation of our manners and for our conduct in life than is the use of our eyes in the guidance of our steps."²³² The fact that the ultimate morality comes in the end, however, does not necessarily entail that it will be different than the provisional morality, only that, whatever it turns out to be, it will be proven or founded on Cartesian philosophy. In the same passage, Descartes lists the primary elements of his philosophy as:

the first part is metaphysics, containing the principles of knowledge, among which is the explanation of the principal attributes of God, the immateriality of our souls, and all the clear and simple notions that are in us. The second is physics, in which, after having found the true principles of material things, we examine generally how the whole universe is composed, and then in particular what is the nature of this earth and of all the bodies most commonly found around it. ... It is then necessary to inquire individually into the nature of plants, animals, and above all of man, so that we may afterwards be able to discover the other sciences useful to man.²³³

For Descartes, then, the definitive code of morals is based on a complete knowledge of the sciences and metaphysics, including the science of human nature: (as with most Scholastics) morality is subalternated to what Descartes calls "physics," which includes the knowledge of plant, animal, and human nature, and which is in turn itself subalternated to metaphysics. The "most perfect moral science" Descartes envisions as the endpoint of philosophy will require an understanding of our nature as thinking things distinct from the material world, and a fully developed physics of matter in motion, plus an understanding of the mechanical operations of the material world. However, given that it comprises a branch of the tree of knowledge and is not just part of the trunk, moral philosophy may also contain elements that are proper to it alone, dealing with the human being viewed as a whole entity; that is, as the union of mind and body, and not just materially, as a physical body. It may thus have its own distinct subject matter, concerning the union between mind and body, itself not fully understandable in terms of physics. With this subject will come a genuine Cartesian-style anthropological science that, as John (**p.153**) Cottingham rightly comments, "would do justice to the inescapable fact that we are not merely incorporeal minds inhabiting an alien mechanism, but creatures whose welfare is, in a special and intimate way, bound up with the operations of the body, and with the feelings, sensations, and passions that arise from our embodied state."²³⁴

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Descartes unfolds some aspects of that new anthropology in his final treatise, *Passions of the Soul*. He introduces it as a work in which his "intent was not to explain the passions as an orator, nor even as a moral philosopher, but only as a physicist (*en physicien*)."²³⁵ The result is a detailed examination of the physiological basis for the occurrence of human emotions, together with the way these are presented to consciousness as passions of the soul, consisting of articles on the movements of muscles and animal spirits, on the will, perception, and imagination, but also on wonder, esteem and contempt, love and hatred, joy and sadness. Apart from this admittedly limited treatise and some private correspondence, Descartes did not treat of the ultimate morality. That would have been the end of our account, if it were not for the activity of Claude Clerselier, Descartes' literary executor, after his death in 1650.

Ethics in Descartes' Posthumous Publications

Among the Cartesian works Clerselier published posthumously were three volumes of correspondence. It seems clear that Clerselier was not just publishing a random selection of Descartes' letters, but was thinking of constructing Cartesian texts to fill the gaps in the extant corpus, starting with ethics. Although in his preface to the Correspondence Clerselier says that there is no order to his collection of letters—"I did not give much consideration to the order and sequence of the letters in general"-he titles his first volume "Letters of Descartes, in which are treated several fine questions concerning Morals, Physics, Medicine, and Mathematics," and begins the volume with a 1647 letter to Queen Christina on the supreme good, continuing with letters to Princess Elisabeth from 1645 about the happy life. Clerselier argues that his collection of Descartes' letters is equivalent to any other of Descartes' writings, ²³⁶ even though Descartes might not have thought to publish them, since "one should not fear the public censure of what is written for Princesses and for the most learned people in Europe." According to Clerselier, what is addressed to such people, who are esteemed for their rank, knowledge, or virtue, will assuredly be well considered and highly polished. He then asserts that the highest and most useful subject is without doubt the one that Descartes examines in his letter to Queen Christina, namely the topic of the supreme good, which he treated as well in the letters to Princess Elisabeth. Clerselier says:

Descartes allowed people to see, in these letters, that ethics was one of his most common meditations, and that he was not so powerfully engaged with the consideration of things that happen up **(p.154)** in the air, or with the inquiry into the secret paths nature observes in the production of its works here below, such that he failed to reflect frequently on himself, and ... to regulate the actions of his life, following the true reason. ... After this, I do not think that anyone will be able to accuse him of vanity in his studies, as being completely engaged with an inquiry into the empty things of which science fills the mind, instead of those that instruct and perfect man.²³⁷

Following Clerselier's volumes of *Letters*, and especially following their Latin translation published in 1668, there appeared a Latin-language work on Descartes' moral thought—Descartes, *Ethics*—printed in London in 1685.²³⁸ Descartes never wrote such a book,

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PRINTED FROM OXFORD SCHOLARSHIP ONLINE (www.oxfordscholarship.com). (c) Copyright Oxford University Press, 2015. All Rights Reserved. Under the terms of the licence agreement, an individual user may print out a PDF of a single chapter of a monograph in OSO for personal use (for details see <u>http://www.oxfordscholarship.com/page/privacy-policy</u>). Subscriber: University of Arizona Library; date: 12 September 2015 but the editor was able to put together a three-part treatise out of Descartes' own words from his correspondence²³⁹ and *The Passions of the Soul*. It may look as though the translator made a concerted selection from Descartes' correspondence, but in fact he was just following Clerselier's edition of it, in sequence, together with an abbreviated Latin version of the *Passions of the Soul*, with the physiological passages deleted. This manual became part of the curriculum at Cambridge University since it was republished numerous times there during the first four decades of the eighteenth century, and bound into a single volume together with the "Scholastic" ethics of Eustachius a Sancto Paulo (that is, part 2 of his Philosophy *Summa*) and the "Christian" ethics of Etienne de Courcelles.²⁴⁰ Thus, although Descartes himself did not issue publicly any work on the definitive morality, at least a portion of it was published in the seventeenth century, pieced together from his writings, as his mature views on the subject.

In the letter to Christina that starts Descartes' first volume of *Letters* and his *Ethics*, Descartes first delineates what is good in itself (in which case, God is the supreme good) and what is good for another. With what is good for another, there is what is good for us, what belongs to us and is a perfection for humans—that is, the set of all goods for the soul, body, and fortune-and what is good for each in particular. In the latter crucial (p.155) case this is a "firm will to do well and the contentment produced thereby." The obvious contrast here is the Aristotelian definition of good for man as the end of human actions, leading to the ultimate good as associated with man's function, whether taken naturally or, as the Scholastics often do, supernaturally. For Descartes, good is a perfection belonging to us; thus the greatest good cannot be connected with the goods of body and fortune, which do not depend upon us, but rather with the goods of the soul. In another letter, Descartes even criticizes Aristotle for having made the ultimate good consist in all the perfections, those of the body as much as those of the mind.²⁴¹ For Descartes, the goods of the soul are, in turn, associated with knowledge, which can surpass us, and with will, which is in our power. As a result, the supreme good is a "firm and constant resolution to do everything we judge to be best and to use all our power of mind to know these." Descartes says, "this by itself constitutes all the virtues; this alone really deserves all the praise and glory; this alone, finally, produces the greatest and most solid contentment in life." In this way, Descartes believes he reconciles Stoicism and Epicureanism, since he thinks the greatest good to be in both virtue (vigor of resolution) -or honor (being deserving of praise)-and pleasure (contentment).

The selection from Descartes' letters to Elisabeth reinforces these various points. Descartes distinguishes between good fortune, which is not in our control, and happiness, which is. He brings out an analogy of a vessel that can be filled to capacity with less liquid than another, because it has lesser capacity. Likewise we can be filled with contentment with what is in our control, like virtue and wisdom, without having to need anything external, like honors, wealth, or health (although these do bring extra contentment). Descartes continues, "each person can be content ... as long as he observes three things, to which the three rules of morality that [he] put forward in the *Discourse on Method* are related."²⁴² At which point he details the three maxims, which presumably are the foundations of the rules he had proposed in the *Discourse*. Instead of

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obeying the customs of his country, Descartes now proposes to attempt always to use his mind as well as possible to discover what he should do in all the circumstances of life. And instead of being as firm and as decisive in his actions as he could and follow even the most dubious opinions, he proposes to have a firm and constant resolution to execute everything reason advises him without allowing his passions or appetites to divert him. Again he places virtue in the firmness of this resolution. Descartes ends by having one consider that in this manner of conduct, according to reason, the goods we do not possess are entirely outside our power, which allows us not to desire them.²⁴³ In the Discourse, Descartes similarly proposed that we always try to master ourselves rather than fortune, and to change our desire rather than the order of the world. At this point (p.156) in the *Discourse*, he also proposed a review of all occupations at the conclusion of his moral code, so as to determine whether the maxims are appropriate for the course he set himself upon; that is, to reform his judgments. In the later ethics, Descartes instead continues with advice on how to achieve virtue, given that we are not just mind, but a mind united to a body, a composite being prone to illnesses and passions. Moreover, he tackles the subject of our imperfect knowledge and what we should keep in mind in order to be disposed always to judge well: that is, the existence of God, the nature of our souls, and our distinctness from every part of the universe. This latter thought contains as well the beginning of Descartes' social and political theories in that it distinguishes between the interests of the part and the interests of the whole and advises always to prefer the interests of the whole, of which one is a part, than one's own particular interests.²⁴⁴ It should be said that all of this proceeds naturalistically—that while values are now integrated into the branches of the tree of philosophy, religion is still bracketed aside on a separate, but parallel path.

This concludes my summary of Descartes' views on logic, metaphysics, physics, and ethics. It should have provided sufficient materials for us to appreciate what the first Cartesians constructed in relation to these subjects when they wanted to compete with the late Scholastics textbooks.

Notes:

(1) AT ixb. 13.

(2) AT ixb. 14.

(3) "distinguishing the sciences from one another by the diversity of their objects, men thought it proper to pursue each one of them singly to the neglect of all the others. But in this they are plainly mistaken. Since all the sciences are nothing but human intelligence, which always remains one and the same, however different the subjects to which it is applied, and which receives no more alteration from those subjects than does the light of the sun from the variety of things it illumines, there is no need to impose any boundaries upon the mind; nor, indeed, does the knowledge of one truth, like the practice of a single art, keep us from the discovery of another, but rather assists us. Indeed, it amazes me how most people study with the greatest diligence the customs of men, the properties of plants, the motions of the stars, the transformations of metals, and the objects of other

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such disciplines, while at the same time almost no one thinks about good sense, or about universal intelligence, although as a matter of fact all other things are to be valued, not for themselves, but because they contribute something to it. ... If therefore anyone wishes seriously to investigate the truth of things, he ought not to choose any single science; for they are all interconnected and reciprocally dependent. He should rather think only of increasing the natural light of reason, not in order to resolve this or that problem of the School, but in order that in every particular situation of his life his intellect may show his will what choice to make." AT x. 359–61.

(4) "Huius arboris anatomia, nobis in toto hoc opere proponitur, in qua quidem arbore, radices primum scilicet Principia, et causas corporis naturalis; corticem, accidentia corporis naturalis; truncum, mundum: et ramos, coelos nempe, elementa, mixta spectabimus...." de Raconis 1651, pars 3, p. 1. We should recall that Descartes read de Raconis' *Philosophy* in the 1640s, during the genesis of the project that became the *Principles*, when looking for a Jesuit *Summa*.

(5) Ramus 1555, 138–9.

(6) Bacon 1620, i, aph. 14; also aph. 13: "The syllogism is not applied to the first principles of sciences, and is applied in vain to intermediate axioms; being no match for the subtlety of nature. It commands assent therefore to the proposition, but does not take hold of the thing," and elsewhere. Further, see Michel de Montaigne, who reports in his *Essais* (1580) that logic has no practical use, that its inventors must have been playing a game: "What good can we suppose that knowledge of so many things was to Varro and Aristotle? Did it exempt them from human discomforts? Were they immune to the accidents that afflict a porter? Did they derive from logic some consolation for the gout? Because they knew how that humor lodges in the joints, did they feel it any less? ... Chrysippus said that what Plato and Aristotle wrote on logic must have been written as a game and for practice, and he could not believe they had said anything serious on so frivolous a subject." Montaigne 2003, 48, 70.

(7) Sanchez 1581, 7.

(8) Sanchez 1581, 11; ACS 14.

(9) Rule 2, AT x. 365. There is, of course, another argument in Rule 2, one against probable syllogisms, "those war engines of the Schools," from which Descartes claims emancipation.

(10) Rule 4, AT x. 372–3.

(11) Rule 10, AT x. 406. One can, of course, reply on behalf of Aristotle that logic was never intended to be ampliative, i.e. it was not intended to teach something new, or to be of use in investigating the truth of things. So these modern complaints against logic seem a bit misplaced. Still, seventeenth-century Scholastic logic is different than Aristotelian logic, in that it seems more psychologistic, i.e. it appears to aim at the perfectibility of human

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intellectual faculties. Thus, it may be a more legitimate target for the criticism.

(12) Rule 13, AT x. 430.

(13) Rule 14, AT x. 439-40.

(14) That Descartes' notion of deduction (*deductio*) is not logical deduction is further corroborated by the fact that he also calls it *induction* (though it may be just a misprint in the manuscript). See Rule 3, AT x. 368. Descartes' "deduction" also seems to be an ampliative procedure.

(15) As Stephen Gaukroger puts it: "Descartes' construal of inference in terms of an instantaneous grasp in accord with the natural light of reason precludes any attempt to provide a formal account of logical relations, since any such attempt would of necessity focus on inferential steps, and this is precisely what Descartes' account is designed to take us away from" (1989, 72). But Gaukroger sees a distinction between deduction (inference) and mathematical reasoning for Descartes: "Yet throughout his work Descartes thinks of true and effective reasoning in terms of mathematical reasoning and mathematical reasoning is, for him, algebraic reasoning. Algebraic reasoning is formal, indeed it is the paradigm of formal reasoning" (1989, 72). For a different view of deduction and mathematical reasoning in Descartes, in which algebraic reasoning is not formal, see Macbeth 2004.

(16) See Arnauld 1674, ch. 2 of part 4.

(17) As was the *Recherche de la Vérité*, which also deals with logic (AT x. 415–16), but which doesn't add much to the argument. A Dutch version of these two texts was published in 1684, but this fact does not appreciably change the history of their reception.

(18) Descartes had announced these themes in Principles, I, art. 10, published four years before the preface.

(19) AT vi. 17.

(20) AT vi. 17–18. In *Principles*, I, art. 10, Descartes gives as an example of a harmful result attending to the use of the logic of the Schools; *"That conceptions which are perfectly simple and clear of themselves are obscured by the definitions of the Schools.* ... philosophers err in trying to explain by definitions logically constructed, things which were perfectly simple in themselves; they thereby render them but more obscure."

(21) AT vi. 18.

(22) AT vi. 18.

(23) AT vi. 18–19.

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(24) AT ixb. 15.

(25) AT ixb. 13–14.

(26) Descartes' way of speaking—"ma logique," "la vraie logique," "as against la logique ordinaire," "la logique de l'Ecole"—has other precedents in his works, though these seem to indicate that Descartes might have had another line of thought that there was a "true logic" different from the logic of the Schools that might have been other than his method. In the *First Set of Replies* to Caterus, speaking of the idea of God Descartes said: "in this idea is contained what God is, at least insofar as he can be understood by me; and, according to the rules of the true logic, one should never ask whether something exists unless one first understands what it is" (AT vii. 107–8). Presumably Descartes had originally said "according to the rules of my logic," since, referring to this passage, Descartes asked Mersenne in a 1640 letter "to put instead according to the laws of the true logic, in the place where I put according to the laws of my logic" (AT iii. 272–3). It is difficult to make very much sense of the passages from the *Reply* to Caterus and the letter to Mersenne: why should the true logic or Descartes' method (as described in the four rules of method of *Discourse*, part II) forbid him to ask of something whether it exists without knowing what it is? And, according to Descartes, the four rules of method are sufficient to constitute his logic: "in place of the large number of precepts of which logic is composed, I believed that the following four rules would be sufficient for me, provided I made a firm and constant resolution not even once to fail to observe them" (AT vi. 18). Thus, either there is more to the "true logic" or there is some unspecified argument that the four rules of the *Discourse* require one to know what something is before asking whether it exists, or more narrowly what God is before asking whether he exists.

(27) AT v. 175; CSM iii. 350.

(28) Referring to a part of logic and not to logic as a whole.

(29) *Letter to Dinet*, AT vii. 577; CSM ii. 389–90. Note that this announcement comes in the 2nd edn of the *Meditations* (1642). For more on the genesis of the *Principles* from a commentary on Eustachius' *Summa* to a stand-alone treatise, see Ariew 2011, ch. 1.

(30) *Principles*, part I, art. 30: "*And consequently all that we perceive clearly is true, and this delivers us from the doubts put forward above*. It follows from this that the light of nature, or the faculty of knowledge God has given us, can never disclose to us any object that is not true, inasmuch as the natural light encompasses it, that is, inasmuch as it perceives it clearly and distinctly."

(31) The French version of the *Principles* is more explicit about the theme, adding several comments about it in arts. 48–50 and explicitly reminding the reader of it in art. 51. The Latin version starts with the following sentence: "With respect to these matters we consider as being things or modes of things, it is necessary that we should examine them here one by one." The French version has instead: "With respect to these matters

we consider as having some existence, it is necessary that we should examine them here one by one, in order to distinguish what is obscure from what is evident in the notion we have of each one." The article also adds that "there can be some obscurity in the explanation regarding the phrase 'having need only of itself'." The French article also adds an interesting sentence transitioning to created substances, there being some "that need only God's ordinary concourse" to exist and others that "are of such nature that they cannot exist without others"—i.e. substances and "the qualities or attributes of these substances."

(32) *Letter to Dinet*, AT vii. 577; CSM ii. 389. There is, in fact, a tension between "the current practice in the Schools" and *more geometrico*, as Descartes himself points out: "It should be noted that throughout the work [the *Meditations*] the order I follow is not the order of topics, but the order of reasons. This means that I do not attempt to say in a single place everything relevant to a given topic, because it would be impossible for me to prove it properly, since there are reasons that must be drawn in some cases from considerably more distant sources than in others; instead I reason in an orderly way *a facilioribus ad difficiliora*, making what deductions I can, now on one topic, now on another. This is the right way, in my opinion, to find and explain the truth." To Mersenne, 24 Dec. 1640, AT iii. 266–7.

(33) Cf. on this point the debates between Garber and Cohen 1982 and Curley 1986. See also Beyssade's article "L'ordre dans les *Principia*," in Beyssade 2001.

(34) AT v. 153; CSM iii. 336-7.

(35) AT vii. 128; ixa. 101.

(36) Replies II, AT vii. 155–6; ixa. 121–2.

(37) AT vii. 156. Assuming we don't make too much of the a priori and a posteriori because of the *tanquam*, we could hazard a non-technical interpretation. Descartes says that synthesis is as it were a posteriori because you produce it after the fact; that is, *after* your discovery; the proof itself is more a priori because it proceeds from definitions, etc. (a priori in the ordinary sense). Analysis is as it were a priori because you produce it first, as you discover. None of this has much to do with "effects from causes" or "causes from effects," which is then a feature of the French, Clerselier having woodenly translated a priori and a posteriori with their standard meanings.

(38) That is, *tanquam a priori* by "et fait voir comment les effets dependent des causes," and *tanquam a posteriori* by "comme en examinant les causes par leur effets," AT ixa. 121–2.

(39) AT vii. 156.

(40) E.g. Gueroult 1968, though even Gueroult calls the *Principles* a hybrid, something a bit bastard; "Les *Principes* sont quelque chose d'un peu bâtard puisque nous y trouvons l'ordre analytique et l'ordre synthétique," Gueroult et al. 1957, 137.

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(42) E.g. Buchdahl 1969, 118–41.

(43) Gaukroger 1994.

(44) AT's *index général* refers the reader to volumes vii and ix (the *Meditations*) and volume x (pp. 379–80 of the *Rules*) for analysis and synthesis. Strictly speaking, analysis and synthesis do not occur in the *Rules*. There are, of course, references in Descartes to the analysis of the ancients and to analysis in mathematical contexts. Cf. *Discourse*, AT vi. 20; for the analysis of the geometers and the analysis of the ancients, see AT vi. 17, and Rule 4 of the *Rules*, AT x. 373. Descartes himself says that he has rarely used the word. Complaining about Bourdin saying that he had not read the *Discourse*, Descartes replied that it seems unlikely, since "he has often complained about my analysis … even though I did not treat of it anywhere else, and did not even speak of the word analysis except in this *Discourse on Method* about which he said he had not read." AT vii. 569–70.

(45) *Regulae*, AT x. 418.

(46) See AT vii. 65 for the criterion of truth being used in the a priori proof.

(47) The proof of Proposition I (The existence of God is known from the mere consideration of his nature) makes reference to Descartes' answer to Objection 6 of Replies II, about the criterion of clarity and distinctness. Postulates II-VII are about selfevident propositions and clear and distinct perceptions; in particular, Postulate IV states: "I ask readers to realize that all that we perceive to be contained in them [natures that contain a combination of many accidents together] truly can be affirmed of them. For example, the equality of its three angles to two right angles is contained in the nature of a triangle, and divisibility is contained in the nature of a body, that is, of an extended thing. ... Such being the case, it is true to say of every triangle that its three angles are equal to two right angles, and that every body is divisible"; Postulate VI: "I ask the readers to get into the habit of distinguishing things that are clearly known from things that are obscure, by carefully reviewing all the examples of clear and distinct perception, and likewise of obscure and confused perception, that I have recounted in my Meditations"; Postulate VII: "finally, when readers perceive that they have never discovered any falsity in things they clearly perceived ... I ask them to consider that it is utterly irrational to call into doubt things that are clearly and distinctly perceived by the pure understanding merely on account of prejudices based on the senses or on account of hypotheses in which something unknown is contained"; AT vii. 163.

(48) This is not the place to discuss the "Cartesian circle." I cite the example of the criterion of truth seeming to precede the a priori proof in the *Meditations* and Geometrical Appendix as a problem for the *Principles* being said to follow a synthetic order (or even being said to follow a geometrical order). The possible resolutions for the problem (and other such problems) are multiple, of course. See Gueroult 1954, among others.

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(49) In this I agree in general with Gueroult (cf. n. 48) and Gouhier, who said that in *Principles*, part I, "Descartes seems to seek, in a synthesis mitigated with analysis, a kind of compromise between the practices of teaching and the needs of a proper Cartesian teaching," 1962, 109. Perhaps the position would be better put that the *Principles* is neither analytic nor synthetic.

(50) The whole theory of substance, principal attribute, modes, qualities, and attributes, displayed in arts. 51 to 56, is first set out in the *Principles* (or at least in the *Principles* and the *Replies: Principles*, part I, and Descartes' *Replies* to the *Objections* having been written at roughly the same time, during 1640–1).

(51) AT vii. 137. The French version of the text modifies "univocally" with "as they say in the Schools," AT ixb. 108.

(52) AT vii. 433.

(53) AT v. 347.

(54) See Ashworth 1991, 2009.

(55) See Boulnois 2013, chs. 3.4 and 7.

(56) That was the structure of de Ceriziers' reasoning, namely if not univocal, then analogical: "If one recalls that the word univocal expresses a nature that equally participates in the things it signifies, no one will believe that being would be univocal, although common to God and his creation. It remains, then to know whether it is analogous for God and creatures by attribution or by proportion," 1643, iii. 6–7.

(57) Spinoza 2002, Ethics, I Prop. 17, scholium.

(58) Spinoza 2002, 207.

(59) See e.g. Beyssade 1996. Marion holds the contrary: see 1981, 13–17 and 110–39, and 1996, 221–82.

(60) AT vii. 241. The full context talks about "all these modes of speaking, which are taken from the analogy of an efficient cause, are particularly necessary in order to direct the light of nature in such wise that we pay particular attention to them."

(61) AT vii. 51.

(62) AT vii. 57. Descartes continues, however, by asserting that the faculty of willing is incomparably greater in God than in him. Tad Schmaltz argues that because of the creation of the eternal truths, there is a *dis*-analogy between God's will and that of creatures, that the difference is more a difference of kind than of degree. In this he attempts to support a thesis of Jean-Luc Marion's "that Descartes' views on the eternal truths lead to 'the disappearance of analogy,' and especially to the disappearance of the

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Scholastic view that there is an analogical resemblance between God's mind and our own." Schmaltz 2001, 86.

(63) AT v. 156; CSM iii. 339–40.

(64) AT vii. 136; ix. 107. The context of the sentence occurs when Descartes denies that we can form the idea of God "de la consideration des choses corporelles." Descartes says: "*Qu'elle [l'idée de Dieu] peut être formée de la considération des choses corporelles*, cela ne me semble pas plus vraisemblable que si vous disiez que nous n'avons aucune faculté pour ouïr, mais que, par la seule vue des couleurs, nous parvenons à la connaissance des sons."

(65) For a typical discussion of Scholastic and Cartesian theory of distinctions, see Ghisalberti 1996. See also Rozemond 1998 or Schmaltz 2008. As I have shown, Suárez was not alone in holding for a third distinction between real and of reason, called formal or modal.

(66) *Principles*, I, art. 60; art. 61 for modal distinction and art. 62 for distinction of reason.

(67) Suárez 1998, disp. 7, §2, no. 2, 9, for real distinction; disp. 7, §2, no. 3, 9, for modal; and disp. 7, §2, no. 28, for distinction of reason.

(68) AT viiib. 342–3.

(69) See AT viiib. 347-52.

(70) Descartes wrote: "Creation differs from conservation only by way of reason (*adeo ut conservatione sola ratione a creatione differre*)," AT vii. 49.

(71) AT iii. 297.

(72) The earliest mention of the Letter to the Sorbonne is 11 Nov. 1640 in letters to Gibieuf (AT iii. 236) and Mersenne (AT iii. 239). The earliest mention of the Synopsis is 24 Dec. 1640 in a letter to Mersenne (AT iii. 268) where Descartes tells Mersenne that he will be sending him a synopsis in a week. (See also Descartes to Mersenne, 31 Dec. 1640, where Descartes attached the synopsis.)

(73) AT vii. 100.

(74) AT vii. 120.

(75) "For our distinguished author admits in his reply to the theologian" (AT vii. 200) and "Further he recognizes no distinction between the states of a substance and the substance itself except for a formal one" (AT vii. 218). Again, we have a situation in which Descartes seems to deny only one of the alternatives when we have three cases. Here, however, if Descartes' argument simply denies that we are dealing with a distinction of reason, it cannot conclude that the distinction is real (but real or formal/modal, etc.).

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(77) The reconsideration continues in a letter to an unknown correspondent of 1645 or 1646. There Descartes commented on both his reply to Caterus and his articles from the *Principles*. Clearly he is more comfortable with Scholastic vocabulary by then: "I say that shape and other similar modes are strictly speaking modally distinct from the substance whose modes they are; but there is a lesser distinction between the other attributes. This latter distinction can be called modal—as I did at the end of my *Replies to the First Objections*—but only in a broad sense of the term, and it is perhaps better called formal. But to avoid confusion, in article 60 of Part One of my Principles of Philosophy where I discuss it explicitly, I call it a conceptual distinction—that is, a distinction made by reason ratiocinatae. I do not recognize any distinction made by reason ratiocinantis—that is, one which has no foundation in reality—because we cannot have any thought without a foundation; and consequently in that article, I did not add the term *ratiocinatae*.... So then, I postulate three kinds of distinction: first a real distinction between two substances; and then modal and formal distinctions, which are distinctions of reason ratiocinatae. All these three can be called real in contrast to the distinction of reason ratiocinantis." (AT iv. 349-50; CSM iii. 280-1.) Notably, the 1647 French translation of the Principles does not change substantially from its 1644 Latin version and does not incorporate these developments from 1645-6.

(78) *Principles*, I, art. 58. In art. 59, he adds: "Universals arise solely from the fact that we avail ourselves of one and the same idea in order to think of all individual things that have a certain similitude. When we understand under the same name all the objects represented by this idea, that name is universal."

(79) *Principles*, II, art. 23. The title of the principle is "That all the variety in matter, or all the diversity of its forms, depends on motion."

(80) Spinoza 2002, Ethics II, Proposition 13, Lemma 1 and proof to Lemma 3. The secondary literature on these matters is extensive. For a discussion of bodies being individuated by their motion, see Garber 1992, 175–81.

(81) AT iv. 164–5.

(82) AT iv. 167.

(83) AT iv. 167–8.

(84) AT iv. 168–9. See also *To Mesland*, 1645 or 1646, AT iv. 345–8 and *To Clerselier*, 2 Mar. 1646, AT iv. 371–3.

(85) Clerselier had shown the Mesland letter to Desgabets who defended Descartes' account in an anonymous pamphlet, *Considérations sur l'état présent*, published in 1671. The pamphlet was promptly condemned by the French royal confessor Jean Ferrier as "heretical and very pernicious"; even Arnauld criticized it. Desgabets' Benedictine order prohibited him from speaking out publicly on theological matters. As a result, the

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complete Mesland letters were not actually published until the nineteenth cent. (first in Descartes 1811, and then, in a better edn, in Bouillier 1868).

(86) AT iv. 165. See also AT iv. 216.

(87) AT v. 194.

(88) *Principles*, I, art. 27; *To More*, 5 Feb. 1649, AT v. 274. I will be using "intellect" as a verb for *intelligere*, so as to leave "conceive" and "comprehend" for *concipere* (or *concevoir*) and *comprehendere* (or *comprendre*).

(89) To More, 15 Apr. 1649, AT v. 345. Cf. also *To Regius*, 24 May 1640, AT iii. 64; *To Hyperaspistes*, Aug. 1641, AT iii. 426–7; *To Clerselier*, 23 Apr. 1649, AT v. 356.

(90) See the French version of *Principles*, I, art. 27: "this arises from a defect of our understanding and not from their nature [things we call indefinite]"; *To Chanut*, 6 June 1647, AT v. 52.

(91) *Principles*, I, art 27: "We do not in the same way positively intellect that there are no limits in the infinite but merely negatively admit that their limits, if they exist, cannot be found by us"; *To More*, 15 Apr. 1649, AT v. 345.

(92) Principles, I, art. 27; To Chanut, 6 June 1647, AT v. 51.

(93) *Principles*, I, art. 26; *To Mersenne*, 15 Apr. 1630, AT i. 146, 11 Oct. 1638, AT ii. 383, 11 Nov. 1640, AT iii. 233–4, 3 Dec. 1640, AT iii. 273–4, 28 Jan. 1641, AT iii. 293–4.

(94) "Non comprehendere" or "ne pas comprendre": *To Hyperaspistes*, Aug. 1641, AT iii. 430; cf. also *To Mersenne*, 6 May 1630, AT i. 150; *To Mersenne*, 2 Jan. 1641, AT iii. 283; AT vii. 141 (AT ixa. 87–8); *Principles*, I, art. 19: "We do not comprehend the whole nature of God."

(95) "Savoir, appercevoir," or "intelligere": *To Mersenne*, 27 May 1630, AT i. 152; AT ix. 210.

(96) To Mersenne, July 1641, AT iii. 393; To Regius, 24 May 1640, AT iii. 64.

(97) "Non concipere" or "ne pas concevoir": *To Mersenne*, 27 May 1630, AT i. 152.

(98) To Mersenne, 27 May 1630, AT i. 152.

(99) To Mersenne, July 1641, AT iii. 393.

(100) AT vii. 139–40.

(101) A discussion of Descartes' *Principles*, with reference to the *World* and essays appended with the *Discourse*, would require a separate volume or volumes by itself; and, as I have said, there are already excellent discussions of Descartes' Physics (in

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Garber 1992, among others). I treat here a few topics that I think contrast well with Scholastic physics and are preliminary to my brief examination of Cartesian physics.

(102) *Principles*, IV, art. 188.

(103) AT iii. 298.

(104) AT vii. 434.

(105) AT vi. 239.

- (106) AT iii. 491–2.
- (107) AT x. 7.

(108) AT x. 26.

(109) AT viiia. 52–3.

(110) AT viiia. 103. Descartes had said the same thing to Mersenne, 9 Jan. 1639, AT ii 485.

(111) Aquinas 1918–30, iii. 22. This is an obscure passage about celestial bodies becoming more perfect by acquiring proper places by analogy to matter acquiring a proper form; there Aquinas says: "thus matter receives successively all the forms towards which it is in potential" (*sic enim successive materia omnes formas suscipit ad quas est in potentia*). See Carraud 2007.

(112) AT x. 433.

(113) *Principles,* II, art. 13. Another difference with the Scholastics concerns external place, which is defined as the surface of the containing body, but then said to be not a part of the containing body, but the "boundary between the surrounding and surrounded bodies ... the common surface, which is not part of one body more than of the other." *Principles,* II, art. 15.

(114) AT xi. 20.

(115) AT xi. 20.

(116) AT xi. 20–1.

(117) Principles, IV, art. 202.

(118) Principles, II, art. 16.

(119) The work had a 2nd edn in 1932. Burtt indicates that the 2nd edn contains no changes in his narrative before Newton: "No historical researches during the last six years with which I have become acquainted seem to require any essential changes in the survey here embodied, so far as it reaches." Burtt 1954, preface to the revised edn.

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(121) Koyré studied with Husserl at Gottingen. As Sophie Roux states: "Husserl claimed that Galileo was the first to mathematize nature, i.e., according to Husserl, to surreptitiously substitute mathematical idealities for the concrete things of the intuitively given surrounding world" (*The Crisis of European Sciences and Transcendental Phenomenology. An Introduction to Phenomenological Philosophy*, Engl. tr. David Carr (Evanston, IL, 1970), §9, 23–59), in Roux 2010, 1n. For Koyré's Bachelardian inspiration, see e.g. Iliffe 1995.

(122) Dijksterhuis 1969, 377. See also Koyré's reiteration of this view in his 1962, 11–12. The 1957 English version of that work and Koyré 1955 find their way into the bibliography of Dijksterhuis' 1969 English translation, but, obviously, not in the text itself.

(123) Koyré 1978, 3. For Koyré, the second major change was the "dissolution of the cosmos," with all that that entails. An aside: To the extent that I think that the law of inertia was first formulated by Descartes in his 1632 *Le Monde*, I do not think correct Koyré's view that the mathematization of nature made the law of inertia possible. But I will not pursue this train of thought here.

(124) Burtt 1954 [1924], 105.

(125) Burtt 1954 [1924], 106-7.

(126) Burtt 1954 [1924], 107.

(127) Burtt 1954 [1924], 108.

(128) Burtt 1954 [1924], 109.

(129) Dijksterhuis 1969, 404.

(130) Dijksterhuis 1969, 404.

(131) I will not go into any details of this answer. It should suffice to refer to Descartes on the creation of the eternal truths and the fact that, for Descartes, metaphysical truths are more certain than mathematical truths.

(132) Dijksterhuis 1969, 404.

(133) Dijksterhuis 1969, 405.

(134) Dijksterhuis 1969, 404–5.

(135) Dijksterhuis 1969, 405. Dijksterhuis is aware that the *Rules* was not published until 1701.

(136) Dijksterhuis 1969, 405.

(137) Dijksterhuis 1969, 406.

(138) Dijksterhuis 1969, 409.

(139) AT x. 394.

(140) AT x. 395.

(141) See Garber 2001, 85–110.

(142) A word about *Mathesis Universalis*: It has been pointed out (by J. -P. Weber in 1964) that Rule 4 has two dissonant parts, the second of which contains Descartes' views on *Mathesis Universalis*. While some able commentators (e.g. J. -L. Marion 1975) have argued that one can provide a reading of Rule 4 that takes both parts into account, others have argued that *Mathesis Universalis* is either a later or an earlier version of Rule 4 or even that it does not belong at all in the manuscript. I think that these issues can be settled in favor of *Mathesis Universalis* being a later interpolation and I am confirmed in this by the fact that the recently discovered Cambridge manuscript of the *Rules* is missing part 2 of Rule 4, containing *Mathesis Universalis*. See the edition of the *Rules* by Richard Serjeantson and Michael Edwards (Oxford University Press, forthcoming). Thus, for Descartes, *Mathesis Universalis* is not the "guiding principle for his whole life-work," and mathematics was not "the sole key needed to unlock the secrets of nature."

(143) AT vi. 7.

(144) AT vi. 19-22.

(145) To Mersenne, 15 Apr. 1630, AT i. 145.

(146) To Mersenne, 27 July 1638, AT ii. 268.

(147) To Mersenne, 11 Mar. 1640, AT iii. 39.

(148) AT xi. 314–15. The last few assertions differ from the first few in that they reveal something like a metaphysical thesis about the relations between mathematics and physics, as opposed to an epistemological or methodological one. There is, of course, also the notion of geometric order (*more geometrico*) in Descartes' Appendix to *Replies II*. For a development of this view in a Cartesian, see Lodewijk Meyer's Preface to Spinoza's *Descartes' Principles of Philosophy*. The issue is complex; exemplars of it span such diverse thinkers as Jean-Baptiste Morin's *Quod Deus sit* and Nicolaus Steno's *Elementorum myologiae specimen seu Musculi descriptio geometrica*.

(149) AT vii. 78; ix. 101. The French version is almost the same: "I do not accept any principles in physics that are not also accepted in mathematics, so that I may prove by demonstration everything I would deduce from them; these principles are sufficient,

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(150) *Principles*, I, art. 63.

(151) Principles, I, art. 64.

(152) Principles, I, art. 65.

(153) Let me put the same point somewhat differently: Descartes is no atomist, but supposing he was, he would refer all natural phenomena to his two fundamental principles, atoms and the void. The properties of bodies then would be "what the geometers call quantity," namely size, shape, and motion.

(154) See e.g. Blake et al. 1960; Laudan 1981; Garber 1978, 2001; Clarke 1982.

(155) Clarke 1989; McClaughlin 2000; also Ariew 2006.

(156) In French this is *hypothèses* and *suppositions* as nouns, with *supposer* as a verb; in Latin, these are *hypotheses*, *positiones*, and *ponere*.

(157) Principles, III, art. 15.

(158) Principles, III, art. 16.

(159) Principles, III, art. 17.

(160) *Principles*, III, arts. 17–18.

(161) Principles, III, art. 19.

(162) *Principles*, III, art. 19, AT ixb for the bracketed phrase.

(163) Principles, III, art. 43.

(164) Principles, III, art. 44.

(165) *Principles*, III, art. 44, AT ixb for the bracketed phrase.

(166) Principles, III, art. 45.

(167) *Principles*, III, art. 46, AT ixb for the bracketed phrase.

(168) To Mesland, May 1645, AT iv. 216–17.

(169) *Discourse*, VI, AT vi. 76: *suppositions* in the *Discourse*; *hypotheses* in the *Specimina*, p. 68.

(170) Discourse, VI, AT vi. 76.

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(171) Meteors, I, AT vi. 233: suppositions; hypotheses in the Specimina, p. 208.

(172) *Dioptrics*, I, AT vi. 83: *suppositions*; *hypotheses* in the *Specimina*, p. 73.

(173) Morin to Descartes, 22 Feb. 1638, AT i. 540.

(174) *To Vatier*, 22 Feb. 1638, AT i. 562.

(175) To Mersenne, 25 Nov. 1630, AT i. 179.

(176) Le Monde, V, AT xi. 31.

(177) *Le Monde*, VII, AT xi. 48.

(178) To Mersenne, 27 May 1638, AT ii. 141.

(179) *To Morin*, 13 July 1638, AT ii. 200.

(180) Various commentators view Descartes' development differently. After all, there are sufficient texts available to be able to argue for the hypothetical structure of Descartes' science from his earliest writings. Even in the *Discourse*, Descartes states: "First, I have tried to find in general the principles or first causes of all that is or can be in the world, without considering anything but God alone, who created the world, and without deriving these principles from any other source but from certain seeds of truths that are naturally in our souls. After that I examined what were the first and most ordinary effects that could be deduced from these causes. ... After this, passing my mind again over all the objects that have ever presented themselves to my senses, I dare say I did not notice anything in them that I could not explain easily enough by means of the principles I had found. *But I must also admit that the power of nature is so ample and so vast, and these principles are so simple and so general, that I notice hardly any particular effect without at once knowing that it can be deduced in many different ways from them," AT vi. 63–4 (emphasis mine). Cf. Garber 1978 and Gaukroger 1995.*

(181) Cf. Garber 2001b for more on this background and the relationship to the project of the *Rules* of his promise to derive the principles of physics from metaphysics.

(182) *Principles,* IV, art. 200.

(183) Principles, IV, art. 201.

- (184) *Principles*, IV, art. 202.
- (185) Principles, IV, art. 202 (AT ixb).

(186) Principles, IV, art. 203 (AT ixb).

(187) *Principles,* IV, art. 203 (AT ixb).

- (188) Principles, IV, art. 204 (AT viiia and ixb).
- (189) Principles, IV, art. 205 (AT viiia and ixb).
- (190) Principles, IV, art. 206 (AT ixb).
- (191) Principles, IV, art. 205 (AT viiia and ixb).
- (192) Principles, IV, art. 205 (AT viiia and ixb).
- (193) Principles, IV, art. 206 (AT viiia and ixb).
- (194) *Discourse*, V, AT vi. 57.
- (195) The Specimina adds, "ut loquntur Philosophi [as the philosophers say]," p. 35.
- (196) *Discourse*, IV, AT vi. 37–8.
- (197) To Mersenne, 30 Aug. 1640, AT iii. 163-4.
- (198) To Mersenne, 11 Mar. 1640, AT iii. 40.
- (199) To Mersenne, 22 July 1641, AT iii. 415–16.
- (200) To Mersenne, 21 Apr. 1641, AT iii. 359.

(201) *Sixth Replies,* AT vii. 436. French translation: "la volonté du roi peut être dite la cause efficiente de la loi, bien que la loi même ne soit pas un être naturel, mais seulement (comme ils disent en l'École) un être moral" (AT ixa. 236).

- (202) Seventh Set of Objections and Replies, AT vii. 475.
- (203) To Mersenne, 26 Apr. 1643, AT iii. 653.
- (204) To Mesland, 2 May 1644, AT iv. 111.
- (205) To Huygens, 30 Nov. 1646, AT iv. 788.
- (206) *To Christina*, 20 Nov. 1647, AT v. 83–4.

(207) *To Mesland*, 9 Feb. 1645, AT iv. 173, AT iii. 379, also gives a French version of this letter, *To Mersenne*, 27 May 1641: "*Morallement* parlant, il soit difficile que nous puissions faire le contraire, parlant neantmoins *Absolument*, nous le pouvons."

(208) Moeurs, Dictionnaire de L'Académie française (1694).

(209) Arriaga 1632, Logica, disp. 16, sect. 4: 226 col. a. (1639, 200). Cited by Curley 1993, 16–17. Compare with Etienne Chauvin's *Lexicon philosophicum*, post-dating Descartes:
"An act of the intellect is said to be morally certain when it assents to a truth that,

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although it can happen otherwise, is nevertheless so constant that doubt about it is contrary to good principles of action. ... One is said to be physically certain when one assents to an object firmly, on account of an immutable principle in nature, or ... to a truth that, although it is possible to think otherwise, is most constant, as long as the order of nature remains the same. ... One is said to be metaphysically certain when one is assenting firmly to an object which is presented to me in such a way that it cannot be otherwise even by the absolute power of God, or when I assent to a truth which cannot even by thought be otherwise," cited by Curley 1993, 16, from Gilson 1913, 334.

(210) Arriaga 1632, Logica, disp. 16, sect. 9: 238-9 (1639, 211-12).

(211) Eustachius a Sancto Paulo 1629 [1609], i, part 3, tract 3, disc. 1, q. 4, p. 152. ACS 77–8.

(212) Arriaga 1632, Logica, disp. 16, sect. 9: 239, col. a, b (1639, 211–12). Arriaga changes his illustration from knowing that Naples exists to knowing that Rome exists.

(213) "Certitudo est triplex, objecti, cognitionis, et cognoscentis," Conimbricenses 1606, 696, col. b.

(214) Suárez 1998, disp. 29, sect. 3, nos. 35–7, ii. 60.

(215) "Une morale par provision," AT vi. 22. As a number of scholars have already indicated, Descartes' *morale par provision* does not need to be thought of as provisional in a derogatory way, as if it were inadequate. See Gilby 2011.

(216) AT vi. 23.

(217) AT vi. 28.

(218) AT vi. 24.

(219) AT vi. 25.

(220) AT vi. 27. Descartes does not call the review of various occupations a fourth maxim, but argues that cultivating his reason brought him contentment and that the first three maxims were founded on the plan he had for instructing himself and thus are consistent with his present occupation.

(221) AT iv. 265.

(222) AT vi. 25.

(223) AT vi. 26.

(224) Du Vair 1619, 256.

(225) Du Vair 1619, 257-8.

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(226) Du Vair 1619, 261.

(227) Du Vair 1619, 261–2.

(228) Montaigne 1962 [1580], i, ch. 23, p. 125. See also Montaigne 2003, 73 and 131.

(229) Charron 1983 [1604], 497; see also p. 500.

(230) Charron 1983 [1604], 387.

(231) AT vi. 31.

(232) AT ixb. 3-4.

(233) AT ixb. 14.

(234) Cottingham 2008, 238.

(235) AT ix. 326.

(236) " ... je te presente ces lettres avec autant de confiance que Monsieur Descartes a pû faire lui-même ses autres écrits, sçachant qu'elles ne cedent en rien à pas un autre ouvrage que tu ayes pû voir de luy." Descartes 1657.

(237) Descartes 1657.

(238) Descartes 1685.

(239) Chapter 1 of the work is divided into three: (1) De Summo Bono (from a letter to Christina, 20 Nov. 1647, v. 82-5: Clerselier's numbering 1-henceforth just C). (2) De *Vita Beata* (from letters to Elisabeth: 4 Aug. 1645, iv. 264–6: C 4; 1 Sept. 1645, iv. 281–7: C 6; 15 Sept. 1645, iv. 291-6: C 7; Jan. 1646, iv. 354-6: C 10). (3) De Libero Arbitrio (from a letter to Mersenne: 27 May 1641, iii. 378-80: C 112; to Mesland, 2 May 1644, iv. 117: C 115; and to Elisabeth: Jan. 1646, iv. 354: C 10; 3 Nov. 1645, iv. 332: C 7). Chapter 2 contains the selections from *Passiones animae*. And chapter 3 is a treatise on intellectual love: It starts with a fragment of a letter to Chanut (1 Feb. 1647, iv. 601–6: C 35), "What is Love?" and continues with a discussion of the following topics: Whether natural light alone teaches us to love God? (To Chanut, 1 Feb. 1647, iv. 607–13: C 35); What are the causes that often incite us to love someone in preference to another before we know their worth? (To Chanut, 6 June 1647, v. 56–8: C 36); Of the two derangements, which one is worse, the one caused by love or the one caused by hate? (To Chanut, 1 Feb. 1647, iv. 613–17: C 35); The Joy of Soul (To Elisabeth, Oct. or Nov. 1646, iv. 530: C 15); Whether it is better to be cheerful and content, imagining the goods one possesses to be greater and more valuable than they are than to have more consideration and knowledge, so as to know the right value of both and thus to grow more sad? (To Elisabeth, 6 Oct. 1645, iv. 305–8: C 8).

(240) Eustachius, de Courcelles, and Descartes 1707. Eustachius' part (taken from

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(241) AT iv. 275-6.

(242) AT iv. 265. It may be important to note that the translation in CSM iii. 257 is misleading, in that it seems to reverse the relationship: "each person can make himself content ... provided he respects three conditions, which are related to the three rules of morality which I put forward in the *Discourse on the Method*."

(243) The three conditions of the Letter to Elisabeth seem unified in that in all three we are confident in our knowledge, its limits, and our ability to reason. The first proposes for us to use our minds, as well as possible, to discover what we should do in all the circumstances of life; the second to execute everything reason advises us with constancy; and the third to recognize that what is outside our reason is outside our power. The contrast with the maxims of the *Discourse* is that the latter are set in a situation in which we are reforming our knowledge and are thus indecisive in our judgments.

(244) AT iv. 265-6.



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Descartes and the First Cartesians

Roger Ariew

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Système Général de la Philosophie or the Construction of the Cartesian Textbook

Roger Ariew

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[-] Abstract and Keywords

The title of Pierre-Sylvain Régis' multi-volume work, *Cours entier de philosophie; ou, Systeme general selon les principes de M. Descartes, contenant la logique, la metaphysique, la physique, et la morale*, tells us of its ambitions. The work is intended to be systematic and complete, that is, to satisfy all four parts of the curriculum: logic, metaphysics, physics, and morals (in that order). It also purports to be based on Descartes' principles. This chapter discusses Régis' work, and similar such works (those of Jacques Du Roure and Antoine Le Grand, in particular), on various topics from the parts of the curriculum, in relation to Descartes' views and in contrast with those of the late Scholastics. It proceeds in parallel with the previous chapter on Descartes, with sections on Cartesian logic, metaphysics and natural theology, physics, and ethics—in that order.

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Keywords: Pierre-Sylvain Régis, Jacques Du Roure, Antoine Le Grand, Cartesian logic, Cartesian metaphysics and natural theology, Cartesian physics, Cartesian ethics

The title of Régis' multi-volume work, *Cours entier de philosophie; ou, Systeme general selon les principes de M. Descartes, contenant la logique, la metaphysique, la physique, et la morale*, tells us of its ambitions. The work is intended to be systematic and complete; that is, to satisfy all four parts of the curriculum—logic, metaphysics, physics, and morals (in that order). It also purports to be based on Descartes' principles. A contemporary description of the work praises it, though concentrating on a description of the novel scientific theses contained in it:

You know that I think Régis has given the public a great system of philosophy in three quarto volumes with several figures. This work contains many very important treatises, such as the one on percussion by Mariotte, chemistry by l'Emeri, medicine by Vieussens and du Verney. He even speaks of my treatise on Hygrometers, although he does not name it. There is in it a good portion of the physics of Rohault and he refutes there Malebranche, Perrault, Varignon—the first concerning ideas, the second concerning weight, and the third, who has recently been received by the Académie royale des Sciences, also concerning weight. The *Meteors* of Lamy also in part adorn this work, and the remainder is from Descartes. Régis conducted himself rather skillfully in his system, especially in his ethics.¹

We will, of course, concentrate our discussion of the work, and similar such works, on various topics from the parts of the curriculum in relation to Descartes' views and in contrast with those of the late Scholastics. We will proceed in parallel with the chapter on Descartes, with sections on Cartesian logic, metaphysics and natural theology, physics, and ethics—in that order.

4.1. Cartesian Logic

The Status of Logic among the Cartesians

We have argued that there is a progression in Descartes about logic, from some very negative early views that traditional logic takes us away from the truth to some later more **(p.158)** positive views in which criticisms of logic are limited to its last portion called dialectics. The more positive view extended to all of logic is what François Bayle² depicts in his brief chapter on logic in *The General Systeme of the Cartesian Philosophy*. There are the usual words of caution about logic in this chapter, but Bayle clearly wishes to extend what Descartes described as the salutary effect of practicing his method on all of logic, including the logic taught in the Schools:

It cannot be said, that the Precepts which are commonly taught in Schools, are to be altogether rejected or despised, since they are established upon very good Reasons; nor that a great number of Questions, which are treated therein, and which at first appear odd enough, are of no use. For although it be not valuable, to know the truths which they explain, yet the difficulty there is in examining them exerciseth the Mind, and renders it more able to penetrate and to clear up

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Difficulties which are met with in weighty matter. ... Thus *Geometricians* make themselves capable, promptly to explicate the most difficult Problemes in those matters which are of use in the life of Man, by exercising themselves in the most knotty and the most abstract Questions of Algebra, and by making Magical Squares and other things, which are of no use in themselves.³

The chapter ends with Bayle declaring that: "But, to speak precisely, no man of good sense, that acts candidly, and labours only to find out Truth, either alone or jointly with others, without any design of deceiving them, and without any ground of fearing to be deceived himself by any Sophism, needs any other Precepts of Logick, but these four ensuing." And then Bayle recites the four rules of method from the *Discourse*, with slight variations.⁴

An affirmative view of logic and syllogism is also clearly behind the observations of the Oratorian Nicolas-Joseph Poisson, in his commentary on the Discourse: Remargues sur la méthode de M. Descartes. Poisson gives lengthy explanations of the four rules of method, but all he has to say about Descartes' critique of syllogism and logic is that "Descartes admits that he received much assistance from logic, the analysis of the ancients, and algebra and at the same time he shows in what way those sciences are useful and in what way they are defective. I do not know what use he has made of the rules of logic he learned from his teachers, except perhaps that it is by their means that he has penetrated better the opinions of the Schools, whether to retain them or to undo their influence on him."⁵ And Poisson proceeds in the same way to neglect Descartes' parallel criticism of the analysis of the ancients and algebra as too abstract and useless, confused and obscure, simply (p.159) praising Descartes' own use of analysis and algebra: "As for analysis, we see a continual use of it in Descartes, not only in geometry, but also in the most common matters, where Descartes' arguments always seem to be imbued with this method, which has become natural to him. He has also used algebra frequently, and has even made it the key to his geometry."⁶

A similar positive slant is given to logic in Le Grand's Logick, part 1 of *The Institution of Philosophy*, chapter 2, "Of the true Use of Logick, shewing that Logick is useful and necessary to the Conduct of a Rational Life":

True it is, that *Logick* seems to have declined from its primitive Majesty, since it now chiefly considers *Forms*, and is in a manner wholly taken up with the Resolving of unprofitable *Questions*: Yet neither it is wholly to be undervalued upon that account, since those *Questions* exercise the Wit of Men, and are not a little conducive to the examining of the Difficulties we meet with in other Sciences. As *Geometricians*, by exercising themselves in the crabbed Questions of *Algebra*, which are altogether Abstracted, and of no use for the Conduct of Life, are nevertheless thereby disposed for the understanding of other difficult *Problems*, that are of great use in the Life of Man. In a word, which way soever we consider *Logick*, we shall find it to be of use, and in that regard not inferiour to the *Arts* or *Sciences*.⁷

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However, not all commentators were as positive about logic as Bayle, Poisson, and Le Grand. In Du Roure's *Logique*, part 1 of his *Abrégé de la vraye philosophie*, there is a discussion of "Les Deffaux du Syllogisme," situated within a generally constructive and extended account of the matter, form, and principles of the syllogism:

Regarding the defects of syllogism, I say that it is a kind of reasoning particular to some people, necessary for no one, difficult for everyone. In the end, it is encumbered by a multitude of precepts, which are ridiculous, uncertain, and perhaps false. 1. Therefore syllogism hardly serves anyone except those who make of it a kind of commerce. 2. It is enough to reason by things without needing a plurality of words to signify them ... why is it necessary to use such a mass of superfluous words and propositions of which the syllogism is composed? 3. Some claim that the syllogism is a means for knowing the truth; but we must consider that it is a means more difficult than the truth itself.⁸

Cartesian Order or Method

It is clear that the Cartesians were not themselves united in their criticisms of logic and did not all support Descartes' views about the value of logic, dialectics, and syllogism. So we may ask: what made the logic of the Cartesians a Cartesian logic? The obvious answer lies in their emphasis on method. However, what they meant by method varied widely; again they did not fully agree among themselves and did not in general support Descartes' views about method. For example, Du Roure begins the logic part of the *Abrégé* with method, by which he means primarily what he calls **(p.160)** analysis and synthesis;⁹ he continues by discussing experience, including the following statements he takes to be true: "All our knowledge comes from experience [that is, the senses]. ... And whoever makes use of reason more than experience or reflections on experiences often falls into error."¹⁰ Du Roure then deals with Reasoning, starting with the reduced case of a single complex proposition and continuing with enthymemes composed of two propositions; he produces a thorough discussion of syllogism, ending with a section on axioms. Very little or none of this is in itself particularly Cartesian.

Du Roure is an exemplar of the kinds of difficulties Cartesians would have in constructing a quadripartite system of philosophy with which to compete with the Scholastic textbooks. While the *Abrégé* integrates the contents of the quadripartite *Summa*, Du Roure's earlier *Philosophy* (from ten years before; that is, just four years after Descartes' death) is quite different than that of his *Abrégé*. Du Roure discusses separately "The Logic of the Peripatetics" and "The Logic Derived from Descartes" in the *Philosophy*.¹¹ His Peripatetic logic is fairly standard: he goes through, in part 1, universals and categories, and in part 2, method, the square of opposition, and syllogism. His Cartesian logic consists of a summary of *Discourse*, part II, including an enumeration of and commentary on Descartes' rules of method, in succeeding chapters. One can see that his view of the usefulness of those precepts is influenced by the preface to the French edition of the *Principles*; Du Roure recommends Descartes' logic so that we can conduct our reason well, not so that we can discover truths: "But because it depends considerably on usage, it is extremely advantageous to practice the rules on simple and easy questions, such as

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those of mathematics. And when we will have acquired some habit in discovering the truth, we must apply ourselves with care to Philosophy."¹² Moreover, Du Roure quotes Descartes calling the method of the *Discourse* "the rules of the true logic" and arranges his textbook according to the order that Descartes calls for in the *Principles*. So, explicitly following Descartes' tree of philosophy, Du Roure's *Philosophy*, after a General Discourse on Philosophy, begins, as I have said, with a lengthy Peripatetic Logic and a short section on Descartes' Logic; it ends with a discourse on Metaphysics and one on Natural Theology. The subsequent volumes contain Du Roure's Cartesian-style Physics, a Scholastic Ethics, and end with an Ethics "Demonstrated from First Principles." Thus, in his 1654 *Philosophy*, Du (**p.161**) Roure tries to follow an order sketched by Descartes, though he does not integrate all the materials completely.

Some ten years later, in his *Abrégé*, the integration is more complete; moreover, the order given his new logic—beginning with method and experience before going on to propositions and syllogism—clearly breaks from the customary order that the Scholastics gave to theirs in their textbooks. As I have previously indicated, Scholastics broadly followed an order of topics dictated by the various books of Aristotle's *Organon: Categories, On Interpretation, Prior Analytics, Posterior Analytics, Topics,* and *Sophistical Refutations.* And, as I have argued, many seventeenth-century Scholastics rethought these materials into a new schema about the operations of the mind. For example, Eustachius rearranged his topics into a tripartite schema, with the first part, simple apprehension, corresponding to the materials treated by the *Categories,* and the second, on judgment, being the matter treated by *On Interpretation,* while the third, on argument, was constituted by the materials of the *Prior* and *Posterior Analytics, Topics,* and *Sophistical Refutations.*

On the Cartesian side, Clauberg's *Logica contracta*¹³ keeps to a similar traditional pattern, starting with the categories and continuing with attribute and accident, cause and effect, subject and adjunct, relation, whole and part, the same and other, universal and singular, definition, and division. Clauberg's second part of logic begins with the grades of judgment—qualitative statement; truth and falsity; opposition, conversion, and equivalence; and composite statement—and continues with argument and syllogism, both perfect and imperfect, and true and false. His third part of logic deals with the grades of memory and his fourth part concerns teaching and dialectics, order and fallacy. Again, very little of this seems Cartesian,¹⁴ though this time because it looks so traditional.

In contrast, Clauberg's *Logica vetus et nova* begins with a prolegomena arguing, along Descartes' line from the end of *Principles of Philosophy*, part I, that the principal origin of error is to be found in the prejudices of childhood. Logic is the corrective for these mental imperfections; in the first book of his logic, Clauberg devises a scheme that involves Descartes' rules of method and traditional logic, following the pattern of his *logica contracta*, as three "grades" or levels of logic. The first level has to do with accepting clear and distinct perceptions; it includes the rule of evidence¹⁵ and ends up with the rule about the division of difficulties,¹⁶ but it also discusses traditional topics such as: substance, attribute, and mode; essence and existence; universal and singular;

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definition; and division. The second level concerns right judgment and involves the rule about the order of inquiry,¹⁷ ending with the rule of the completeness **(p.162)** of enumerations;¹⁸ it also discusses induction and syllogism. Clauberg's third level concerns memory. Thus Descartes' subtle shift in position, especially his final stance in the *Conversation with Burman* with which Clauberg was familiar, allowed Clauberg to reinterpret Descartes' rules of method as part of logic, now integrated into a legitimate branch of learning that even includes syllogisms.¹⁹

Clauberg interspersed Cartesian logic into the traditional framework and Du Roure inverted the Scholastic order, discussing method and experience before demonstration and syllogism; other Cartesians found it more expedient and perhaps more intellectually satisfying, however, to follow more strictly the Scholastic order in logic, grafting on Descartes' logic in a section about method at the end of their treatises. The Port-Royal Logic, which dominated in the second half of the seventeenth century (thus also Régis' *Logique*),²⁰ and Le Grand's *Logick* are divided into four parts, constituted by the "four principal operations of the mind":²¹ (1) Perceiving, involving ideas²² (and including Aristotle's categories, universals, and names). (2) Judging encompassing propositions (or judgments), truth and falsehood. (3) Reasoning (or discourse), including syllogisms, topics, and sophisms. And (4) Ordering, resulting in method. By (p.163) method, however, these writers generally signify analysis and synthesis—which again does not have to be anything particularly Cartesian—though we do find Descartes' logic—that is, his rules of method—enumerated in the chapters on analysis. The Port-Royal Logic lists Descartes' four rules, saying that they are "general to all sorts of methods and not particular to the method of analysis alone,"²³ but then moves on to give five rules of composition, focusing on these and enlarging them in chapter 10 to eight principal ones: "The method of the sciences reduced to eight principal rules."²⁴ Régis follows suit, of course. He also lists the four rules, but he adds a faint echo of the critique of syllogism: "These four precepts can easily supplement what is missing from Aristotle's logic; we can even guarantee that they are more useful, because they can serve to discover the truth, something that those of the Philosophers cannot contribute to."²⁵ Régis also adds a chapter on "the advantages we draw from observing the four precepts of analysis"²⁶ and abbreviates the lengthy *Port-Royal* discussion of synthesis into a single small chapter and just three brief rules: leave no term ambiguous; use clear and evident principles; and demonstrate all propositions.²⁷

Le Grand does not formally list Descartes' four rules of method, though his logic seems to be the most Cartesian of the lot. As I have just stated, his justification, shared by Arnauld and Régis, for dividing *Logick* into four parts is that there are four operations of the mind, represented by ideas, by which we perceive, propositions, by which we judge, syllogisms, by which we reason or discourse, and method, by which we order. Given this organization, part 1 of Le Grand's *Logick* discusses the clear and distinct perception of the mind, beginning with a chapter on the hindrances to science and how they are to be removed, basically recapitulating Descartes' discussion of the prejudices of childhood from the end of the *Sixth Replies* and the beginning of the *Principles*. Le Grand then sets out, in the remainder of part 1, ten rules for the attainment of truth, including: "1. We are

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to admit of nothing that involves any thing of Doubtfulness";²⁸ "2. We are not to rely too much on our Senses";²⁹ "3. Whatsoever we perceive, we perceive with our Minds";³⁰ and "4. That is True which we know clearly and distinctly."³¹ The rules are interspersed within a Cartesian-style discussion of the modes of perception; that is, pure intellection, imagination, and sense, and a somewhat less Cartesian account of the five universals, or predicables. Chapters on substance and its modes follow, including "How the Name of Substance agrees to God and the Creatures." (**p.164**) ³² Thus, Le Grand mixes in materials discussed by Descartes in part I of the *Principles*, that is as metaphysical topics, in his first part of the Logick.

Part 2 of Le Grand's *Logick* is about judgment, truth, and falsity, together with seven rules for judgment. Part 3 is about syllogism; it contains rules for simple and complex syllogisms and examples of imperfect arguments, topical and sophistical syllogisms. Finally, part 4, "Concerning Method, or the Orderly Disposition of Thoughts," deals with the analytic and synthetic methods, resolution and composition. As I have said, Le Grand does not formally set out Descartes' rules of method in the chapters on analysis. But as part of the analytic method, he asserts that since this method is the art that guides reason in the search for truth, we must determine the nature of the question we wish to examine. He adds, in a Cartesian fashion, that what we are to determine are questions because we cannot proceed to something unknown except by means of something known, and questions are propositions that include something known and something unknown.³³ He then specifies that whenever the nature or cause of anything is proposed, we must:

in the first place accurately examine all the Conditions of the question propounded, without minding things as are Extraneous, and do not belong to the Question. Secondly, We are to separate those things which are certain and manifest from those that include any thing of Confusion or Doubt. ... Thirdly, Every Difficulty we meet with is to be divided into Parts. ... Fourthly, We are orderly to dispose of our Perceptions, and the Judgments we frame thence; so that beginning from the most easie, we may proceed by degrees to those that are more difficult. ... Fifthly, That the Thing in question, be furnished with some Note or other that may determine it, and make us judge it to be the same, whenever we meet with it.³⁴

This seems to be Le Grand's version of Descartes' four rules of method, restricted to what is useful to analysis. He ends his *Logick* with chapters on composition, giving various rules of definition, axiom, and demonstration similar to the ones given by the *Port-Royal Logic*.

It would appear that the Cartesians' greatest innovation was the new form they gave to their logic. But in 1648, some decades before the Cartesians wrote their logic texts, Louis de Lesclache published a Scholastic textbook, *La philosophie divisée en cinq parties*; its first part was a Scholastic logic, itself arranged into four parts, the first three concerning "the three actions of the understanding," namely "conception, judgment, and consequence," and the fourth concerning "method"; that is, resolution and

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composition.³⁵ Lesclache even decided that the usual questions about whether logic is a **(p.165)** science or an art belonged to the second part of philosophy; that is science, and not in the first part, logic.³⁶ Lesclache saw himself as a teacher and defender of the Scholastic viewpoint. In fact, his logic was even attacked in an anonymous treatise, Lesclache's critic claiming that there was nothing original in his logic: "Truly, to satisfy his desire completely, if I did not find the origin of his tables in Abraham de Guise, Kekkermann, Eustachius a Sancto Paulo, Hallier, Hoeckelshoven, Timpler, Zuingger, and Crassot, I would have admitted that he is their author."³⁷ Obviously the contents, if not the form, of Lesclache's logic were considered traditional.

So ultimately, in the second half of the seventeenth century, we have many Cartesians toning down Descartes' negative remarks about logic in order to write Cartesian logics that blend with the logic of the Schools, in which Descartes' method is simply appended to the last part of the traditional logic and is considered at best only a portion of the section on analysis (that is, Le Grand's Descartes). This Descartes does not need to be regarded as a philosopher of Bacon's ilk; that is, someone who proposes his method instead of formal logic (the real Descartes according to contemporary interpreters), nor even someone who proposes his method as the principal rules of logic (Clauberg's Descartes). At the same time we have a Scholastic logician rearranging the order of logic, dropping the traditional preliminary questions about the status of logic, and adding a new final section on method—that is, analysis and synthesis—resulting in a new quadripartite logic based on conception, judgment, consequence, and method. The convergence between the ultimate Cartesian logic and the changing Scholastic logic is striking.

4.2. Cartesian Metaphysics and Natural Theology

I begin the discussion of Cartesian metaphysics by outlining the structure of the metaphysics and natural theology of the main Cartesians (mostly Du Roure, Le Grand, and Régis), paying special attention to their notions of order. Spinoza has some well-established opinions about order and Descartes' metaphysics, so I discuss these in a preliminary way. I then turn to the views of Du Roure, Le Grand, and Régis (referring to others as needed) on the metaphysical issues discussed in corresponding sections from the chapter on Descartes' metaphysics, namely (1) analogical predication, (2) theory of distinctions, and (3) principle of individuation, ending with (4) the concept of God and the a priori proof.

As is well known, Spinoza's first publication was a refashioning of Descartes' *Principles*, titled: *Parts I and II of René Descartes' The Principles of Philosophy demonstrated in the geometric manner by Benedict de Spinoza of Amsterdam. To which are added his Metaphysical Thoughts* (1663). In this work, Spinoza recasts Descartes' **(p.166)** *Principles* in the mode of Descartes' Geometrical Appendix from *Replies II*, with propositions—that is, theorems whose proof are based on definitions and axioms—instead of questions in short articles. After a prolegomenon, Spinoza paraphrases Descartes' ten definitions from the Geometrical Appendix, omits completely Descartes' postulates,³⁸ and adds a few extra axioms, said to be taken from Descartes' writings (more or less in sympathy with Descartes' thought, as Spinoza understands it). His first four propositions

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concern doubt and the *cogito*, topics that are not treated as theorems in the Geometrical Appendix. Spinoza then follows with the propositions of the Geometrical Appendix, about the existence of God and the real distinction between mind and body, now numbered five through eight. He continues with another thirteen propositions, mostly about God's attributes, but also including such propositions as (14) Whatever we clearly and distinctly perceive is true, and (15) Error is not something positive, presumably representing Principles, I, articles 30 and 31. The other new propositions, however, do not correspond very well with Descartes' principles, though they generally look Cartesian. There are, of course, many questions that could be asked about how well Spinoza represents Descartes' intentions in the work (and whether representing Descartes faithfully was Spinoza's intention in the first place). There is certainly a substantial literature on Spinoza's conception of the geometrical manner and how it relates to Descartes' conception of order. But it is not clear that Descartes' order in the Principles and in the Geometric Appendix are the same. Unlike his procedure in the Principles, Descartes does not begin his Geometrical Appendix with propositions about doubt and the *cogito*, as does Spinoza in his version of the *Principles*; Descartes' first proposition is the a priori proof of God's existence; it is not obvious where a proposition representing the *cogito* would have been included in any extension of the Geometrical Appendix.

As he indicates in his lengthy title, Spinoza also appends another short work to his version of the *Principles*, something he announces as *Metaphysical Thoughts*. That essay is not claimed to be in the geometrical manner; indeed, it does not start off with definitions and axioms and is not constituted by propositions or theorems, but by short chapters. In fact, it looks just like a seventeenth-century Scholastic treatise on metaphysics, though with Cartesian content (there are numerous references to both Spinoza's version of Descartes' Principles and to Descartes' Principles throughout the work). Like other seventeenth-century Scholastic treatises, Spinoza's text is divided into two parts; in fact, he says, in Scholastic fashion, that he deals in the first part with "questions that commonly arise in the general part of metaphysics," and in the second part, "topics that commonly occur in the special part of metaphysics."³⁹ Moreover, in part 1 of the work, Spinoza begins with being (and not with substance). His first (p.167) chapter is about real beings, fictitious beings, and beings of reason; in the chapter, he denies the reality of beings of reason: they are not properly a topic for metaphysics. Spinoza then proceeds to questions about essence and existence. After chapters on the necessary, impossible, possible, and contingent, he discusses duration and time, order, and the transcendental predicates: the one, the true, and the good. These are materials that would usually be discussed by Scholastics—such as Goudin, or even a writer such as Clauberg, in his pre-Cartesian first edition of the Ontosophia—in their general or universal metaphysics. Goudin similarly starts with being in general and discusses essence and existence. He continues with the properties of being, namely unity, truth, and goodness. Clauberg also starts with the various senses of being, including being outside the intellect, or substance, as opposed to accident and mode. He goes on to talk about essence, existence, and duration. His remaining chapters concern concepts such as one and many, true and false, good and evil.

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In part 2 of his work Spinoza discusses God's attributes—his eternity, his unity, immensity, immutability, simplicity, life, intellect, will, power, creation, and concurrence—before ending with a chapter on the human mind; here "attribute" is given its Cartesian and Scholastic, not Spinozist meaning (as are other terms, such as "extended substance" and "thinking substance"). The close relationship between Spinoza's topics in part 2 of his *Metaphysical Thoughts* and seventeenth-century treatments of God's attributes was pointed out over a century ago. As Charles Appuhn, following Jacob Freudenthal, notes: Suárez, Cornelius Martini, Franco Burgersdijk, and Adriaan Heereboord all discuss God's attributes in part 2 of their metaphysics in roughly the same order as Spinoza (Suárez in his disputation 30).⁴⁰ In fact, Heereboord looks like the target of a number of Spinoza's understanding that in such a work one discusses successively God, angels, and the human soul. Spinoza, knowing that he should discuss angels between God and human souls, inserts a justification for not doing so:

Angels are a subject for theology, not metaphysics. ... Because Angels are not known by the natural light, they are not the concern of metaphysics. For their essence and existence are known only through revelation, and so pertain solely to theology; and because theological knowledge is completely other than, or entirely different in kind from, natural knowledge, it should in no way be confused with it. So let nobody expect us to say anything about angels.⁴¹

And although Spinoza's last chapter is titled *De Mente Humana* (Of the Human Mind), his terminology immediately switches to the status of the human soul; the third paragraph is entitled *Quo sensu anima humana sit mortalis* (in what sense the human soul is mortal). Spinoza's discussion is not just about the human mind and its faculties, but also about the mortality or immortality of the soul.

(p.168) Spinoza's Scholastic-style Cartesian metaphysics was not the first work of that kind. It was preceded by almost a decade by the Metaphysics (First Philosophy or General Science) and Natural Theology contained in Du Roure's *Philosophy*. In fact, there is a fairly similar pattern of Scholastic-style Cartesian metaphysics in the Cartesian textbook authors, from Du Roure, to Le Grand, and to Régis—Le Grand with his Natural Theology and Daemonology, plus parts of his Logic, from *The Institution of Philosophy*, and Régis with his Metaphysics, from the *General System* (although the differences between these textbooks are large, both in style and substance).

Du Roure's treatise on Metaphysics is divided into two parts, the first concerning spiritual and corporeal things taken absolutely and the second insofar as they relate to their effects (that is, as matter, form, and efficient and final causes); the first part is further divided into two chapters: about the opinions one should have concerning all things one conceives as true or as positive and about the Scholastic doctrines concerning the same topics. The first chapter is basically a paraphrase of *Principles* part I, articles 47–68 (minus articles 49–50 on the eternal truths). Du Roure talks about the truths to which we attribute no existence outside our thought, such as axioms or common notions, and such as things and their properties, which are principally divided between thinking

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things and extended things.⁴² He continues by defining substance as a being *per se*; that is, independent of any other being, or that subsists by itself, indicating that substance conceived in that way is suitable only for God. He does not tell us whether substance can be applied to creatures by analogy (or univocally or equivocally), but simply says that because substance is properly suitable only for God, "in order to extend substance to creatures one can say that substance, whether spiritual or not, does not depend on any created thing."⁴³ He then considers successively: attributes, accidents, and modes; duration, order, and number; the three kinds of distinctions, that is real, modal, and of reason; and ends with a brief discussion of thought and extension as the nature of mind and body and as modes of substance.⁴⁴

In his second chapter, Du Roure attacks Scholastic metaphysics. He argues that defining being leads to an infinite regress, and denies the real distinction between essence and existence (in particular, he denies that essence is eternal: "man is a substance" was not always true).⁴⁵ More importantly, he rejects the law of non-contradiction—"it is impossible for something to be and not to be at the same time"—as the first principle of knowledge. He argues that it cannot be a first principle since "we say that something is impossible because our thought finds some repugnancy and contradiction in conceiving it."⁴⁶ Thus our thought and existence has to be a prior principle of knowledge. As a result, Du Roure affirms the *cogito* as a first principle of knowledge, adding that the alleged Scholastic first principle is a truth that does not allow us to discover anything (p.169) else. He corroborates this by considering its conditional nature, paraphrasing the principle as "if something is, it cannot not be while it is, and if something is not, it cannot be at the same time."⁴⁷ The argument that Du Roure presents about the first principle of knowledge makes it clear that in 1654 he knew Descartes' letter to Clerselier of June or July 1646 before it was published in Clerselier's edition of Descartes' correspondence in 1657. In the letter, Descartes distinguishes two senses of principle, the chief one being that it allows us to know other things. Descartes dismisses the proposed Scholastic principles as primary: they do not make known the existence of anything, but only confirm the truth once the thing is known, something of little importance, superfluous, and useless, according to him.⁴⁸ Du Roure repeats this analysis in all his works, both in his metaphysics and in his physics: "principles must admit of two conditions. First, they must be so clear that we cannot doubt their truth when we consider them with attention. Second, the knowledge of these principles must not depend on other things, but the knowledge of other things must depend on these principles,"⁴⁹ echoing ten years later in his Abrégé de la vraye philosophie that "Principle of knowledge in the sciences must satisfy two conditions. 1. It must be evident or manifest ... 2. It must render other things evident or manifest."⁵⁰

In his Natural Theology Du Roure follows the pattern of the Scholastic discussions of particular metaphysics: he discusses the nature, existence, and attributes of God in his part 1, and then deals with angels and the rational soul (its mortality or immortality and its faculties, understanding, and will) in Part 2. He multiplies the arguments for the existence of God, giving many "derived from physics, or mores, or history," including versions of Aquinas' Five Ways,⁵¹ although he admits that a number of these do not have **(p.170)**

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the force of Descartes' demonstrations. His representation of Descartes' three arguments is very brief. Here is his version of the first or a priori argument: "we can in truth attribute to each thing what is contained in its idea and in its nature. We can therefore attribute existence to God. For existence is not any less necessarily contained in the notion we have of God than are three angles in the definition of a triangular figure."⁵² As for the divine attributes, Du Roure discusses them in two classes, those suitable to God's nature considered absolutely, and those considered relatively, with respect to creatures. He counts, among the former, God's perfection, uniqueness, intellect, eternity, immensity, simplicity, and immutability; among the latter, he discusses God's conservation, concurrence, and providence. His brief chapter on angels is a forerunner of Spinoza's. Having defined angels as intelligent creatures lacking bodies, Du Roure admits that he cannot demonstrate their existence, but that the Sacred Scriptures render this indubitable and natural reason makes it very probable. As for the attributes of angels, he says that we cannot know them either by experience or by any reasoning: "That is why theologians explain them only by the Sacred Scriptures and philosophers by analogy to separate intelligences from humans and other created beings. But these comparisons are ordinarily uncertain or useless."⁵³

Le Grand first published the Institution of Philosophy in 1671 as Philosophia Veterum, e Mente Renati Descartes. More Scholastico breviter Digesta. It was, as the title indicates, a summary of Descartes' philosophy in a Scholastic presentation. The text was composed of a section on Logic, five sections on Physics (Natural Physics, the Heavens, the Four Bodies, Man, and Mind), and a seventh about the Highest Deity (De Summo Numine). The 1672 second edition more than doubled its size and the 1675 third edition was further enlarged; they gained a new title, Institutio philosophia, secundum principia Renati Descartes, nova methodo adornata et explicata ad usum juventutis academicae (also explicitly referring to Descartes and teaching), as well as a few more parts. The section on the Highest Deity was renamed Natural Theology and moved from the end of the book to just after the section on Logic, and (in the third edition) a new section on Daemonology (about created spiritual creatures, such as intelligences, demons, and angels) was added and placed after the Natural Theology; these two sections together (often with a discussion of the separated soul) were usually called particular metaphysics; their new location between Logic and Physics does look more Cartesian. A new section on living creatures, that is plants and animals, was added (in the third edition) among those on Physics, and another new section on Ethics (De Vita Beata) was placed last-this also agrees with Descartes' order in his "Tree of Philosophy," from the preface of the French edition to the *Principles*. While subsequent editions added some new materials, ⁵⁴ this was the arrangement followed from then on.

(p.171) Le Grand clearly understood his Scholastico-Cartesian audience. As I have said, from the third edition on, he discussed particular metaphysics (that is, natural theology and daemonology) in its Cartesian position, after logic and before the various parts of physics. But one might ask where he located his general metaphysics. For that one has to consult Le Grand's First Part of Logick: Of the Clear and Distinct Perceptions of the Mind. There, one can find Le Grand's version of *Principles* part I, starting with the first chapter,

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"What the Hindrances of Science are, and how [they are] to be removed," in which he repeats Descartes' materials about the prejudices of infancy and childhood from the end of *Principles* part I. Le Grand follows this with some Rules for the Attainment of Truth, in the second chapter: (1) We are to admit of nothing that involves any kind of doubtfulness (a rule Le Grand rightly says was approved by Aristotle, in *Metaphysics* 3.1); (2) We are not to rely too much on our Senses; (3) Whatsoever we Perceive, we Perceive with our Minds; and (4) That is True which we know clearly and distinctly.⁵⁵ For Le Grand, his fourth rule of truth directly yields Descartes' a priori proof for the existence of God.⁵⁶ It is unclear whether any notion of order is operating in the treatise, since a discussion of the *cogito* follows in the next chapter, about the various modes of perception; that is, pure intellection, imagination, and sense. There, Le Grand affirms the *cogito* as a first principle of knowledge:

I have said, that this Proposition, *I Think therefore I am*, is the first Truth we meet with in our orderly Philosophizing; because the Existence of our own *Soul*, which we gather from our Cogitation, is more known to us than the Existence of any other Beings. ... and therefore this Proposition may well be esteem'd by us as a first Principle, since from the proof of our own Existence, we confirm the Existence of *God*, of *Material things*, and in a word, of all *Creatures* whatsoever.⁵⁷

Le Grand is aware that the law of non-contradiction is commonly taken to be the first principle of knowledge. He objects to it as a first principle, as would any good Cartesian: "But I see not how this Proposition can be of any use to us, in order to the attaining of Knowledge, since it doth not prove the Existence of any thing, and does seem to suppose that something is, which ought to have been proved before."⁵⁸

Le Grand's remaining chapters cover articles 48–70 from Principles part I, but not in the order Descartes gave them.⁵⁹ Three more parts of logic follow in his exposition;⁶⁰ (p.172) and then we come to his natural theology and daemonology—the former concerning God, his existence, and his attributes. In the Introductory Discourse, he argues that Theology is divided into Natural and Supernatural, that Supernatural Theology derives from the sacred scriptures with the assistance of supernatural light, but that Natural Theology demonstrates the existence and attributes of God "from the *Book* of *Nature*, and from *Principles*, derived from the *Light* of *Nature*."⁶¹ In addition, Natural Theology has to precede the other sciences, since science cannot be had without first causes and thus cannot be attained without our knowing them. Le Grand deals with the objection that knowledge of the first cause is not necessary in science, given that an atheist mathematician has such knowledge (an issue tackled by Descartes in *Replies II*). According to Le Grand, it might be said that atheists, who deny the existence of God, do clearly understand general axioms and can therefore demonstrate such propositions as the internal angles of a triangle being equal to two right angles. Thus it is possible to have knowledge without supposing the existence of God. He replies:

I Answer, That it cannot be denied, but that *Atheists* have a clear knowledge of *Geometrical Demonstrations*, and that they are so evident, as to force their assent. But yet this knowledge of theirs cannot be said to be true *Science*, founded upon

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PRINTED FROM OXFORD SCHOLARSHIP ONLINE (www.oxfordscholarship.com). (c) Copyright Oxford University Press, 2015. All Rights Reserved. Under the terms of the licence agreement, an individual user may print out a PDF of a single chapter of a monograph in OSO for personal use (for details see <u>http://www.oxfordscholarship.com/page/privacy-policy</u>). Subscriber: University of Arizona Library; date: 12 September 2015 certain *Principles*. Because no knowledge deserves the name of *Science*, that can in the least be called in doubt, and whose certainty doth not depend on an evident *Principle*. Now forasmuch as these Men are supposed to be *Atheists*, neither can they be certain that they are not mistaken in those very things, which they think themselves to have most clearly apprehended.⁶²

Since no solid knowledge of anything at all can be had without the existence of the first cause, Le Grand proceeds to prove the existence of God. But first he discusses the nature of God before examining how his existence may be known by us. This is in keeping with Descartes' statement in *Replies I* that "according to the laws of true logic, we must never ask whether something exists unless one first understands what it is."⁶³ The chapter contains some interesting paragraphs, including one on the equivocity of the word cogitation when it is attributed to God and creatures,⁶⁴ and the view of God as a positive cause of himself. Le Grand resolves the latter issue by asserting that God is a positive cause of himself, but not that he is a positive *efficient* cause of himself: "God may be said, in some manner to be Cause of himself, as long as by the word *Cause* we do not understand the *Efficient*, but only the *Formal Cause*."⁶⁵ One of the paragraphs seems to be directed against Spinoza. Le Grand denies the argument that if God is (**p.173**) an infinite being, he would contain all sorts of perfections to the highest degree and would necessarily exclude every finite being, so that nothing would exist besides him. He answers that:

the Falsity of this *Reasoning* is apparent; for we cannot conclude, that, because a Man hath more excellent Wit than others, that therefore others have no Wit at all. Or supposing his Wit to increase to *Infinity*, would this diminish the less portion of Wit possest by others? Thus, tho' *God* be consummate in all manners of Perfections, yet doth not he therefore exclude all other *Beings*; except we should conceive *God* to be *Corporeal* and *Material*; for indeed were he *Corporeally Infinite*, he must exclude all other *Bodies*. But, if we should to conceive *God* to be *Corporeal* and *Infinite*, that is comprehending all manners of *Perfections*, because then he would be Divisible, and lose his highest Simplicity and Unity.⁶⁶

Having examined what God is, Le Grand continues with chapters about whether God is, incorporating Descartes' a priori argument, his a posteriori arguments, and some non-Cartesian cosmological or design arguments "from the fabric of the world." The subsequent chapters of the Natural Theology consist of discussions of fate and will (divine decree versus human freedom) and of God's creation of the eternal truths, then of God's attributes.

Like Spinoza and Du Roure before him, Le Grand thinks that angels and demons belong as a topic to "Divines" and that they may not be an appropriate topic for metaphysics. Still, he wishes to see how much of their essence, existence, and operations can be discovered by the natural light. He decides that they are immaterial substances or spirits, but the most he can say about their existence is that, given their effects, they may exist. The rest of the treatise is similarly couched in probabilistic language and deals with

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the faculties of angels, their will, power, number and distinctions, tackling such questions as to whether they are in place, whether, lacking bodies, they have speech, and whether they can assume their own or other bodies. 67

Before turning to some Cartesian "simple notions" (analogical predication, theories of distinctions, principle of individuation, and concept of God), I should briefly sketch the structure of Régis' Metaphysics. On the whole, the work is a loose paraphrase of Descartes' Principles part I, with two extra major sections, on the understanding and on the will, finishing with a small section on the immortality of the soul. In the penultimate chapter of part 1 of his treatise,⁶⁸ Régis has some reflections on the order he follows in the discovery of natural truths in his first book of the Metaphysics, and (p.174) their different degrees of certainty. He indicates that he starts with our existence: "we have first examined whether we existed and having recognized by experience that we believe we know several things, we have concluded from that that we existed."⁶⁹ Régis then handles a standard criticism that "I think, therefore I am" supposes a great number of truths, such as "everything that thinks exists," but argues that the mind knows the particular truth before the general truth, since general truths are known only through particular truths.⁷⁰ Having established his own existence and that his nature was to think, Régis then claims that he found in himself several ways of thinking, some representing things outside of him, that is ideas, and some representing things inside him, that is sensations. He then asserts that he examined next

whether, from the fact that I had ideas, it followed that there was something outside of me that existed, and recognized in the end that my ideas were of such nature that they depended absolutely on an exemplary cause for having the property of representing certain things rather than others—from which I concluded that these exemplary causes existed; thus the substance that thinks perfectly and extended substance are the exemplary causes of the ideas of God and of Body.⁷¹

In fact, Régis proves the existence of bodies in chapter 3 before he proves the existence of God in chapter 5. He continues with the a posteriori proof for the existence of God and then gives a proof of the existence of particular bodies and the sensible world, including his own body and its union with his mind.

This summary of the order followed by Régis clearly points to the great differences between him and Descartes, from the almost complete disappearance of doubt, to the quasi-realist view of ideas⁷² and, thus, to the proof of the existence of bodies before that of the existence of God. These features of Régis' system indicate his indebtedness to Robert Desgabets' influence. We can enumerate the following three important theses among Régis' and Desgabets' unorthodox or "Radical Cartesian" views: (1) the "indefectibility" or indestructibility of matter, (2) realism about the representative contents of ideas, and (3) a tight union of mind and body such that even pure thoughts require bodily processes.⁷³ The first two theses are evident in Régis' chapter 12, on God as the **(p.175)** author of the existence of the nature of mind and body. There Régis

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argues that God conserves both body and mind by the same action he has created them and that "the mind and the body are two indefectible substances ... asking whether body and mind are defectible is the same thing as asking whether God's will, which is immutable, can change."⁷⁴ The reason for Régis' claim of immutability in God's will with respect to bodies becomes clearer in Régis' subsequent chapter, on the nature and possibility of the existence and possibility or impossibility of modal beings, in which he argues that God can change the nature of things, but that by "Nature" he does not understand their essence, but only their ordinary state.

One can see that Régis (and Desgabets before him) have a different account than Descartes about the consequences of the creation of the eternal truths. Tad Schmaltz argues that Desgabets and Régis were led to their views by an attempt to maintain and to fix a serious defect in that central Cartesian doctrine. Descartes' doctrine of the creation of the eternal truths was rejected for different reasons by diverse thinkers such as Spinoza, Leibniz, and Malebranche. Given the doctrine, Leibniz even thought that Descartes was deceiving people when he claimed to be proving the existence of God: "Descartes' God, or perfect being, is not a God like the one we imagine or hope for, that is, a God just and wise, doing everything possible for the good of creatures.... Descartes' God has neither will nor understanding, since according to Descartes he does not have the *good* as object of the will, nor the *true* as object of the understanding."⁷⁵ The doctrine also came under severe internal criticism in Simon Foucher's Critique de la *recherche de la vérité*; Foucher⁷⁶ objected to Malebranche's (**p.176**) assertion that necessary truths "have been fixed by the will of God which is not subject to change";⁷⁷ he could just as easily have been objecting to Descartes' statements on the creation of the eternal truths. According to Foucher,

If what God wills is immutable because his will is not subject to change, it follows that all he wills should have an equal immutability, since the same will is the cause. However, it is certain that God wills things that are subject to change when he causes creatures to exist or to cease to exist in the vicissitudes of time. Thus if God should decree some truths only for some centuries, his will would be no less immutable—no less than when it produces every day the admirable changes that constitute the beauty of the universe.⁷⁸

Foucher adds, "But the author will say, God wills that these truths be immutable forever. How could the author know this unless he has some special revelation?"⁷⁹

So Desgabets and, later on, Régis responded by distinguishing clearly between what God created that cannot change and what he created that can. It is not that necessary truths are fixed by the will of God, which is not subject to change, but that necessary truths are created by the will of God with natures that, from the depth of their being, are atemporal and thus immutable. As a result, Desgabets and Régis' answer to Foucher is that there are substances that are unchangeable by nature and modes that are changeable: "modes alone and not substances coexist in time." As Schmaltz points out, in one way or another, this is the basis for the three ostensibly non-Cartesian theses. The indefectibility of matter follows in that "matter considered according to what is suitable absolutely and essentially

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is not in any present, past, or future time. ... Time or duration is really the same thing as motion and matter is in itself indifferent to motion or to rest, such that there could have been matter in the world without there having been any time, since there might not have been any motion."⁸⁰ Thus the essence of matter is indestructible and thus also substances are simple and indivisible and do not need any conservation distinguished from their creation. The doctrine of the creation of the eternal truths properly interpreted requires one to separate substantial being carefully from modal being; it is substance, not just mental substance, which is indefectible. By another path, Desgabets and Régis achieved a quasi-Spinozistic view of temporal beings as changeable modes of unchangeable substance. However, Régis, who wrote after the publication of Spinoza's posthumous works, tried very hard to distance himself from Spinoza's views, and hence produced slightly different doctrines than Desgabets, who was writing before the publication of the *Ethics*.

Although their aims appear to be similar; that is, to produce a conventional-looking metaphysics from Cartesian elements, there are few common structural elements in the metaphysics of (early) Spinoza, Du Roure, Le Grand, and Régis. But perhaps if we **(p.177)** look at some of their particular views, we might find more doctrinal uniformity among our Cartesians.

Some Cartesian Simple Notions

(1) I have shown that almost all late Scholastics thought that what is said about God and creatures is said analogically, not univocally, and that Descartes asserted that we cannot attribute substance univocally to God and his creatures, meaning that there is no sense that can be distinctly understood as common to both. Descartes' denial of univocity was clearly ambiguous about whether he meant the attribution as analogical or equivocal, but he is usually taken to be a proponent of analogical predication. I have indicated, however, that Spinoza was a proponent of equivocal predication, both in his own voice and as a stand-in for Descartes in the *Metaphysical Thoughts*. The views of Le Grand and Régis can add something to the debate by allowing us to determine whether, of Descartes' followers, Spinoza was alone in thinking that equivocal predication was the best way to interpret Descartes' ambiguous pronouncements against univocity.⁸¹

Le Grand devotes a long chapter to *How the Name of Substance agrees to GOD and the Creatures;* let us follow his reasoning. According to Le Grand, he supposes with logicians that a name can be attached to a thing in different ways. Univocally, when it agrees with many things for the same reason. Equivocally, when we call many things that are distinct by the same name for various reasons: "As when in Latin we use the name *Gallus*, to signifie a *Cock* and a *Frenchman;* or when we use the word *Parabola*, to signife an *Allegory,* or *Similitude,* and a *Geometrical Figure.*"⁸² Analogically, when we give the same name to many things, but to one principally and to the other secondarily, "as when we say that an *Animal,* a *Pulse,* and *Physick* are Healthful; for *Health* principally and chiefly agrees only to an *Animal,* to the *Pulse* as it is a sign of it, and to *Medicine,* because it procures it."⁸³ Having set down these definitions, Le Grand denies first that the name substance can agree with God and creatures univocally. His reasons are Cartesian. God

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is a substance independent of any others and all other substances are dependent on him: "The Idea of *Substance* is the conception of a Being subsisting of, or by itself; but there is no *Creature* so exists by it self, as to be sufficient for its own Existence, or so powerful, as to be able to keep and preserve it self: Wherefore the Name of *Substance* cannot Univocally agree to *God* and the *Creature*."⁸⁴ As a result, he concludes that the word "being" is applied equivocally:

And if with more attention we consider the Matter, we shall find that *God* and the *Creature* do not agree in the Idea of any Genus whatsoever; and that the word *Being, Ens*, which is commonly by *Logicians* attributed to *God* and the *Creature*, is perfectly *Equivocal*; and that the *Equivocation* is not more plain that the word *Dog*, when attributed to a *Constellation* in Heaven, and to a *Beast* on Earth; or in the Latin word *Jus*, which signifies *Law* or *Right*, and *Broth*, than **(p.178)** in the word *Ens*, or *Being*, when given to a Being which is of it self and one that is from another and altogether dependent.⁸⁵

Le Grand simply does not consider the possibility that the attribution could be analogical. He denies an objection to the effect that the inequality between God and creatures arises from mere differences, arguing that "Dependency is involved in the Essential Conception of a Creature,"⁸⁶ but this is a rejection of an argument for univocal attribution. He also asserts that substance agrees univocally to all creatures. His own thought must be encapsulated in the section titled "God is above Substance":

Wherefore *S. Denys* calls GOD *Super-substantia*, and *Super-Ens*, (*Above-substance*, and *Above-entity*) because he is raised above all Substances, and separate and distinct from all other Things whatsoever. Accordingly he that would make a true Scheme of the *Predicaments*, must set down *Ens à se*, or *Self-existent Being* by it self, and distinct from the Series of other things; and afterwards *Ens ab alio*, or a *Being* that is from another, as the Original of *Differences* Because the Name of *Entity*, or *Being*, only agrees with the Being, which is of it self, and can only Equivocally be assigned to *Creatures*, that have their Being from another.⁸⁷

Régis follows a similar line of reasoning. He also uses the Cartesian position to argue for equivocal predication. Having proved the existence of God and briefly discussed God's attributes, he appends some Reflections on Metaphysics, calling the first section "*That the Words* Being, Substance, *and* Thought *are equivocal between God and creatures.*" He states:

Since the thought that constitutes the nature of God is independent and perfect and the one that constitutes the nature of the mind is imperfect and dependent on God, to mark this difference I will say that the thought that constitutes the nature of God subsists in itself and by itself and the one that constitutes the nature of mind subsists truly in itself but not by itself. From which it follows that the word *substance* will be equivocal with respect to God and body and mind; the word Being will be also: for even though I say equally of God, body, and mind that they are *beings*, and that consequently the word being seems to signify something in

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common between God, body, and mind, it, however, does not. 88

Régis extends the equivocation between God's perfections and those attributed to body and mind and ends his discussion by affirming the following maxim: "When I wish to talk about God with exactness I must not consult myself nor speak in the ordinary fashion, but elevate myself in mind above of all creatures, to consult the vast and immense idea of the infinitely perfect God."⁸⁹ Later on, when referring to God's will and ours, he indicates that the order that he had regarded as preceding God's decree and as (p.179) serving as rule for his conduct "is a pure fiction of his mind and a bad habit" he had contracted "in judging God as he judged himself." We must not judge God as we judge ourselves since we are constrained to follow a certain order in thought, while God "is not required to regulate himself according to this order, because this order is nothing other than his own will."⁹⁰ Both Régis and Le Grand understood Descartes' rejection of univocal predication to entail equivocal predication. Perhaps the scales should now tip in their direction. Even though every ramification resulting from thinking that substance is equivocal between God and creatures is not absolutely clear, given the interpretations of the first Cartesians, equivocal predication should be considered seriously as what Descartes might have intended. Thus, Descartes' passages in Meditation III about the mark of the craftsman on his work also need to be reconsidered.

(2) The Cartesians agreed about the theory of distinctions; Du Roure, Le Grand, and Régis all thought that there are three kinds of distinction, along with Descartes (at least in his post-1640 work), and against the view of many late Scholastics, who argued for only real distinction and distinction of reason. The differences between the Cartesians are slight. Both Du Roure and Le Grand discuss three kinds of distinction, real, modal, and of reason. Two substances are really distinct if we can know one clearly and distinctly without the other.⁹¹ And both divide the modal distinction into two: between the mode and the substance it diversifies and between two modes of the same substance.

We can have a clear and distinct idea of the substance without thinking of the mode that depends on it; but, in contrast, we cannot conceive the mode distinctly without the substance that is its subject. ... As for the distinction between the two different modes of the same substance, we should understand that we can know one of the two modes without the other—for example, motion without shape and shape without motion—but we cannot think distinctly about either of them without thinking of the substance on which they depend.⁹²

The one difference between Du Roure and Le Grand is that the latter also discusses the case of the distinction between a substance and the mode of another substance (when discussing a mode and its subject and two modes of the same substance). He decides that this distinction is "rather to be called a *Real Distinction*, than *Modal*; forasmuch as That *Mode* may be clearly understood without the other, and hath no dependence on the *Substance*, as not affecting or modifying it."⁹³ Finally, both discuss the distinction of reason—"which can barely be called a distinction"⁹⁴—and is used to conceive the same thing in different ways. Le Grand adds that "two *Attributes* of the same Substance are

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distinguish'd only by *Reason*, if they be such as that the Notion of the one cannot **(p.180)** be clearly conceived without the other; as *Justice* and *Mercy* in God. And these are said to be *Formally* distinguish'd, because their Formal idea's or definition are distinct or diverse."⁹⁵ In this way, Le Grand creates another distinction within the category of real distinction. That is the main difference between Régis and the other two Cartesians, in that he finds three distinctions called real, along with the formal or modal, and distinction of reason:

I recognize even that there are as it were three kinds of real distinction, namely generic, specific, and numeric. The generic distinction occurs between things that do not have the same genus, such as between man and stone. The specific distinction occurs between things that have some common attribute, such as between man and horse, which are both animals. And the numeric distinction occurs between things that have a same genus and a same difference, but do not have the same common accidents, which is how one drop of water differs from another drop of water.⁹⁶

Régis also specifies that the distinction of reason is multiple and occurs between substances and their essential attributes (i.e. between substance and extension or thought), or between substances and their external modes (i.e. between substance and number or duration), or between general and singular things (between stone or man and a particular stone or man).

(3) Seventeenth-century Scholastics, I have said, were divided between Thomistic and Scotistic views on the principle of individuation; that is, between quantified matter and an individuating form or soul as principle of individuation. Descartes seemed to have had a two-tiered view of individuation, depending upon whether one is dealing with informed or non-informed matter. So the human body is individuated by the human soul, but motion would individuate non-informed matter. But Descartes' two-tiered system was not widely known, as can be shown by the views of our textbook writers. Du Roure does not deal with individuation in his Metaphysics, but begins his Physics by asserting that "nothing is sensible except by motion, or even only motion diversified by shape, situation, and the other accidents of bodies. ... But these various qualities we sense cannot be distinct from motion, which alone can be received in the subject and in the organ of sense and which by its diversity can give us extremely different knowledge of them."⁹⁷ Du Roure reiterates the same point in his *Abrégé* ending with a paraphrase of Descartes' article 23 of *Principles*, II, "That all the variety in matter, or all the diversity of its forms, depends on motion":

These five primary forms of bodies: motion, or their different application, rest, etc., are the accidents of matter considered generally; but they establish the essence of its parts, of a sword, for example, or of some other body, whether natural or artificial, sensible or insensible. All the diversity of corporeal things depends similarly on the innumerable diversity of these same **(p.181)** forms. Even the action of bodies is only their motion, resistance [being] their motion or their rest; finally, their effects, other than those two forms are the three remaining ones [that

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is, shape, situation, and size].⁹⁸

Le Grand and Régis give extended discussions of the five universals, more or less along the line of Descartes' *Principles*, I, articles 58 and 59, but these do not add much to their views about individuals.⁹⁹ That does not prevent Le Grand from asserting in his Physics:

Tho' *Motion* be only a *Mode* of a *Body*, and cannot be conceiv'd to be without it, yet it is so much conducing to the *Beauty* and *Harmony* of the *World*, that all the Matter in it would be without *Form*, if it were not divided by *Motion*, and cloath'd with those *Affections* we find in the several parts of it. ... For there is no question, but that from the Beginning, *Motion* made the distinction of *Bodies*, and gave them those *Qualities* and *Affections*, which we find in them.¹⁰⁰

There is further evidence that Cartesians did not know of Descartes' two-tiered view of individuation. Some of them reacted negatively to what they thought was the inadequacy of Descartes' criterion of individuation as motion. An example of this would be Gérauld de Cordemov whose fame in part rested on his attempts to extend Cartesian philosophy to the fields of language and communication and his advocacy of Cartesian orthodoxy, such as his defense of the doctrine of animal-machines and the consistency of Cartesianism with Genesis; above all, Cordemov is known for the views he propounded in the 1666 Le discernement du corps et de l'ame, which expounded upon Cartesian physics. In the work, Cordemoy offered a variation of Cartesian mechanical philosophy—everything in the physical world is explained in terms of the size, shape, and motion of particles-but one that required atoms and the void. He rejected the indefinite division of body and the Cartesian identification of space and extension. He distinguished body and matter, matter being an assemblage of bodies, and claimed that bodies as such were impenetrable and could not be physically divided or destroyed. These views were intended as an answer to his criticism of the Cartesian principle of individuation of bodies as shared motion. According to the principle, a body at rest between other bodies would have to constitute a single body with the other bodies, even though we have a clear and natural idea of a body at rest between other bodies. Cordemoy proposed that shape, rather than motion, distinguishes the indivisible atoms.¹⁰¹

In 1685, Leibniz commented upon Cordemoy's atomist solution to the Cartesian problem of individuation; although he appreciated Cordemoy's criticism of Cartesianism, Leibniz thought Cordemoy had not gone far enough with his solution. As he said, **(p.182)**

These are difficulties for Cordemoy himself: let us suppose two triangular atoms come into contact and compose a perfect square, and that they rest next to each other in this way, and let there be another corporeal substance or atom, a square one equal to the other two. I ask, in what respect do these two extended things differ? Certainly no difference can be conceived in them as they are now, unless we suppose something in bodies besides extension; rather they are distinguished solely by memory of their former condition and there is nothing of this kind in bodies.¹⁰²

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This Leibnizian doctrine has its roots in an essay from 1676 titled Meditatio de Principio Individui. There Leibniz also considers two rectangles or two triangles coming to constitute two indistinguishable squares, as an example of different causes producing an effect that is perfectly the same. Of his two squares Leibniz asserts "neither of these can be distinguished from one another in any other way, not even by the wisest being." Based on the principle that the effect involves its cause "in such a way that whoever understands some effect perfectly will also arrive at the knowledge of its cause," Leibniz argues that "if we admit that two different things always differ in themselves in some respect as well, it follows that there is present in any matter something which retains the effect of what precedes it, namely a mind." Thus, for matter to be individuated, it has to be connected to a mind that will retain the memory or traces of its construction. Leibniz concludes: "This argument is very fine and proves that ... we cannot think of anything by which matter differs, except by mind.... This principle is of great importance."¹⁰³ Of course, the mind Leibniz is referring to could be either inside or outside the thing, a universal soul or a mind, individual soul, substantial form, or individuating form; that is, a haecceity. Leibniz chooses to locate the principle of individuation inside the thing. You can see Leibniz making use of his principle of individuation in the 1686 Discourse on *Metaphysics*. Leibniz claims that God chooses the perfect world, one made up of individuals with actions and passions, since actions and passions properly belong to individual substances. What God creates are subjects; that is, individuals, like Alexander, whose individual notion or *haecceity* God sees. And what God sees in this individual notion or *haecceity* is "the basis and reason for all the predicates that can be said truly of him, for example, that he vanguished Darius and Porus"; so we can say that from all time in Alexander's soul there are vestiges of everything that has happened to him and marks of everything that will happen to him and even traces of everything that happens in the universe. Among the propositions to which Leibniz is committed is the claim that no two substances can resemble each other completely and differ only in number—solo numero. In an earlier draft Leibniz had added: "that if bodies are substances, it is not possible that their nature consists only in size, shape, and motion, but that something else is needed."¹⁰⁴ Now, all of this is aimed squarely at Descartes' theory of matter and its consequent principle of individuation. And, according to Leibniz, the inadequacies of Descartes' theory of matter could not be resolved by atomist moves.¹⁰⁵

(p.183) Du Roure, Le Grand, and Regis' views about individuation, Cordemoy's criticism of Descartes on the matter, Leibniz's criticism of Cordemoy, and Leibniz's own attempts at a principle of individuation seem all to develop in a context in which Descartes' two-tiered principle of individuation is simply unknown.

(4) Du Roure, Le Grand, and Régis all think that we know God, but cannot comprehend him.¹⁰⁶ And all of them—or at least Du Roure and Le Grand—think that the a priori proof is sound.¹⁰⁷ Le Grand's chapter on the a priori proof is interesting and it even includes a discussion of Gassendi's criticism (with Gassendi named as author), which denies that existence is a predicate, and the unnamed criticism of those who may claim that the essence of God is impossible: "it will lye upon them to prove the Contradiction it implies."¹⁰⁸ As far as I can tell, Régis does not mention the a priori proof in his textbook.

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But I do not think that this is because he does not accept the a priori proof. After all, he defends it against the attacks of Daniel Huet in his *Réponse à la Censure de Monsieur Huet*.¹⁰⁹ Instead, Régis' neglect of the a priori proof probably stems from his treatment of the existence of God as just an effect of his realism about the representative contents of ideas. The existence of bodies and the a posteriori proof of God's existence both follow from his view of ideas; the existence of God is not the result needed to prove the existence of bodies.

There are many points of convergence among the main Cartesians in their interpretations of Descartes' metaphysics, such as their perhaps suprising views of the equivocal predication holding between God and creatures and their non-surprising accounts of distinctions and lack of extended discussions about the principle of individuation. At bottom, Régis seems the more radical of the three, consciously departing substantially from Cartesian doctrine and order. The anonymous author of *Discours sur la Philosophie* rightly states that "Régis is not at all dedicated to Descartes' authority, but distances himself from his opinions when he sees that they are not based on sufficiently strong or sufficiently evident reasons to convince the mind."¹¹⁰

4.3. Some Elements of Cartesian Physics

As with the section on Descartes' physics, our discussion of Cartesian physics will be limited to such topics as the common properties of natural things, the relation between mathematics and physics, and hypotheses and moral certainty.

(p.184) Common Properties of Natural Things

Descartes' doctrines on infinity and void were under great pressure in the second half of the seventeenth century. There were infinitists around, such as Spinoza and Leibniz, and many vacuuists, such as the Gassendists and later the Newtonians. We have already seen the Cartesian Cordemoy accept atomism; he accepted the void as well: "Bodies that make up aggregates, liquids, and masses are not everywhere so close to one another that they do not leave some intervals in some places. ... It is not necessary that these intervals be filled, and one can conceive there being no bodies between bodies that are not touching."¹¹¹ Still, on the whole, the Cartesians maintained Descartes' views on the infinite, the indefinite, and the finite, and on place and the void. But there were some cracks around the edges, especially with Régis.

One can find exemplary defenses of Descartes' view of void in Rohault and Le Grand, both making excellent use of Descartes' doctrine of the creation of the eternal truths where questions of possibility and impossibility are said to be with respect to our conception and not for God. Rohault calls the vacuum impossible, given the Cartesian notion of matter he adopts: "For by a *Vacuum* they mean a Space void of all Matter; but by Space (or Extension) we mean the same Thing as Matter; and to ask if there can be any Space without Matter, is the same as to ask, if there can be any Matter without Matter, which is a manifest Contradiction."¹¹² Rohault then tackles the question of whether God could by his omnipotence make a vacuum by annihilating all the air in a room and preventing any more air from coming in its place. His answer: "it does not belong to

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us to determine how far the Power of God can extend it self. But if the question be a little altered, and we be only asked, what we *conceive* would follow, if God should annihilate all the Air in a Room, and not suffer any more to enter in its Place? We should return for Answer, ... that the Walls would approach one another so near, that there would remain no Space betwixt them."¹¹³ The same defense of the Cartesian doctrine on void can be found in Le Grand's "Of General Physicks." For example, Le Grand defines vacuum as a "place devoid of body," and so it implies a contradiction for there to be a vacuum, because "where there is no *Body*, neither can there be any *Mode* (**p.185**) of a *Body.*"¹¹⁴ Le Grand then deals with the objections deriving from the possibility of God annihilating the air in a room: "You'll say that God can take away all the Substance, that is contain'd between the Walls of a Chamber, and keep any other Body from entring it; upon which supposition a Vacuum must follow. ... you will say, that the Body which is conceiv'd to be in the *Chamber* or *Vessel*, is something different from the sides that surround it, and therefore one may be separated from the other by the Divine *Power*."¹¹⁵ And in his answer Le Grand is even more explicit than Rohault in his use of the eternal truths: "I dare not say that any thing is impossible to *God*, or that he cannot make a Mountain without a Valley: But this only I assert, that God hath made my Mind such, that I cannot conceive how a Mountain should subsist without a Valley; or how Five and One should not make Six."¹¹⁶

Régis' account looks almost identical to those of Rohault and Le Grand. He also calls the void of the philosophers impossible because it would be a space without matter, and space, extension, and matter "taken absolutely" mean the same thing. He then tackles the objection that God can create a void by his absolute power. His answer seems to presuppose the doctrine of the eternal truths, but also looks like he is trying to have it both ways: "To which we reply that God's absolute power has no limits but that nevertheless we do not conceive that it can be extended to the void of the philosophers, which, containing a manifest contradiction, cannot be the effect of a genuine power."¹¹⁷ It is not clear what he means by "the void of the philosophers cannot be the effect of a genuine power." This may be nothing, but it looks somewhat more significant when it is coupled with Régis' unorthodox view about the infinity of the world.¹¹⁸

We should first establish that Régis knows Descartes very well and also understands Scholastic terminology and doctrines very well. For example, he defends the infinite divisibility of quantity and defends himself against the conclusion that the division can be completed: "It is evident that in a finite thing the division will be … infinite, if it is accomplished by means of proporitional parts, there being no such parts, however small, that cannot be divided by half." The argument against this would be that once one agrees that there are infinite parts in a body, there is no longer a means of conceiving the body as finite. Régis answers:

All geometers know that a quantity can be increased to infinity without ever becoming equal to an other quantity not being increased. For example, if one adds a half to a unit, then a fourth, then an eighth, and so forth, always adding the half of

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what one added previously, we could (p.186) increase this unit infinitely without it ever becoming equal to the number two; from which it follows that it is not true that the magnitude resulting from proportional parts would be infinite nor consequently that the magnitude one divides by proportional parts would be infinite, as is claimed.¹¹⁹

And he represents Descartes fairly well on the question of the immensity of the world. He argues that it is impossible to conceive that the world has any limits: "at whatever distance from us we can put these limits, we always imagine beyond it some space, which compels us to see that the world extends beyond the limits we have wanted to prescribe for it. We cannot therefore propose to ourselves a world so large that we cannot imagine it larger."¹²⁰ Régis proceeds to reject the plurality of worlds as impossible: "it is impossible to conceive plural worlds because the one in which we exist occupies more space that we could imagine for it." But one can detect two differences between Régis and Descartes: (1) Régis does not use the word indefinite in describing the world; and (2) he specifically limits the assertion to God's consequent power: "we are not dealing here with God's extraordinary power."¹²¹

In fact, Régis specifically abandons Descartes' principle of the indefinite extension of the world as soon as he receives any criticism for it. In chapter 5, on Body and the Void, of his Censura Philosophiae Cartesianae, Huet attacks Descartes' notion of the indefinite, saying that it is a subterfuge on Descartes' part to hide his doctrine from the scrutiny of theologians. According to Huet, Descartes "calls indefinite what he does not know to be finite or infinite." So, when Descartes calls the world indefinite, it is because he does not know whether it is finite or infinite; thus he cannot know whether there is enough room for plural worlds or not. Moreover, everything is finite or infinite. If the world is finite, "his whole doctrine concerning body and void collapses." And if his world is infinite "he stands convicted of all the errors I have shown to spring for those distorted principles." And Huet is clear that it manifestly follows from Descartes' "distorted principles that the world is infinite: For what else is it to be infinite than to lack a boundary and not to be enclosed within any limits?"¹²² Régis in his reply (*Réponse au livre qui a pour titre* Censura Philosophiae Cartesianae) denies that for Descartes the indefinite is understood of a thing when he does not know whether it is finite or infinite. He affirms that Descartes "was obliged to recognize that the world has no limits and is truly infinite, that is, such that one cannot conceive anything larger or more extended." Régis then limits the word indefinite to parts of the universe whose size is such that Descartes could not determine its limits and cites (p.187) Principles, I, article 29, at length to prove the point. He concludes that "Descartes used the word indefinite only to talk about particular things and not to talk about the world in general."¹²³ Ultimately, Régis agrees with Huet that whatever has no limits is infinite. The world is infinite and, as a result, there can be no void or plural worlds. Régis asserts this in spite of Descartes' statements in Principles, I, article 27, "We call these things indefinite rather than infinite in order to reserve for God alone the name infinite," and Principles, II, article 21, "The extension of the world is likewise indefinite."

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The Relation between Mathematics and Physics

The Cartesians integrate Descartes' various comments about the relation between mathematics and physics into their own accounts. Jacques Rohault discusses some of these relations in the preface to his *Treatise on Physics*,¹²⁴ beginning with a rebuke of Scholastics for not teaching mathematics in their schools: "The Fourth Defect that I observed in the Method of the [School] Philosophers, is the neglecting Mathematicks to that Degree, that the very first Elements therof are not so much as taught in their Schools. And yet, which I very much wonder at, in the Division which they make of a Body of Philosophy, they never fail to make Mathematicks one Part of it." He then formulates the argument we have already seen in Du Roure's *Logic* about the use of mathematics in general:

Now this Part of Philosophy is perhaps the most useful of all others, at least it is capable of being apply'd more Ways than all others: For besides that Mathematicks teach us a very great number of truths which may be of great Use to those who know how to apply them: They have this further very considerable advantage, that by exercising the Mind in a Multitude of Demonstrations, they form it by Degrees and accustom it to discern Truth from Falsehood infinitely better, than all the Precepts of Logick without Use can do. And thus those who study Mathematicks find themselves perpetually convinced by such Arguments as it is impossible to resist, and learn insensibly to know Truth and to yield to Reason.

In large part, this is Rohault's take on Descartes' justification for mathematics outside the tree of philosophy: exercising the mind (doing crossword puzzles and the like). But Rohault goes a bit further, justifying the use of mathematics in natural philosophy—indeed, in all arts—with two additional arguments:

First, that as there is a natural Logick in all Men, so is there also natural Mathematicks, which according as their Genius's are disposed, make them more or less capable of Invention. Secondly, That if their Genius alone, conducted only by natural Light, will carry them so far, we cannot but hope Greater Things from the same Genius if the study of Mathematicks be added to its natural Light, than if that study be neglected. And indeed all the propositions in Mathematicks are only so many truths, which those, who apply themselves to them, come to the Knowledge of by good Sense.

This offers a positive role for mathematics that does not refer expressly to Cartesian metaphysics. It demonstrates Rohault's recognition (shared by Descartes) that **(p.188)** mathematics and physics rely on the same intellectual faculties.¹²⁵ But it is not an argument to the effect that the method of physics is the same as the method of mathematics or that mathematical truth or mathematical properties are the basis for physical truth or physical properties (as Burtt and Dijisterhuis had it).

Rohault's generally positive view is not reflected in the work of his follower, Régis. Régis starts by demarcating between mathematics and physics, specifically asserting that he has

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avoided all mathematical questions in his philosophy:

Those who read this book will more easily experience its flaws if they do not stop at equivocal words, ambiguous definitions, or any idea that is foreign to Philosophy, given that we have even purposely avoided Mathematical questions, both because they are little understood by the majority of those who want to apply themselves to Philosophy, and because we all too often confuse them with purely Physical questions, though they are of an entirely different nature. For one is not satisfied in Mathematics by knowing that some things have greater magnitude than some other others things; we claim also to know with evidence the exact ratios holding between them, or precisely by how much they are greater, which does not at all concern Physics.

Régis continues his demarcation between physics and mathematics, accepting the usefulness but denying the importance of mathematics to physics, stressing the experiential basis of physics, in contrast with how geometry is usually practiced: "one can be a good Physicist without being a great Geometer, but one cannot be a great Geometer without being a good Physicist, at least if we have Geometry consist (as we must) in demonstrations based upon facts, or on constant truths; for if we have it consist (as is usually done) in demonstrations based on arbitrary assumptions, nothing prevents a bad physicist from being a good geometer."¹²⁶

Unlike Rohault and Régis who emphasize the empirical aspects of natural philosophy,¹²⁷ Le Grand is interested in the standard question of the certainty of natural philosophy (what he also calls physiology); he proceeds very much in the spirit of a Scholastic, substituting Cartesian terminology and doctrines. He has considered the nature of God and inquired into his attributes:

PHYSIOLOGY comes next to be considered by us, which contemplates *Natural Things*, and deduceth their *Causes* from the *first Original*. ... Now that *Physiology* is a Species of *Science*, and is conversant with things that are True and Necessary, appears from the Demonstrations that are made of *Natural Things*; the Certainty whereof depends on the Stability of Things that are defined, and supposeth their determinate Essence.¹²⁸

Le Grand then attempts to answer the objection: since bodies are only perceived by the senses and the senses may represent false things to the understanding, how can the certainty required for science be had in natural things? His answer is that: **(p.189)**

It is False that *Material Things* are known by the *Senses* ... to speak properly, nothing is conveigh'd from things without us, by the *Organs of Sense*, to our *Minds*, save only some *Bodily motions*, by which the *Idea's* of *Objects* are offer'd to them. ... Wherefore, *Bodily things* are not known by the *Senses*, but by the *Understanding* alone: So that to be sensible of a *Material Substance*, is nothing else, but to have an *Idea* of it, which is not the work of the outward *Senses*, but of *Cogitation*.¹²⁹

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The further objection is then that natural philosophy treats material things as changeable, which seems inconsistent with the notion of science as certain and perpetual knowledge. Le Grand's answer is that:

Nevertheless we must say, that *Natural Philosophy* is indeed a *Science*, because the *Nature* of a *Science* is not consider'd with respect to the things it treats of, but according to its *Axioms* of an undoubted *Eternal Truth*. For tho' the things which *Physiology* handles, be changeable; yet the *Judgments* we make of them are stable and firm; and consequently the Truth we have of them is *Eternal* and unchangeable.¹³⁰

Le Grand gives as examples of these indubitable and constant truths propositions such as "all that is bodily is changeable" and "every mixed body is dissoluble." In this way, he rejoins here Descartes' view from the end of *Principles*, part II:

Forasmuch as every *Science* hath a *Subject*, about which it is conversant, and to which, whatsoever is handled in the same may be attributed either as *Principles*, *Parts* or *Affections*, we say that the *Material Subjects of Physiology*, are natural *things*, and that *Magnitudes*, *Figures*, *Situation*, *Motion*, and *Rest* are the *Formal Subject* of it; ... Wherefore, if a *Natural Philosopher* considers nothing in matter besides these *Divisions*, *Figures* and *Motions*, and admit nothing for *Truth* concerning them, which is not evidently deducible from common Notions, whose *Truth* is unquestionable, it is altogether manifest, that no other *Principles* are to be looked for in *Natural Philosophy*, than in *Geometry* or *abstract Mathematicks*; and consequently that we may have as well Demonstrations of *Natural Things*, as of *Mathematical*.¹³¹

Let me repeat the last thought: as long as we limit ourselves to what is deducible from common notions, we may have demonstrations of natural things as well as those of mathematical things. Régis has an exemplary exposition of the same Cartesian view, delineating carefully among metaphysics, mathematics, and physics:

Metaphysics not only serves the soul to make itself known to itself, it is also necessary for it in order to know things outside it, all natural sciences depending on metaphysics: mathematics, Physics, and Morals are founded on its principles. In fact, if Geometers are certain that the three angles of a triangle are equal to two right angles, they received this certainty from Metaphysics, which has taught them that everything they conceive clearly is true and that it is so because all their ideas must have an exemplary cause that contains formally all the properties these ideas represent. If Physicists are certain that extended substance exists and that it is divided into several bodies, they know this through Metaphysics, which teaches them not only that the idea they have of extension must have an exemplary cause, which can only be extension itself, but also that (**p.190**) the different sensations they have must have diverse efficient causes that correspond to them and can only be the particular bodies that have resulted from the division of matter.¹³²

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The Cartesians found Descartes' philosophy enormously important for the seventeenth century. It may be one thing to write about Descartes' deepest intuitions as we understand them and another to explicate his influence on his followers; that is, how he was understood by others. When the issue is an account of the "scientific revolution," one's narrative should resonate with the latter. It thus becomes relevant to understand how Descartes was understood by his followers. When we tell the story of the seventeenth century, we need to capture what these thinkers found so appealing about Descartes (and what the anti-Cartesians found so dangerous). And when we do so, we find also many different views about the relations between mathematics and natural philosophy: that natural philosophy can develop a method similar to that of mathematics; that propositions in natural philosophy can be as certain as those of mathematics; that mathematics can be of use in sharpening one's mind for the practice of philosophy; that mathematics has a mode of exposition that is particularly persuasive; that philosophy can be based on the same clear and distinct ideas as those on which mathematics is based. But we do not find the view that the method of philosophy is reducible to the method of mathematics or that philosophy is founded in mathematics. The generally positive views of mathematics in Descartes and the Cartesians do not legitimate a historical or historiographical thesis of the mathematization of nature in the fashion of Burtt and Dijksterhius (and Koyré).

Hypotheses and Moral Certainty

Once one understands Descartes' peculiar notion of moral certainty and the role it plays in his system, it is easy to see what can become of it in the hands of followers who might discard some aspects of the method of doubt. The rejection of hyperbolic doubt caused some Cartesians no longer to distinguish between the absolutely and the morally certain in the fashion of Descartes—that is, between that which we cannot doubt and that about which we have no doubt although we could doubt it—and thus to treat principles on a par with one another. As a result, many Cartesians became more empirical and pursued a limited hypothetico-deductive method.¹³³

(**p.191**) We can see the method of doubt being toned down in Régis' reply to Pierre Daniel Huet's critique of Cartesian philosophy. Huet rejects the method of doubt because he is a skeptic and would rather just remain in doubt:

Both he and they [Descartes and the skeptics] saw that we must doubt; but he stopped doubting when it was most necessary to doubt, namely at a principle which is not any less uncertain than all the other things that led him to doubt. They continue to doubt this principle and believe that they have many reasons to doubt it. Descartes could not have reproached them if he knew their reason, which is that nothing appears clear enough to them to be admitted as true.¹³⁴

Régis in his reply asserts that Descartes has not abandoned his promise to doubt everything when he accepts something as true after having examined it.¹³⁵ He claims that Descartes never accepted the general rule to hold everything as false, but merely resolved to consider as false whatever appears doubtful. He distinguishes between real

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doubt, arising from the nature of things, and a feigned, methodological doubt—what Descartes called hypothetical, hyperbolic, and metaphysical doubt—arising from his resolution to doubt.¹³⁶ In keeping with this interpretation of Descartes, he asserts that Descartes only held the rules of logic as false "hypothetically" in order to examine them. He asks rhetorically: "who can prevent Descartes from holding them as true, if they have appeared to him as such, after he has examined them?"¹³⁷

The early Cartesian Du Roure¹³⁸ begins his Physics with a discussion of moral certainty, clearly weakening the notion to mere probability and introducing physical certainty as a third element. There is a full exposition of his grades of certainty in his *Abrégé*: "There are three kinds of evidence. One is Moral, when the contrary does not happen ordinarily. The other is Physical, when the contrary never happens. The last is Metaphysical, or absolute, when the contrary can never happen. Of these three Propositions: (1) This man will die before he reaches one hundred years old, (2) he will **(p.192)** die, (3) he can die, the first is Morally evident and certain, the second Physically, and the last Absolutely."¹³⁹ This probabilistic and empirical epistemology is affirmed by Du Roure even in his *Logic*: "whoever makes use of reason more than experience or reflections on experiences often falls into error."¹⁴⁰ So with Du Roure we have somebody who falls into the Cartesian camp, though he defends a view that might be thought at variance with orthodox Cartesianism, displaying an epistemology that looks more like Gassendist empiricism.

Of course, not all Cartesians followed the same path in their espousal of probabilism and a hypothetico-deductive method in physics. Here is a typical paragraph supporting a hypothetico-deductive method ending up with high probability, not absolute or moral certainty (though it sounds very much like a considerably weakened moral certainty in the fashion of Du Roure). It is from the preface to the second edition of Christiaan Huygens' *Traité de la Lumière* (1690):

One finds in this work these kinds of demonstrations that do not produce as great a certainty as those of Geometry, and that even differ much from geometrical demonstrations, given that geometers prove their propositions by certain and incontestable principles, while here principles are verified by conclusions derivable from them; the nature of these things does not allow any other treatment. It is always possible, however, to attain in this way a degree of probability, which very often is little short of complete evidence. This is the case when things demonstrated by these assumed principles correspond perfectly to the phenomena that experiment has brought under observation—especially when there are a great number of them, and further, principally, when one can devise and predict new phenomena that should follow from the hypotheses one uses, and one finds that the effect corresponds to our expectations. But if all these proofs of probability are encountered in what I propose to treat, as it seems to me they are, this should be a very strong confirmation of the success of my inquiry, and it is scarcely possible that the facts are not just about as I represent them.¹⁴¹

(p.193) Huygens, who is not an orthodox $Cartesian^{142}$ or a Catholic, has his own reasons for adopting a hypothetico-deductive method leading to high probability; these

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PRINTED FROM OXFORD SCHOLARSHIP ONLINE (www.oxfordscholarship.com). (c) Copyright Oxford University Press, 2015. All Rights Reserved. Under the terms of the licence agreement, an individual user may print out a PDF of a single chapter of a monograph in OSO for personal use (for details see <u>http://www.oxfordscholarship.com/page/privacy-policy</u>). Subscriber: University of Arizona Library; date: 12 September 2015 do not have to be the same as what would motivate Cartesians in a Catholic country. But he is here following a path taken by many followers of Descartes, Du Roure, and Régis, among others. 143

(p.194) 4.4. The Cartesians and Ethics

As I have said in the Preface to this book, Du Roure has the distinction of having written the first Cartesio-Scholastic textbooks that include an *Ethics* or *Moral Philosophy*.¹⁴⁴ The *Morale* from his *Philosophy* is divided into two parts, Moral Philosophy following the Order and Opinions of the Schools and Moral Philosophy Demonstrated, but Du Roure tells us that the title to the first part is somewhat of a misnomer, since it includes the opinion of scholars both inside and outside the Schools.¹⁴⁵ And, in its portion on felicity, he devotes a chapter on the supreme good, explaining Scholastic doctrine, but also adding sections on the views of Gassendi and Descartes.¹⁴⁶ The Descartes fragment happens to be a summary of Descartes' letter to Elisabeth of 4 August 1645;¹⁴⁷ as Du Roure states, "Descartes teaches, in his letters to Princess Elizabeth, that natural beatitude consists in having the mind perfectly content."¹⁴⁸ Du Roure then, like Descartes, distinguishes between good fortune and happiness,¹⁴⁹ gives an analogy of a vessel that can be filled to capacity with less liquid than another,¹⁵⁰ and lists three maxims useful for acquiring felicity: (i) trying always to use our minds as well as possible to discover what we should do in all the circumstances of our lives;¹⁵¹ (ii) having a firm and constant resolution to execute everything reason advises us, without allowing our passions or appetites to divert us;¹⁵² and (iii) considering that while we are conducting ourselves in this manner, the goods we do not possess are entirely outside our power.¹⁵³ It is interesting that Du Roure knows of (**p.195**) this letter before its publication in Clerselier's edition of the *Correspondence*;¹⁵⁴ although he refers to "Descartes' letters to Princess Elisabeth," that is to "letters" in the plural, he gives an almost complete paraphrase of only the one from 4 August 1645, and he does not seem to be aware of Descartes' other letters about these matters, whether to Elisabeth or not. In the article on Freedom from the section on virtues and vices, Du Roure details Descartes' view about freedom of indifference, as given in the letter of 27 May 1641 (possibly to Mersenne) or in its Latin version of 9 February 1645 (possibly to Mesland).¹⁵⁵ He knows the contents of the 1641 or 1645 letter, though, like us, he does not know to whom the letter was addressed. Unlike his reference to the letter to Elisabeth on felicity, where he identifies the correspondent, in this case Du Roure refers to the two meanings Descartes gives to indifference "in his posthumous works."¹⁵⁶ There follows a paraphrase of the 1641 or 1645 letter.¹⁵⁷ And in the section on passions, he devotes a whole chapter to the passions, according to Descartes, their definition and number, causes and effects, and remedies.¹⁵⁸ The second part on Moral Philosophy Demonstrated is advertised by Du Roure as being inspired by Descartes and Hobbes,¹⁵⁹ but it really comes mainly from Hobbes (from the *De cive*, in particular) and despite Du Roure's enthusiasm, it is unlikely that Descartes and Hobbes could be made to fit under the same umbrella.¹⁶⁰ Du Roure's *Morale*, like his *Logique*, gives the impression of something that has not fully come together.

(p.196) Ten years later, in the first section of the Morale from the Abrégé, concerning

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the good in general, Du Roure defines the good as what is suitable for something, as "health is always suitable for a sick person." He states that the true good is either physical or moral, with physical good as what is independent of human will, and moral good as what is within our control. Happiness turns out to be the state in which we enjoy a variety of pleasant goods that we can reasonably possess. There are goods of the body and goods of the mind. The latter have to do with knowledge and will. Moral virtue turns out to be knowledge accompanied by the firm will to do well: the virtuous person is the one who does and wills the things that must be done. This is as far as it goes; it is a pale echo of Descartes. Du Roure continues with a section on morals about people individually, with discussions of freedom from captivity, the necessities of life, and diversions, and another section on morals in society, including family, commerce, friendship, rights, and laws. He ends up with some axioms concerning what he calls the three parts of morality: ethical, monastic, and political. All of this diverges even further from Descartes' thoughts.

However, in 1667, and then again in revised editions in the 1680s and 1690s, there appeared an anonymous work, *The Art of Living Happily, based on the clearest ideas of reason and common sense and on the very fine maxims of Mr. Descartes*,¹⁶¹ often attributed to the Oratorian, Claude Ameline. The author constructs a Cartesian-style ethics from a variety of sources, but especially from Descartes' letters to Christina and to Elisabeth. Part 1 of the treatise discusses man's happiness to be attained in this life herebelow. The author sets aside the supernatural happiness of saints, in the state of grace, and makes room for a natural and rational kind of happiness that can be attained in this life, in spite of our fallen state. He argues that there are goods to be attained here-below, apart from grace and faith, which, though useless for salvation, permit us to perform morally good acts. These preliminaries allow the author to continue with an extended paraphrase of Descartes' letter to Christina: the only supreme absolute good is God; the goods relative to us are those that depend on us (such as virtue and wisdom) and those independent of us (such as honors, riches, and health); that is, goods of the body and fortune, as opposed to the goods of our mind—understanding and will.

In part 2 of his treatise, the Pseudo-Ameline continues with a discussion of the nature of the human soul. He calls Aristotle's opinion on the subject "dangerous and obscure"¹⁶² and adopts what he calls the Augustinian-Cartesian view that "the soul is a substance that has only thought as attribute, from which one concludes that it is spiritual and immortal."¹⁶³ He **(p.197)** follows the discussion of human souls with a few chapters on Cartesian animal-machines and concludes part 2 with chapters on the two faculties of the soul, understanding and will, again in the style of Descartes. Part 3 of the treatise, on the application and right use of the two powers of our souls, rejoins the discussion of ethics with an extended paraphrase of the letters to Elisabeth. In those letters, given our imperfect knowledge, the truths we needed to keep in mind in order to judge well were the existence of God, the nature of our souls, and our distinctness from every part of the universe. Here these are understood as the three principal truths by which to guide our conduct, toward God, the self, and others, namely: (i) there is a God, on which all things depend; (ii) know thyself; that is, you should know the nature of your soul; and (iii) you

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should prefer the interests of the whole to your particular interests. The Pseudo-Ameline seems to have understood Descartes very well; using Descartes' late correspondence, he attempted to delineate a Cartesian naturalistic ethics based on Cartesian metaphysics; that is, the Cartesian view of the soul and its two functions, all in parallel with and apart from a Christian, supernatural ethics.

At around the same time, Le Grand was publishing his popular version of Descartes' philosophy in the form of a Scholastic textbook, expanding it in the 1670s and 1680s and ultimately having it translated into English.¹⁶⁴ In the preface to the tenth part of the work, Institution of Philosophy, on Ethics, Le Grand states: "I would also have the Reader take notice, that in this Treatise I follow the Sentiments of DES CARTES: and tho' he hath writ but little concerning Moral Philosophy, yet I have a mind to raise this structure upon the Foundation he hath laid, and from what he hath Writ concerning the Soul of Man, and the Passions to discover his Sense of Moral Matters."¹⁶⁵ Le Grand's discussion covers many pages and ranges broadly over many topics. After arguing that external goods are not the good of man, he comes to the main question: What is the highest good of man in this life, and his ultimate end? He considers man in a double state, as a private man or as mankind, the latter of which comprehends all men. The supreme good for all mankind is the concurrence of all perfections of which he is capable; that is, the goods of the soul and body and fortune. But for private man the supreme good is the right use of his reason, which consists in "his having a firm and constant purpose of always doing that, which he judges to be the best." This, of course, is in our power, whereas the goods of body and fortune are not. The proper use of our two main intellectual faculties also produces a satisfaction of mind. The doctrine is encapsulated in the three things we need to observe, which are said to be the foundation of all ethics. The first is that we "strive to attain the knowledge of what we ought to embrace." The second is that "we stand firm and constant to what we have once resolved upon and purposed." And the third is "that we lay down as unmovable ground and principle, that nothing besides our own thought is in our power." Le Grand concludes "that the natural happiness of man is nothing else but that tranquility or joy of mind, which springs (**p.198**) from his possession or enjoyment of the highest good"-which is to understand Descartes very well.

Le Grand expands this ethics in several interesting ways; for one, he significantly extends the discussion into political thought. Thomas Mautner shows persuasively that the last editions of Le Grand's *Institution of Philosophy* came under the influence of Samuel Pufendorf's 1672 treatise, *On the Duty of Man*.¹⁶⁶ Le Grand adds chapters on the duties of citizens to the end of his ethics, in parallel to Pufendorf's work. Unlike Pufendorf, however, Le Grand does not divide the matter into the natural, civil, and Christian realms. He states: "*Moral Philosophy* is commonly divided into three parts, *viz.*, into *Private, Domestic*, and *Politick*. For man may be considered under various respects; *First, as he is a particular man*, that is, as he takes care of himself, and provides for his own *Good; Secondly*, as he is the *Master* of a *Family*, and as he performs the *Duties* incumbent on a *Master* or *Parent*; and *Lastly*, as he is concerned in a *Government* of a *City*, or *Commonwealth*, and the giving [of] *Laws* to others."¹⁶⁷ Le Grand is clear that the "the latter two parts of *Moral Philosophy* are contained in the *former*."¹⁶⁸ Le Grand

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continues his unification of ethics by having it interpenetrated by Christian thought: one has duties toward God, as well as duties toward the self and society. He accomplishes this last move through a doctrine of Laws of Nature, which, according to him, are "impressed upon the Mind of Man" and "conformable to the Light of Nature": "*The Laws of Nature* are nothing else but a *certain Light or Notices which serve to guide and direct us in all particular occurrences, and which are derived from that general Reason, which GOD hath imprinted in the Souls of all Men in their formation.*"¹⁶⁹ There is certainly room enough in Descartes' system for such a move, though this seems an infelicitous extension of Descartes' innate ideas.¹⁷⁰

But this was not the only way to construct a Cartesian ethics and to relate it to Cartesian philosophy and to Christian beliefs. There were other prominent moral systems, inspired by Descartes, produced at the end of the seventeenth century. As I have said previously, Pierre-Sylvain Régis set the standard for Cartesian textbooks with the multi-volume *Système Général selon les Principes de Descartes* (1691). At the time, Régis was considered the main defender of Cartesian philosophy in France and the *Système Général* was very well received, especially Régis' ethics.

Régis, who also follows Pufendorf,¹⁷¹ divides morality into three parts: natural, civil, and Christian, with natural morality holding in the state of nature, civil morality in the political state, and Christian morality in the state of Christianity. He asserts that in the (p.199) state of nature we are driven by our self-preservation, which we love, but that we can rarely preserve ourselves without working with others, so that, for true self-love, you must love your neighbor as you would yourself. Ultimately, you cannot do that without loving God. None of this has much to do with Descartes' views. However, in his Morale, book 2, On the Duties of Man Considered in Civil Society, part 2, "On the Means of Easily Satisfying the Duties of Civil Society," Régis has a small chapter on the "Supreme Good and Happiness of Man in the State of Nature and in Civil Society."¹⁷² There he argues that man's greatest perfection consists in taking pleasure in the supreme good and that the supreme good of man in the state of nature and in civil society consists in "everything that contributes to conserve him by the good use he makes of it while following natural and civil laws."¹⁷³ Régis distinguishes between the supreme good and the good in general: the latter is what the soul can love while using its freedom, whether well or not, whereas the former concerns only those things of which the soul actually makes good use. He then states, "since happiness is nothing other than the enjoyment of the supreme good, man's happiness in the state of nature and in civil society consists in the internal contentment that the soul receives from the good use it makes of the things that contribute to its conservation."¹⁷⁴ Rejoining Descartes, Régis insists that this natural and civil beatitude is the only contentment that is entirely in man's power, whereas the goods of body and fortune do not depend at all on this power. Thus the contentment relates wholly to two things alone, namely to understanding and to will:

but since it is not in man's power to possess the knowledge he is missing, only man's free will remains as that of which he can absolutely dispose. And it is not possible for him to dispose of it better than when he has a constant resolution to do

exactly all the things that contribute to his conservation, following what the natural and civil laws prescribe for him. It is that and that alone which, properly speaking, deserves praise and glory, and from that alone results the greatest and most solid contentment of life. 175

In this way, Régis can capture some of Descartes' ethics, slightly modified, within a frame clearly foreign to it.

Still, Régis' frame accomplishes some work that can be thought as Cartesian. According to Régis, pagan philosophers, who consider only civil morality, and Christian philosophers, who examine only what concerns Christianity, have an imperfect idea of morality, since Christian morality supposes civil morality and civil (**p.200**) morality supposes natural morality. In fact, Régis proposes to show that the civil state depends on the natural state, insofar as the civil laws are based on particular laws of nature. As for the divine laws, Régis treats them separately according to whether they belong to the Old or New Testament. He reduces the Old Testament laws to two kinds, those belonging to the Decalogue and political or ceremonial laws. He argues that "the precepts of the Decalogue concerning mores are nothing other than the natural laws in written form, and that the political, judicial, and ceremonial laws concerning the Jewish people alone were true civil laws." According to Régis, "this shows that under God's rule in the old Testament, divine laws are in no way contrary to the natural and civil laws."¹⁷⁶ As for the divine laws in the New Testament, Régis proposes either to reduce them to Old Testament laws or to prove again that they are "no more contrary to the divine and civil laws than were God's commandments under the old Testament."¹⁷⁷ One of Régis' last flourishes is to show that the Christian laws are more holy than the natural and civil laws because they allow us to apply ourselves not only toward our temporal conservation, but also toward our eternal salvation. Thus, Régis' framework allows for a generally naturalistic ethics based on a rational metaphysics. In a twist that seems to go away from Descartes, for Régis, morality, that is natural, civil, and divine laws, is separate from metaphysics. Metaphysics can prove, for example, that God alone can make men happy or that he is the author of pleasure and pain. We could have perfect knowledge of these things, but still be unaware of our duties. We could know "that God is the author of pleasure and pain and not know that we ought to refer pleasure and pain to the glory of God—and that we do refer these to it, as we taste pleasures and suffer pains in conformity with natural, divine, and civil laws."¹⁷⁸

Descartes gave the seventeenth century an open template with which to construct a system of naturalistic ethics based on the science of human nature.¹⁷⁹ Cartesians adopted this template and modified it in various ways to suit their purposes.

Notes:

(1) Simon Foucher to G. W. Leibniz, 30 May 1691; Leibniz 1875–90, i. 398–400.

(2) This Bayle (also discussed in Chapter 1) should not be confused with the more famous Pierre Bayle, author of the *Dictionaire historique et critique*.

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(3) Bayle 1670, Of Logick, 78–81.

(4) "The *first* is, never to receive any thing for true, which is not evidently known to be such, that is, never to take in more into our Judgments, than what presents it self so clearly and distinctly, that we cannot at all doubt thereof. The *second*, to divide each of the difficulties, which we discuss into as many small parts as is possible, and necessary for examining them the better. The *third*, orderly to conduct our Thoughts, by beginning with the most simple and the most easily knowable Objects, and so by degrees to ascend to the knowledge of the more compounded. The *fourth*, to make throughout such complete Enumerations, and such universal Reviews, that we be assured, we omit nothing." Bayle 1670, *Of Logick*, 81.

(5) Poisson 1670, 38.

(6) Poisson 1670, 38.

(7) Le Grand 1694, i. 3.

(8) Du Roure 1665, *Logique*, sect. 87.

(9) There are numerous methods called analysis and synthesis in early modern philosophy, most of which have nothing to do with the various things Descartes called analysis and synthesis: resolution and composition within the method of the *Regulae*, the two modes of demonstration of the *Second Replies*, or the analysis (and synthesis) of the ancients. Scipion Dupleix defines one of the standard Scholastic notions in his *Logique* (1984 [1603]) chapter on analysis and synthesis. Du Roure's analysis and synthesis follow the same lines as what Dupleix describes: "Method is the order of the sciences and of their discourse: where one makes several things out of one, which is called the analytic method, or from several one, which is called the synthetic or compositional method." 1665, sect. 2 (see Chapter 2).

(10) Du Roure 1665, sect. 20.

(11) Du Roure 1654, 45–180 and 181–214 respectively.

(12) Du Roure 1654, 183-4.

(13) *Logica contracta*, as its title suggests, is a short treatise (pp. 911–36 of Clauberg 1968 [1691], ii). See Verbeek 1999, 190, about its genesis.

(14) Although this should not be overstated; there are in fact Cartesian elements in the work: logic is still the art of right thinking, which involves clear and distinct perceptions, right judgment, and these things being brought to memory (Clauberg 1968 [1691], ii. 913).

(15) Clauberg 1968 [1691], ii. 785–7; 2007, 64–8.

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(16) Clauberg 1968 [1691], ii. 796–9; 2007, 86–93.

(17) Clauberg 1968 [1691], ii. 799-801; 2007, 93-7.

(18) Clauberg 1968 [1691], ii. 807–9; 2007, pp. 108–12.

(19) Clauberg was also helped in this by his general view of Descartes' works. Clauberg's second book, *Defensio cartesiana* (1652), was primarily a reply to *Consideratio theologica* (1648), a detailed commentary on Descartes' *Discourse on Method* from an orthodox theological point of view, by the Leiden Professor Jacobus Revius. The *Defensio Cartesiana* provoked a reply from Revius, which Clauberg answered with *Initiatio Philosophi sive dubitatio cartesiana* (1655). In his defense of Cartesianism, Clauberg distinguished between Descartes' popular and his esoteric works; according to Clauberg, the *Discourse on Method* belongs to the first category, while the *Meditations* and *Principles of Philosophy* belong to the second. Thus Clauberg could emphasize the view of logic embodied in the *Principles* (and *Conversation with Burman*), that the Cartesian rules of method are the "principal rules of logic." For more on the relationship between these works and Clauberg's logic, see Savini 2004.

(20) Régis calls his logic "La Logique ou l'art de penser" in parallel with the Port-Royal title. He does not seem very interested in the topic in and for itself; his text is very brief, covering just sixty-two pages of his massive multi-volume work (the 1662 edn of the Port-Royal Logic in contrast contains 476 pages). As a rule, Régis removes the actual workings of logic-conversion of propositions, figures and modes of syllogisms, method of composition, etc.—and limits himself to the more theoretical parts. He paraphrases and abbreviates most of part I, preface, chs. 3-7 and 9-10 of Port-Royal. He continues with part II, ch. 1, breaking it up into two chapters, inserts ch. 5 on axioms from part IV, and proceeds with chs. 3-4, 10, 12, and 11 (in that order). Régis then moves to part III, preface, chs. 1–3 and 17. Part IV is more loosely indebted to Port-Royal. He ends his logic asserting: "Here is enough logic so as to understand physics, metaphysics, and ethics, which was the only end we proposed for ourselves in this work. Those who want a more particular knowledge of this part of philosophy can consult the book entitled The Art of Thinking. They would no doubt find there what would satisfy them: for we can certify that this work contains everything that ancient as well as modern authors have said that is best about logic, both speculative as well as practical." Régis 1691a, i. 62.

(21) Arnauld 1662, 27; Régis 1691a, i. 1; Le Grand 1972 [1694], i. 2, col. b.

(22) The Port-Royal term is "conceiving." However, Arnauld, Régis, and Le Grand are in agreement about the operation. Port-Royal asserts "we call *conceiving* the simple view we have of things presented to our mind ... and the form by which we represent these things to ourselves is called *idea*" (Arnauld 1662, 27). Régis echoes: "Perceptions are what we call in general ideas and we name ideas the simple view of things that present themselves to the soul without affirmation or negation" (Régis 1691a, i. 1). Le Grand affirms: "when we frame the *Species* of any thing by Thinking, the first view of our *Mind*, by which it represents and conceives the Thing as present, is called *Perception*, or in

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other words, *The first Operation of the Mind*, or *Simple Apprehension*." Le Grand 1972 [1694], i. 2, col. a.

(23) Arnauld 1662, 375.

(24) Arnauld 1662, 428-31.

(25) Régis 1691a, i. 48.

(26) Régis 1691a, i. 52–4.

(27) Régis 1691a, i. 56.

(28) Le Grand 1972 [1694], i. 5.

(29) Le Grand 1972 [1694], i. 6.

(30) Le Grand 1972 [1694], i. 7.

(31) Le Grand 1972 [1694], i. 8. The other rules are: "5. It avails much to the Clear and distinct perception of Truth, to retain in one's Mind an accurate Genealogy of Things and Modes, that with one cast of an Eye we may be able to take a view of the whole Universe of Things, beginning from the most General, and ending with the most Special," (p. 18); "6. The Idea or Perception of every thing is by so much the more clear and perfect, by how much the more Parts, Causes and Adjuncts of the thing it doth represent," (p. 22); "7. Those Things are to be looked upon as agreeing which agree in some common Idea or reason, or whereof the one is included in the Idea of the other; and they are said to disagree or to be diverse, which are the Objects of different Idea's and are apprehended after a diverse manner; or the one whereof is not included in the Idea of the other," (p. 22); "8. That Idea, or perception of a thing is clear and distinct, which represents the thing it self to the Mind, according to the foregoing Rules of Truth: And that obscure and confuse, which doth more of less depart from the same," (p. 23); "9. He whose Mind is furnished with most, and most perfect Ideas, is the most knowing and understanding Man," (p. 23); "10. The names of Things which we use in Philosophizing must be clear and determinate as to their Signification; not obscure or Ambiguous," (p. 25). See also Le Grand's six "Rules for New Beginners in PHILOSOPHY to observe, in order to the securing them from Error, and for the right conduct and guidance of their Reason," in the preface, sect. 3.

(32) Le Grand 1972 [1694], i. 17.

(33) Le Grand 1972 [1694], i. 45.

(34) Le Grand 1972 [1694], i. 46.

(35) Lesclache's "resolution" is just the Scholastic notion: breaking down a whole into its parts or knowledge into its first principles; "composition" is its opposite.

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(36) Lesclache's main claim to fame, however, rested on the many tables he published in the work and published again in Lesclache 1656.

(37) Anon 1650, 7-8.

(38) With the following note: "We have here omitted the Postulates of Descartes because in what follows we do not draw any conclusions from them. But we earnestly ask readers to read them through and to think them over carefully," Spinoza 2002, 128.

(39) Spinoza 2002, 177 and 189.

(40) See Spinoza 1964, 436, for the table of comparisons between Spinoza and Suárez, Martini, Burgersdijk, and Heereboord. See also Appuhn's notes on pp. 437–8 for further references to Heereboord.

(41) Spinoza 2002, 208.

(42) Du Roure 1654, i. 217–19. Cf. Descartes Principles, I, art. 48.

(43) Du Roure 1654, i. 219–20. Cf. Descartes *Principles*, I, arts. 51–2.

(44) Du Roure 1654, i. 220–5. Cf. Descartes Principles, I, arts. 53–68.

(45) Du Roure 1654, i. 225–7.

(46) Du Roure 1654, i. 228.

(47) Du Roure 1654, i. 228.

(48) AT iv. 444–5: "le mot de *principe* se peut prendre en divers sens, et que c'est autres chose de chercher une notion commune, qui soit si claire et si générale qu'elle puisse servir de principe pour prouver l'existence de tous les Êtres, les Entia, qu'on connaîtra par après; et autre chose de chercher un Être, l'existence duquel nous soit plus connue que celle d'aucun autre, en sorte qu'elle nous puisse servir de principe pour les connaître. Au premier sens, on peut dire que impossibile est idem simul esse et non esse est un principe, et qu'il peut généralement servir, non pas proprement à faire connaître l'existence d'aucune chose, mais seulement à faire que, lorsqu'on la connaît, on en confirme la vérité par un tel raisonnement: Il est impossible que ce qui est ne soit pas; or je connais que telle chose est; donc je connais qu'il est impossible qu'elle ne soit pas. Ce qui est de bien peu d'importance, et ne nous rend de rien plus savants. En l'autre sens, le premier principe est *que notre âme existe*, à cause qu'il n'y a rien dont l'existence nous soit plus notoire." These pronouncements of Descartes go well beyond the passage from the 1647 preface to the French edn of the *Principles* (which, as noted, Du Roure knows well and cites copiously): "ces principes doivent avoir deux conditions: l'une, qu'ils soient si clairs et si évidents que l'esprit humain ne puisse douter de leur vérité, lorsqu'il s'applique avec attention à les considérer; l'autre, que ce soit d'eux que dépende la connaissance des autres choses, en sorte qu'ils puissent être connus sans elles, mais non

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pas réciproquement elles sans eux," AT ixb. 2.

(49) Du Roure, *La Philosophie, Discours generaux sur la Philosophie*, 5; see also p. 4, concerning a low degree of wisdom, "which contains in the first place many notions that are very clear but that do not ordinarily allow us to discover the existence of another thing, such as it is impossible to be and not to be at the same time." Du Roure, *La Philosophie, La Physique*, 13, and the earlier *La Physique*, 7.

(50) Du Roure, *Abrégé, Métaphysique*, art. 89. It is possible that the passages from the *Discours generaux* and *Abrégé* were inspired only by Descartes' preface to the French edn of the *Principles*.

(51) Du Roure 1654, i. 257.

(52) Du Roure 1654, i. 258.

(53) Du Roure 1654, i. 300.

(54) The 1694 English edn of *The Institution*, contained in an *Entire Body of Philosophy*, is actually more than just a translation of the 3rd Latin edn, as the publisher Richard Blome indicates in his Epistle to the Reader: "And altho' this *Volume* of PHILOSOPHY has been so well received in *Latin* by the sale of several *Impressions*, yet for the making of it more exact and perfect, I contracted with the *Author* Mr. *Le Grand* to make *Additions* thereunto; so that by his large *Additions* and great *Alterations* throughout, it may be boldly said to be a *New Book*, and the best extant in any *Language*," Le Grand 1964; see also his *Proposal* for the printing of the work (Blome 1692). Subsequent Latin edns of the work do not incorporate the additions to the English edn.

(55) There are ten rules of truth dispersed throughout the first part of the Logick.

(56) Le Grand 1694, 8, col. a.

(57) Le Grand 1694, 9 col. a, b.

(58) Le Grand 1694, 9 col. b.

(59) Le Grand devotes chs. 4 and 5 to universals, ch. 6 to substance and its affections or modes, and ch. 7 to the common attributes of substance (by which he means duration, unity, truth, goodness, relation, opposition, and order). Ch. 8 concerns how the name of substance agrees with God and creatures, ch. 9 is about whole and part, causes and effects, subject and adjunct, and ch. 10 concerns distinctions: real, modal, and of reason. Le Grand also adds an appendix on a standard topic of the first part of logic, on the imposition, signification, definition, and use of names.

(60) See the previous section on logic for a sample of what Le Grand covers in these parts.

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(61) Le Grand 1694, 54, col. b.

(62) Le Grand 1694, 54, col. a. For Descartes' corresponding passage, see AT vii. 141.

(63) AT vii. 108. Descartes must have originally said "according to the rules of my logic," since he tells Mersenne: "In the place where I put 'in accordance with the laws of my logic,' please put 'in accordance with the laws of the true logic' … The reason why I add 'my' or 'the true' to 'logic' is that I have read theologians who follow the ordinary logic and inquire what God is before inquiring whether God exists." AT iii. 272–3.

(64) Le Grand 1694, 56, col. a. This is a new paragraph that occurs only in the English edn, though, of course, Le Grand discusses the general issue in part I of his *Logic*, 17, col. b, to 20, col. a.

(65) Le Grand 1694, 55, col. b.

(66) Le Grand 1694, 55, col. a. One of the reasons I think the paragraph is directed at Spinoza is that the paragraph does not exist in the first three edns (1671, 1672, 1675), but is first added to the 4th edn (1680), after the publication of Spinoza's *Ethics*, in his *Posthumous Works*, 1677.

(67) As Du Roure said, philosophers explain angels by analogy to humans and other created beings. So the study of angels can give us another entry into how philosophers think about humans; a comparison of the two sizeable treatments of angels during the seventeenth century, those of the Cartesian Le Grand and of the late Scholastic Dupleix, should be able to yield some interesting contrasts about how seventeenth-cent. philosophers think about angels, and thus, how they think about humans.

(68) The final chapter, in good "cartésianisme augustinisé" fashion, is on the conformity of St Augustine's opinions with those of Régis, about the nature of the mind and soul. See Gouhier 1978.

(69) Régis 1691a, *Métaphysique*, ch. 12, p. 144.

(70) This certainly looks different to what Descartes says in *Principles*, I, art. 10: "When I stated that this proposition *I think*, *therefore I am* is the first and most certain that presents itself to those who philosophize in an orderly fashion, I did not for all that deny that one must first know *what thought*, *existence and certainty are*, and that *in order to think we must exist*, and such like; but because these are such simple notions that of themselves give us no knowledge of anything that exists, I did not think them worthy of being enumerated."

(71) Régis 1691a, *Métaphysique*, 145–6.

(72) See Régis 1691a, *Metaphysics*, ch. 1, for the toning down of doubt. The *cogito* is represented as "I have a great number of items of knowledge; I know, for example, the heaven, the earth, the sea, etc., and I cannot doubt the existence of these items of

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knowledge when I separate them from their objects and consider them as simple perceptions by which I believe I know heaven, the earth, the sea, etc. Now, natural light teaches me that if I were nothing I could not have perceptions nor items of knowledge. It must therefore be that I am something and consequently that I exist," p. 58. See also my section on Cartesian physics in this chapter.

(73) Tad Schmaltz calls Desgabets and Régis "Radical Cartesians." Their three principal theses—the indefectibility of matter, realism about the representative contents of ideas, and a tight union of mind and body—undermined other Cartesian doctrines as well. As a result of the three theses, they abandoned the method of doubt, adopted fallibilism and a kind of empiricism, and reinterpreted the *cogito*; they rejected the proposition that the mind is better known than the body. See Schmaltz 2002.

(74) Régis 1691a, Métaphysique, 101.

(75) To Molanus, in Leibniz 1989, 242.

(76) Simon Foucher (1644-96) was educated by the Jesuits in Dijon, obtained a bachelor's in theology at the Sorbonne, and became a chaplain on Rue Saint-Denis. In Paris, he came into contact with Rohault and other Cartesians. He became a critic of Cartesian philosophy and a proponent of Academic skepticism, composing various defenses of Academic philosophy. He engaged in a polemic with Malebranche over the theory of ideas and Cartesian metaphysics and responded to Desgabet's reply to his critique of Malebranche. In his critique of Malebranche, Critique de la recherche de la vérité, Foucher proceeds as a skeptic, casting doubts on several of Malebranche's assertions, but also digging out the contradictions in Malebranche's dogmatic assumptions. Foucher divides his text with a series of what he believes are questionable suppositions and assertions. He protests that Malebranche asserts that the mind is a simple substance without parts and yet proceeds to explain that it has two distinct faculties of will and understanding. He accepts Malebranche's assertion that mysteries of the faith must be distinguished from the nature of things, but complains that Malebranche uses articles of faith as principles. He claims that brain traces are necessary for our memory of experiences of the external world, but that Malebranche does not allow for such brain traces in the understanding though he wants the understanding to be able to think about material things. Foucher argues that ideas cannot in essence be like extended things so that they cannot represent extended things, and that if ideas are not like the things that cause them, then we can know nothing about the way these things are in themselves. Finally he constructs puzzles about the claim that we know by the senses that there is extension outside us. The strongest argument in this section actually responds to Rohault's contention that we experience extended objects acting on us at different points, from which we deduce that they are extended. Foucher concludes that this serves to prove that there is extension in our soul; that is, that the essentially unextended mind is extended. As for Malebranche's doubtful assertions, they are: that the will, not the intellect, is what judges; that consent should be given to propositions only if the refusal of consent causes interior pain and secret reproaches from reason; that several probabilities joined together can constitute evident demonstrations; that

judgments from the senses are all false; that there may be beings that are neither bodies nor minds; and that we know the essence of the soul and of matter.

(77) Malebranche 1980, 15.

- (78) Watson and Grene 1995, 25.
- (79) Watson and Grene 1995, 25.
- (80) Desgabets 1985, Supplément II, ch. 12, sect. 7, p. 271.
- (81) As I have suggested, Du Roure maintains the ambiguity and adds little to the debate.
- (82) Le Grand 1694, 17, col. b.
- (83) Le Grand 1694, 17, col. b.
- (84) Le Grand 1694, 18, col. a.
- (85) Le Grand 1694, 18, col. a.
- (86) Le Grand 1694, 18, col. a.

(87) Le Grand 1694, 18, col. a. "S. Denys" in Le Grand's text refers to Pseudo-Dionysius and his work, *On the Divine Names*. It may not be an accident that Le Grand refers to Pseudo-Dionysius' work; after all, in the title to *Principles*, part I, art. 51, Descartes refers to substance as a name (*nomen; nom*) that cannot be attributed to God and creatures in the same sense, repeating in the text that the name (*nomen; nom*) substance is not univocal with respect to God and creatures.

(88) Régis 1691a, Métaphysique, 88.

(89) Régis 1691a, Métaphysique, 89.

(90) Régis 1691a, *Métaphysique*, 92. According to Tad Schmaltz, "By the time of the *Use of Reason*, Regis settled on the view that since God is related only in an equivocal manner to created substances, He is not properly taken to be a substance," Schmaltz 2000, 108.

(91) Du Roure 1654, i. 221–2; Le Grand 1694, 22, col. a.

(92) Du Roure 1654, i. 221–2. See also Le Grand 1694, 22, col. b.

- (93) Le Grand 1694, 22, col. b.
- (94) Du Roure 1654, i. 222.
- (95) Le Grand 1694, 23, col. a.
- (96) Régis 1691a, *Métaphysique*, 116.

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(97) Du Roure 1654, *La Physique*, 8–10. Those holding this view, according to Du Roure, include the most excellent philosophers of antiquity, perhaps the Schoolmen of his time, plus Democritus, Lucretius, Hobbes, and even Aristotle.

(98) Du Roure 1665, *Physique*, arts. 24–5.

(99) See Le Grand 1694, *Logick*, 1, chs. 4 and 5, pp. 10, col. b–14, col. a, and Régis 1691a, *La Logique*, ch. 4, pp. 10–12.

(100) Le Grand 1694, *Physick*, 98, col. b.

(101) Cordemoy 1666, First Discourse, 1–26, esp. pp. 11–12.

(102) Leibniz 1923–, vi/4. 1799; also Leibniz 2001, 279.

(103) Leibniz 1923–, vi/3. 491; also Leibniz 1992, 51–3.

(104) Leibniz 1923–, vi/4. 1541.

(105) It might look as if Leibniz was simply generalizing on Descartes' position, emphasizing just one aspect of Descartes' two tiers, i.e. extending Descartes' view of the human body to all creatures. That might be right, but Leibniz's view of individuation as rooted in substantial form and universal to all creatures was stated initially in a 1668 treatise on transubstantiation, when his knowledge of Descartes was very limited; and, as we have said, the *Letters to Mesland* on the Eucharist, in which Descartes was most explicit about the two-tiered view, was not available until the nineteenth cent. This could easily be a case of accidental convergence.

(106) E.g. Du Roure 1654, *La Théologie naturelle*, 250; Le Grand 1694, 56, col. a; Régis 1691a, *La Métaphysique*, 83.

(107) Du Roure 1654, 258; Le Grand 1694, 58, col. a-59, col. a.

(108) Le Grand 1694, 59, col. a. These two paragraphs occur only in the 1694 English edn.

(109) Régis 1691a, 231–46.

(110) Discours sur la Philosophie in Régis 1691a, i, unpaginated.

(111) Cordemoy 1666, 22. See also Mouy 1934, 103.

(112) I am quoting from Clarke's translation, *Rohault's System of Natural Philosophy* (Rohault 1739), 29–30. Unlike Le Grand and Régis, who tried to publish complete "systems" of Cartesian philosophy, Rohault limited himself to natural philosophy. He was the foremost proponent of Cartesian physics in the decades immediately following the death of Descartes. In the mid-1650s he began to hold weekly lectures at his house in Paris; these "mercredis de Rohault" brought him to the attention of prominent

Cartesians. He became Régis' teacher and won him over to the cause of Cartesianism. Rohault was best known for his 1671 *Traité de physique*, which went through numerous editions and remained a standard textbook in Cartesian natural philosophy well into the eighteenth cent., long after Rohault's death in 1672. The *Traité de physique* was initially translated into Latin in 1682 and then again, with annotations, by Samuel Clarke, in 1697. Clarke's Latin edn was translated into English in 1723 by his younger brother John and published as *Rohault's System of Natural Philosophy*. As the work went through multiple editions, Clarke increasingly "illustrated" it with "notes taken mostly out of Sr. Isaac Newton's Philosophy." His first footnote on vacuum, affirming the vacuum, takes almost all of p. 27 in two small columns.

(113) Rohault 1739, 28.

(114) Le Grand 1972 [1694], 113, col. a. See also Du Roure 1654, i. 70–2, for similar defenses.

(115) Le Grand 1972 [1694], 113, col. a, b.

(116) Le Grand 1972 [1694], 113, col. b.

(117) Régis 1691a, i. 285.

(118) On questions of place, the Cartesians, especially Rohault and Le Grand, represent Descartes very well; they define internal and external place and are careful to indicate that the surface to which they are referring with respect to external place is the "common surface." Rohault 1739, 28; Le Grand 1972 [1694], 112–13. Régis, on the other hand, makes short work of internal and external place and does not mention the common surface; Régis 1691a, 287–8.

(119) Régis 1691a, i. 281–2.

(120) Régis 1691a, 288–9.

(121) Régis 1691a, 289. Régis invokes the distinction between God's extraordinary and ordinary powers a number of times in his *Reply to Huet*. For example, when Huet says that it is a maxim of Descartes that God can make two and two not add up to four, Régis denies that it is a maxim of Descartes, adding, "or if God can can do that, it is only by his absolute power, which is not what is at stake here, where it is only a question of what depends on God's ordinary power, that within which philosophers are required to limit themselves." Régis 1691b, 92.

(122) Huet 1690, 149–50; Huet 2003, 182–3.

(123) Régis 1691b, 277-8.

(124) Unpaginated preface; Rohault 1739, 11–13.

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(125) Du Roure expresses a similar sentiment in his *Philosophie*, Logique, 1954, i. 188.

(126) Régis 1691a, unpaginated preface.

(127) See Roger Ariew, "Censorship, Condemnations, and the Spread of Cartesianism," and Mihnea Dobre, "Rohault's Cartesian Physics," in Dobre and Nyden 2013, 25–46.

(128) Le Grand 1972 [1694], i. 91.

(129) Le Grand 1972 [1694], i. 92.

(130) Le Grand 1972 [1694], i. 92.

(131) Le Grand 1972 [1694], i. 92.

(132) Régis 1691a, 64. Régis continues: "Metaphysics not only serves as foundation for all natural Sciences, it is yet more simple and easier to acquire than all of them; the mind's access to this science is common to all kinds of native intelligences, because there is nothing in life or in the society of mean which does not dispose or lead itself to it. Every occasion all needs contribute incessantly to the material of Metaphysics which concerns the knowledge of the soul and we experience in ourselves all the proofs of the things that are the object of this knowledge. In contrast, with the other sciences we are required to go out from ourselves in order to consider the objects we examine. For example, we go out from ourselves in Geometry in order to contemplate shapes, we go out from ourselves in Physics to consider motions, and we go out from ourselves in Morals in order to observe the conduct of other men."

(133) The empirical hypothetico-deductive nature of Cartesian science is well established.
See Mouy 1934, esp. 147, 165–6, concerning Régis. See also Clarke 1989 and Ariew
2006; for Jacques Rohault's empiricism, see Dobre, in Dobre and Nyden 2013, 203–26.

(134) Huet 1689, ch. 1, art. 14: "Hi enim et ille [Cartesius et Scepticorum] viderunt esse dubitandum; at dubitare ille tum desiit, cum erat maxime dubitandum; in hoc videlicet principio, quod minus incertum est ac reliqua omnia quibus adductus erat ad dubitandum; hi dubitare pergunt in eodem illo principio, de quo vel maximue dubitandum esse vident: hautquaquam certe dubitantes ut dubitent; quod ipsis minime insimulasset Cartesius, si rationes eorum diligentius perspexisset; sed ideo dubitantes, quod nihil ipsius satis liquido, satisve certo percipi posse videatur." This is basically in agreement with Duhamel's position.

(135) Régis 1691b, i, art. 5.

(136) Régis 1691b, i, art. 1. Although Régis uses the word *hyperbolic* to describe Descartes' methodological doubt, it is clear that his notion of doubt is radically different from that of Descartes.

(137) Régis 1691b, i, art. 6: "Or qui le peut empêcher, quand il les a examinées, de les

tenir pour vrayes, si elles lui ont paru telles?"

(138) Among Du Roure's bona fides for being a Cartesian is the fact that he knows the Cartesian texts very well and that he is acquainted with a number of Descartes' letters before their publication in Clerselier's edn of Descartes' correspondence (see Ariew 2012). Du Roure also met the Cartesian Johann Clauberg when the latter was in Paris and ultimately published a work in Clauberg's compilation of Cartesian papers in Dutch translation: *Cartesiaanse reden-konst: met het onderscheid tusschen de Cartesiaanse en schoolse philosophie* (Amsterdam, 1683).

(139) Du Roure 1665, Discours General, Les Sciences, nos. 7–8: "7. Il y a trois sortes d'Evidence. L'une Morale, quand le contraire n'arrive pas ordinairement. L'autre Physique, quand le contraire n'arrive iamais. La derniere Metaphysique, ou Absoluë, quand le contraire ne peut arriver. 8. De ces trois Propositions: cet homme mourra devant cent ans, il mourra, il peut mourir: La premiére est certaine et évidente Moralement, la deuxiéme Physiquement, la derniére Absolument." Even Du Roure's example of absolute certainty, "this man can die," seems less than absolute.

(140) Du Roure 1665, Logique, sect. 20: "Toutes nos connoissances viennent de l'experience. ... Et quiconque fait plus de raisonnemens que d'experiences ou de reflexions sur elles, tombe souvent dans l'erreur."

(141) Huygens 1690, preface, 2–3: "On y verra de ces sortes de demonstrations, qui ne produisent pas une certitude aussi grande que celles de Geometrie, et qui mesme en different beaucoup, puisque au lieu que les Geometres prouvent leurs Propositions par des Principes certains et incontestables, icy les Principes se verifient par les conclusions qu'on en tire; la nature des choses ne siuffrant pas que cela se fasse autrement. Il est possible toutefois d'y arriver à un degré de vraisemblance, qui bien souvent ne cede guere à une evidence entiere. Sçavoir lors que les choses, qu'on a demontrées par ces Principes supposez, se raportent parfaitement aux phenomenes que l'experience a fait remarquer; sur tout quant il y a un grand nombre, et encore principalement quand on se forme et prevoit des phenomenes nouveaux, qui doivent suivre des hypotheses qu'on employe, et qu'on trouve qu'en cela l'effect repond à notre attente. Que si toutes ces preuves de la vraisemblance se rencontrent dans ce que je me suis proposé de traiter, comme il me semblent qu'elles sont, ce doit estre une bien grande conformation du succes de ma recherche, et il se peut malaisement que les choses ne soient à peut pres comme je les represente."

(142) The status of Huygens as a Cartesian is rightly disputed. Some see him as greatly influenced by Descartes (see e.g. Dugas 1953, 1954); others reject him completely as a Cartesian (see e.g. Fabien Chareix in Foisneau 2008, i. 613–18). What is clear is that Huygens met Descartes as a child and that Descartes is usually in his thoughts when thinking about science; he is forever criticizing Descartes, adjusting his views, etc. This is evident in the *Treatise on Light* (published on 1690, but finished much earlier, in 1678, as Huygens states in the preface to the work). Perhaps Huygens ultimately became a vacuuist, but the *Treatise on Light* defends a wave theory of light and a vortex theory of

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gravitation. It is resolutely mechanist. Its ch. 1 emphasizes that "the true philosophy" is the one "in which we conceive the cause of all natural effects by reasons of mechanics"; he adds, "we must do this in my opinion, or truly renounce all hope of ever understanding anything in physics" (Huygens 1690, 3). That chapter mentions Descartes by name three times, all of them both approvingly and critically. Huygens talks about his going beyond Descartes in his theory in which one will find more than "the ellipses, hyperboles, and other curved lines subtly invented for this effect by Mr. Descartes" (p. 2); he proposes an extension in the experiment described by Descartes (in a letter of 22 Aug. 1634) for measuring the speed of light by means of a lunar eclipse, i.e. Romer's experiment with the moons of Jupiter. Descartes' proposed experiment using the lunar eclipse is appreciated by Huygens, who calls it a better experiment than the one to be performed on earth with lanterns at great distances (proposed by Galileo and Beeckman). Huygens even asserts: "It has always seemed to me, and to many others with me, that even Mr. Descartes, who had as aim to treat intelligibly all subjects of physics, and who assuredly succeeded in this much better than anyone before him, did not say anything that is not full of difficulties, or even inconceivable, in what concerns light and its properties" (pp. 6–7). This extremely respectful treatment of Descartes, this attempt to use him and to go beyond him, certainly qualifies Huygens as a Cartesian, though perhaps an unorthox one, at least in the *Treatise on Light*; it would have permitted others at the time to see him as a Cartesian and would have caused him some difficulties if he had been teaching in France (as opposed to being a member of the Académie des Sciences).

(143) One issue I discussed in Chapter 2, in the section on physics, under the rubric "Inanimate Natural Body," is the issue of the new telescopic observations of the heavens, concerning such phenomena as sunspots and comets. This issue is of some importance, but I will limit myself to these brief comments. Descartes rejected the Scholastic account of the elements differentiated qualitatively. His account postulated three elements differentiated quantitatively, i.e. by size, shape, and speed. Thus, he also rejected the heterogeneity of the sublunar and supralunar regions, and the view that aether or quintessence constituted the supralunar region or the heavens. In Principles, III, Descartes accounts for sunspots with an analogy of scum bubbling up to the surface of a liquid. Novas are then stars whose sunspots become so dense as to be concealed from our view; planets (such as the earth) and comets are stars whose spots have hardened into a crust—the latter moving with high speed and the former slowly, thus remaining at a fixed distance from the center of its vortex. The Cartesians all discuss comets in a section just after the one on the fixed stars and sunspots, and before their discussion of meteors (see e.g. Du Roure 1654, 184–5). Le Grand's chapter on comets, also following his chapter on sunspots, allows for two kinds of comets, the sublunary comets, which he calls "Bastard Comets," and "True Comets or Wandering Stars." Le Grand, following Descartes, concludes: "A Comet therefore is Wandring Star, compos'd of the Matter of the Third Element, which because of its solidity and great agitation passeth from one Vortex to another." Le Grand 1972 [1694], 162, col. b–163, col. a. The same definition is given in Régis 1691a, i. 420. Rohault discusses these issues in ch. 25 (Of the Nature of the Stars) and ch. 26 (Of Comets) of his *Physics*. He represents Descartes very well and

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adds considerable empirical findings of his own. Needless to say, these chapters were most heavily annotated by Samuel Clarke, representing the Newtonians (the footnote on comets running two pages in small font and double columns). The Cartesians were in many respects in agreement with such Scholastics as Fromondus against Galileo about comets, though their respective cosmologies were radically different. Questions about comets were basically undecidable during the first half of the seventeenth cent., but gradually less so during the second half.

(144) Du Roure 1654, 1665.

(145) Du Roure 1654, ii. 283–4.

(146) For Gassendi, see Du Roure 1654, ii. 314–17; for Descartes, pp. 317–20.

(147) I.e. Clerselier's fourth letter from vol. i: AT iv. 264–6.

(148) Du Roure, *La Philosophie*, ii. 317. Descartes: "la béatitude consiste, ce me semble, en un parfait contentement d'esprit et une satisfaction intérieure," AT iv. 264.

(149) "There is a difference between beatitude and what one calls being happy. For the latter of these things depends absolutely on fortune, as one can even see it by this common manner of speaking: one is sometimes more happy than wise," Du Roure 1654, ii. 318. Descartes: "il y a de la différence entre l'heur et la béatitude, en ce que l'heur ne dépend que des choses qui sont hors de nous, d'où vient que ceux-là sont estimés plus heureux que sages." As for external things being equated with fortune, Descartes also says: "quelles sont les choses qui nous peuvent donner ce souverain contentement, je remarque qu'il y en a de deux sortes: à savoir, de celles qui dépendent de nous, comme la vertu et la sagesse, et de celles qui n'en dépendent point, comme les honneurs, les richesses et la santé," AT iv. 264.

(150) "The poor even, and generally all those fortune does not favor, can be extremely satisfied. In effect, a small vessel can be as filled as another, larger one, even though it contains less," Du Roure, 1654, ii. 318. Descartes: "Car il est certain qu'un ... pauvre, malsain et contrefait, peut jouir d'un plus parfait contentement ... Toutefois, comme un petit vaisseau peut être aussi plein qu'un plus grand, encore qu'il contienne moins de liqueur." AT iv. 264.

(151) "I. Try always to use one's mind, as well as it is possible, to know what one should and should not do in all occurrences of life," Du Roure, 1654, ii. 319. Descartes: "La première est, qu'il tâche toujours de se servir, le mieux qu'il lui est possible, de son esprit, pour connaître ce qu'il doit faire ou ne pas faire en toutes les occurrences de la vie," AT iv. 265.

(152) "II. Have a constant resolution to execute that which reason wants (*veut*) without our passions or our appetites diverting us from it. And it is the firmness of this resolution that Descartes takes for virtue," Du Roure 1654, ii. 319. Descartes: "La seconde, qu'il ait une ferme et constant résolution d'exécuter tout ce que la raison lui conseillera, sans que

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ses passions ou ses appétits l'en détournent; et c'est la fermeté de cette résolution, que je crois devoir être prise pour la vertu," AT iv. 265.

(153) "III. Consider that while we conduct ourselves in this manner as well as we can according to reason, the goods that we do not possess are outside our power," Du Roure 1654, ii. 319. Descartes: "La troisième, qu'il considère que, pendant qu'il se conduit ainsi, autant qu'il peut, selon la raison, tous les biens qu'il ne possède point sont aussi entièrement hors de son pouvoir les uns que les autres," AT iv. 265.

(154) As I indicated in the section on metaphysics and elsewhere, Du Roure had access to at least some of Descartes' correspondence; see also Ariew, in Foisneau 2008, 414, and Ariew 2012.

(155) Also prior to its publication in Clerselier, as Clerselier letter 112 (AT iii. 378–82). Du Roure refers to it as something that can be found in "Descartes' posthumous works." This is the French version of the Latin letter to Mesland of 9 Feb. 1645, AT iv. 173–5. Du Roure's exposition is in 1654, ii. 340–4. In the chapter on virtues, Du Roure details the standard (Aristotelian) definition of moral virtue as an elective habit, accompanied by council, consisting in the mean (pp. 356–7). He adds that "Hobbes, whose arguments many admire today, mocks this virtuous medium and assures us that the philosophers making use of it construct an ethics full of contradictions. … Hobbes' opinion is that an action is not virtuous because it falls in the middle, but because it is commanded by right reason as a means for self-preservation and for the preservation of the peace," (pp. 362–3).

(156) Du Roure, La Philosophie, ii. 341.

(157) Du Roure, *La Philosophie*, ii. 341–4. Cf. AT iii. 378–81 and iv. 172–5. The fact that Du Roure utilizes passages from the letter to Elisabeth on the supreme good and from the letters on freedom (Mersenne/Mesland) was indicated by Geneviève Rodis-Lewis in her "Der Cartesianismus in Frankreich," *Grundriss der Geschichte der Philosophie* (1993), *17 Jh*. 2/1. 401: "Die Moral schliesslich ist von mehreren cartesischen Briefen beeinflusst, die erst 1657 (vier Jahre nach dem Druckprivileg der 'Philosophie' vom 19. Mai 1653) in Band 1 der von Clerselier besorgten Briefausgabe erschienen sind: verschiedene Auffassungen über das höchste Gut bei den Alten, Zufriedenheit und Freiheit, oberster Wert – nach den Briefen an Elisabeth, Christine, Mersenne und Denis Mesland." I owe this reference to Vlad Alexandrescu. Rodis-Lewis was right, of course, that Du Roure was aware of the letters from Elisabeth and Mersenne/Mesland. There was no mention in Du Roure of any letter to Christina. Of course, Du Roure might have known the contents of the letter to Christina of 20 Nov. 1647 on the supreme good (AT v. 82–5), since it is basically a reporting of the prior letters to Elisabeth on the same subject.

(158) Du Roure 1654, ii. 415–55 (from Descartes' published Passions of the Soul).

(159) Du Roure 1654, ii. 458. See Malcolm 2002, 500-1.

(160) We've already indicated that Descartes argues that we should choose the interest of the whole of which we are a part over our own self-interest. In this he disagrees with Hobbes. Descartes realized this, since he happened to have read Hobbes' *De cive* in 1643. Descartes wrote to Mersenne: "All I can say about the book *De cive* is that I judge the author to be the same person who wrote the *Third Objections* against my *Meditations* and that I find him more capable in moral philosophy than in metaphysics or in physics. Not that I can in any way approve his principles or his maxims, which are extremely bad and very dangerous, in that he supposes all persons to be wicked, or that he gives them cause to be so. His whole aim is to write in favor of the monarchy, which could be done more advantageously and more solidly than he has accomplished by adopting maxims that are more virtuous and more solid." AT iv. 67.

(161) [Ameline] 2009 [1687].

(162) [Ameline] 2009 [1687], 67.

- (163) [Ameline] 2009 [1687], 73.
- (164) Le Grand 1671, 1672 [1678, 1680], and 1972 [1694].

(165) Le Grand 1972 [1694], 347, col. b.

(166) Mautner 2000. Mautner's article contains a very nice analysis of the changes in the contents of Le Grand's various edns.

(167) Le Grand 1972 [1694], 348, col. b.

(168) Le Grand 1972 [1694], 348, col. b.

(169) Le Grand 1972 [1694], 356, col. b.

(170) A similar move seems to be made by Malebranche, who in various works tries to establish ethics as an a priori science directly on metaphysics, bypassing physics. See Bardout 2000.

(171) In his extremely popular 1672 treatise, *On the Duty of Man (De officio hominis et civis juxta legem naturalem)*, Pufendorf divides duty into three, natural, civil, and Christian: "Therefore it is manifest that from three founts, so to speak, men derive the knowledge of their duty and what in this life they must do, as being morally good, and what not to do, as being morally bad: namely the light of reason, the civil laws and the particular revelation of the divine authority. From the first flow the commonest duties of man, especially those which make him sociable with other men; from the second, the duties of man in so far as he lives subject to a particular and definite State; from the third, the duties of a man who is a Christian. From this three separate studies arise, the first of which is the natural law, common to all nations; the second, the civil law of the single individual States, into which the human race departed. The third is called moral theology in contradistinction to that part of theology which explains what is to be believed [that is,

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dogmatic theology]." Pufendorf, Preface to the benevolent Reader, 1927. I owe this reference to Pufendorf to my colleague, Colin Heydt.

(172) Régis 1691a, Morale, ch. 3, pp. 489-91.

(173) Régis 1691a Morale, ch. 3, p. 489.

(174) Régis 1691a, *Morale*, ch. 3, p. 489.

(175) Régis 1691a, Morale, ch. 3, p. 490.

(176) Régis 1691a, Morale, ch. 3, p. 396.

(177) Régis 1691a, Morale, ch. 3, p. 397.

(178) Régis 1691a, Morale, ch. 3, p. 398.

(179) "Naturalistic" in the sense that it does not refer to revealed truth, but is founded only on what reason can reveal to us, though, of course, it is subalternated to Cartesian physics and metaphysics, which are also allegedly founded on what reason can reveal to us apart from faith.



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Descartes and the First Cartesians

Roger Ariew

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A Brief Conclusion

Roger Ariew

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[-] Abstract and Keywords

The Cartesians ultimately were able to replace the Aristotelians in the Schools. This concluding chapter asks how they accomplished this. It answers that the Cartesians supplanted the Aristotelians by producing Cartesian textbooks that can be used teach the whole collegiate curriculum, logic, metaphysics and natural theology, physics, and ethics, in a Cartesian mode. The Cartesians attempted a revolution across all aspects of the curriculum, not just in the sciences and metaphysics. Cartesianism, it could be said, tried to transform *everything*. This is especially evident when Cartesian textbooks from the second half of the seventeenth century are contrasted with Scholastic textbooks from the first half of the seventeenth century: the many of the distortions provoked by Descartes in the middle of the century become clearer, whether they are with respect to hylomorphic metaphysics, scientific methodology, or the construction of what could be called a Neo-Stoic ethics or a Neo-Scholastic logic.

Keywords: Neo-Scholastic logic, Cartesian metaphysics and natural theology, Cartesian physics, Neo-Stoic ethics

This volume began by recalling Louis XIV's 1671 edict against the teaching of Descartes' philosophy. The King was concerned that those who taught the philosophy of Descartes could bring disorder to the state because of their alternative explanations about the mysteries of the Catholic faith. Cartesianism was perceived as a threat because it sought to supplant Scholasticism and because any change of philosophical doctrine might in itself be destabilizing. And if Cartesianism could get a foothold in the Schools, the higher faculties of theology, medicine, and law, which depended on students having been taught Scholastic philosophy and its terms, might be damaged as well. Unlike the present time, with our new-and-improved mantra, novelty and innovation were then seen in a negative light.

We might not think ill of innovators, but in the seventeenth century the Latin term *novatore* and its cognates in other languages were terms of disapprobation.¹ One can find dozens of books in the first half of the century whose titles include the term, all of them contra or adversus Novatores.² This attitude is enshrined in the first edition of the Dictionnaire de l'Académie française (1694) which defines novateur as "Celuy qui introduit quelque nouveauté, quelque dogme contraire aux sentimens & à la pratique de l'Eglise » (whoever introduces some dogma contrary to the sentiments and practice of the Church)" and gives as the sole example of the term: "Les Novateurs sont dangereux (Innovators are dangerous)." The pejorative sense of "novateur" continues well into the 6th edition of the Dictionnaire (1875). The domain of the term is also gradually broadened to include those who introduce some novelty into philosophy: "Depuis le comencement du siècle on a comencé à l'employer pour les matières profanes" (Since the beginning of the century it has begun to be used for profane matters), and then, "Il se dit quelquefois de ceux qui veulent innover dans quelque matière que ce soit" (It is sometimes said of those who wish to innovate in any matter whatsoever). More generally, novateur becomes "Dérangé, [il] signifie désorienté: suivant les Novateurs (Deranged, it means disoriented: following the innovators)." The Dictionnaire Littré (p.202) (1872–7) cites some interesting historical uses of the term, including this one from Malebranche: "Ils appellent indifféremment du nom odieux de novateur les hérétiques et les nouveaux philosophes" (They call heretics and new philosophers indiscriminately by the odious name of innovator).³

We can see such sentiments expressed even by some in Descartes' circle, when giving various lists of *novatores*.⁴ Descartes himself uses the term in a negative fashion. In a nasty letter to Isaac Beeckman about whether Beeckman had gotten too familiar in his tone with him, treating himself as Descartes' teacher and Descartes as a mere schoolboy, Descartes reflected on the kind of things someone can teach another, which are: "languages, history, experiments, also certain and evident demonstrations that convince the mind, such as those of the Geometers." But, Descartes said, "the maxims and opinions of the philosophers cannot be taught: to repeat them is not to teach them." At this point Descartes asserted: "Plato says one thing, Aristotle another, Epicurus another, Telesio, Campanella, Bruno, Basso, Vanini, and all the *novatores* all say something

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different. Of all these people, I ask you, who is it who has anything to teach me, or indeed anyone who loves wisdom?"⁵ Now, like other aspects of his letter, the words Descartes used were not exactly pleasant and perhaps they were not sincere. Clearly, Descartes wanted to suggest that his near predecessors and contemporaries—the *novatores*—held a great variety of philosophical opinions, but he also was referring to them⁶ with a derogatory term. The list of *novatores* changed over time to include even Descartes and Gassendi,⁷ but the sentiment was clear: These are dangerous people, heretics or near heretics, the heresy stemming from their attacks on Scholasticism and hence, in general, against authority and the faith.

I have also indicated that the Cartesians did not take the King's edict very well, responding with a burlesque of the *arret* to which it referred. In his *Journal* about the events at the College of Angers following the King's edict, François Babin, Professor of Theology and financial administrator at Angers, reproduced the Cartesians' *arret burlesque* and prefaced it with the following remark: "We provide this piece here to show that the innovators use all their wit and industry in order to evade and translate into ridicule the powers that fight against them; and that they do not fail to use mockery, caricatures, or jokes to validate their decried opinions, wishing by that means to dazzle the common minds by the effect of a false light and to persuade the rabble that reason, truth, knowledge, and good sense are theirs alone."⁸ The Cartesians did seem to be full of zeal, like the partisans of an intellectual revolution. Babin was clearly horrified by **(p.203)** the attitudes of the Cartesian professors and their students; his description of their behavior can provide a glimpse of the passions in play:

Young people are no longer taught anything other than to rid themselves of their childhood prejudices and to doubt all things, including whether they themselves exist in the world. They are taught that the soul is a substance whose essence is always to think; that children think from the time they are in their mothers' bellies, and that when they grow up they have less need of teachers who would teach them what they have never known than of coaches who would have them recall in their minds the ancient ideas of all things, which were created with them. It is no longer fashionable to believe that fire is hot, that marble is hard, that animate bodies sense pain. These truths are too ancient for those who love novelty. Some of them assert that animals are only machines and puppets without motion, without life, and without sensation, and that there are no substantial forms other than rational soul.⁹

For Babin, the Cartesian professors had corrupted their students, affecting everything from philosophy to theology, and ultimately the political sphere:

The Cartesians assert that accidents are not really distinct from substance; that it would be well to guard oneself from attributing some knowledge or certainty to the testimony of our senses. ... They make the essence of all bodies consist in local extension, without worrying that Christ's body does not better accommodate their principles and our mysteries; they teach that something does not stop being true in philosophy even though faith and the Catholic religion teach us the contrary—as if

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the Christian and the philosopher could have been two distinct things. Their boldness is so criminal that it attacks God's power, enclosing him within the limits and the sphere of things he has made, as if creating from nothing would have exhausted his omnipotence. Their doctrine is yet more harmful to sovereigns and monarchs, and tends toward the reversal of the political and civil state.¹⁰

Given this atmosphere—the spate of condemnations and resultant censorship—it might even have been surprising that the Cartesians, having lost many battles, ultimately won the war. As L. W. B. Brockliss said, "Although it is possible to encounter Aristotelian physics courses as late as the second decade of the eighteenth century, the attempt to reconcile Thomism and the new science was increasingly abandoned after 1690 in favour of a physics completely based on mechanist principles."¹¹ The 1690s was the time of the Cartesians' ascendency: Régis published his Systeme general in 1691 and Le Grand his Entire Body of Philosophy in 1694. Pourchot issued his multi-volume textbook Institutiones philosophicae in 1695, with other editions from 1700 to 1755. In fact, Pourchot was named Professor of Philosophy at the University of Paris in 1677, and taught there for twenty-six years, despite the 1691 requirement for all professors in Paris to sign a royal anti-Cartesian formulary.¹² It does look like the formulary and (p.204) the Jesuit condemnation of Cartesianism in 1705 were rearguard actions, final gasps of anti-Cartesianism. Brockliss also says: "in most cases the fundamentals of Cartesian physics had been definitely accepted by 1720. Significantly, in that very year it was suggested that Cartesian mechanism be adopted as the approved physical philosophy at the University of Paris."¹³

The victory of Cartesianism over Scholasticism was so complete that, by 1734, Voltaire, writing about his experiences in England in his letter "On Descartes and Sir Isaac Newton," could notoriously report: "A Frenchman, who arrives in *London*, will find philosophy, like everything else, very much changed there. He had left the world a *plenum*, and he now finds it a *vacuum*. At *Paris* the universe is seen composed of vortices of subtile matter; but nothing like it is seen in *London*. In *France* it is the pressure of the moon that causes the tides; but in *England* it is the sea that gravitates toward the moon."¹⁴ Voltaire continued his letter describing other contrasts and ended it by praising Newton most highly; he subsequently wrote letters about Newton's universal attraction, his theory of optics, and his views on infinity and chronology. What was clear in Voltaire's account was its description of Paris as a Cartesian stronghold and of London as a Newtonian one; Voltaire wanted to rectify the situation in favor of Newton. What was also clear was that battles were no longer being waged between Cartesians and Scholastics. The Scholastics had dropped out of the contest.

More than a century after Voltaire, when Pierre Duhem was arguing for his view of physical theory, he still considered his options as Cartesians versus Newtonians. This time, the issues were not metaphysical and cosmological, but methodological, and Duhem assimilated the Cartesians with the atomists (as has often been done before), but the positions he described as Cartesian were still recognizable as such (cf. *Principles*, iv, art. 200–1):

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Theoretical physics may be treated in the fashion of Cartesians and Atomists. They resolve the bodies perceived by the senses and instruments into immensely numerous and much smaller bodies of which reason alone has knowledge. Observable motions are regarded as the combined **(p.205)** effects of the imperceptible motions of these little bodies. These little bodies are assigned shapes which are few in number and well defined. Their motions are given by very simple and entirely general laws. These bodies and these motions are, strictly speaking, the only real bodies and the only real motions. When they have been suitably combined, and recognized as together capable of producing effects equivalent to the phenomena we observe, it is claimed that the explanation of these phenomena has been discovered. ... Alternatively, theoretical physics may be conceived in the manner of Newtonians. They reject all hypotheses about imperceptible bodies and hidden motions, of which the bodies and motions accessible to the senses and instruments may be composed. The only principles admitted are very general laws known through induction, based on the observation of facts.¹⁵

Duhem criticized both the Cartesians and the Newtonians: the method of the Cartesians for not being autonomous and that of the Newtonians for being impractical. He defended the method of Energetics as his preferred physical theory. But, again, the views of Scholastics—this time on the method of science—were not in play.

Descartes and the Cartesians constructed whole philosophical systems they considered to be in opposition to those of the Scholastics. Most of the philosophers in the next generation saw themselves as philosophizing with both Scholastic and Cartesian doctrines among their choices, together with other possibilities such as Gassendi's neo-Epicureanism. Ultimately, in the third or fourth generation, philosophy was done in the background of debates between rationalists and empiricists, with Descartes, Locke, and Hume in mind; the principal opposition in natural philosophy was thought to be between the (rationalist) Cartesians and the (empiricist) Newtonians. When Immanuel Kant was considering his philosophical options, his universe consisted mainly of the philosophies of Leibniz, Newton, Descartes, and Hume; when he referred to "School metaphysics," the Scholastic philosophy he was thinking of was not that of the Aristotelians, but that of Christian Wolff. (An attempt to reestablish Scholastic metaphysics, in the form of neo-Thomism, was attempted by the Catholic Church at the end of the nineteenth, beginning of the twentieth century, but it neither succeeded very well nor lasted very long.)

Thus the Cartesians were able to replace the Aristotelians in the Schools. How exactly did they accomplish this? Well, they tried to supplant the Aristotelians by producing Cartesian textbooks that would teach the whole collegiate curriculum, logic, metaphysics and natural theology, physics, and ethics, in a Cartesian mode. They attempted a revolution across all aspects of the curriculum, not just in the sciences and metaphysics. We should all be comfortable with the thought that Descartes wrought a revolution in philosophy, by which we mean one in the physical sciences and in the metaphysical principles accompanying them. After all, it was Descartes who said that the *Meditations* destroy the principles of Aristotle's physics.¹⁶ And we can see that most debates of the latter half of

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the seventeenth century were centered on these topics.¹⁷ But we are not usually attuned to the other attempted Cartesian revolutions, those **(p.206)** endeavored in ethics and logic, for example. Cartesianism, it could be said, tried to transform *everything*. This is especially evident when Cartesian textbooks from the second half of the seventeenth century are contrasted with scholastic textbooks from the first half of the seventeenth century; we are then made aware of many of the distortions caused by Descartes in the middle of the century, whether they are with respect to hylomorphic metaphysics, scientific methodology, or the construction of what could be called a Neo-Stoic ethics.¹⁸ Of course, not all changes produced by Descartes were equally significant or could be equally foreseen from the perspectives of his philosophy. If we took very seriously some of Descartes' more negative assertions about syllogism and dialectics in his early works, we would not have expected the Cartesians to produce anything at all interesting in logic. In fact, after a number of attempts at constructing their own logic or a mixture of the logic of the ancients and the moderns, the Cartesians settled on the *Port-Royal Logic* as their representative logic.

The Port-Royal Logic is a Cartesian logic because it was produced by Antoine Arnauld, the great defender of Descartes during the seventeenth century, and included in an abbreviated form by Régis in his Systeme General, the definitive quadripartite Cartesian textbook. Moreover, the Port-Royal Logic itself was constructed using Cartesian terminology (as were the logics of Le Grand and, obviously, of Régis); the four parts of the Port-Royal Logic involved Conception (Ideas), Judgments, Reasoning, and Method. This looks radically different than the structure of medieval works on terminal logic (such as those of William of Sherwood, Peter of Spain, and William of Ockham); it even looks radically different than the late Scholastic commentaries on Aristotle's Organon by the Coimbrans and Toletus. However, the contrast is not as great when the comparison is drawn between the *Port-Royal Logic* and the Logic of Eustachius (and that of the many subsequent Scholastic textbook writers). Although Eustachius divided his text into three, not four parts, the three parts correspond fairly well with the divisions of the *Port-Royal* Logic, as they are likewise about operations of the mind, the first concerning "simple apprehension," or "things presented to it by a kind of simple vision, without affirmation or denial"; the second, "judgment or enunciation," where the mind "compares these things and separates them out, and either assents to them by affirming or dissents to them by denying"; and the third, (p.207) "discourse or argument," in which it "infers something distinct from [many things collected together] by a process of reasoning or argument." The Scholastics did discuss the question of whether method is a fourth topic separate from "discourse or argument" and usually decided against it; but Louis de Lesclache followed the tripartite division of logic into the three operations of the mind and decided that method or order needed to be discussed in a fourth part, thus yielding a Scholastic logic looking very much like what the Port-Royal Logic will look like a decade or so later. For de Lesclache, logic consists of four parts, the first three concerning "the three actions of the understanding," namely "conception, judgment, and consequence," and the fourth concerning "method," that is "resolution and composition." Thus, it could be said, with some justice, that the logic produced by the Cartesians merely reinforced some developments in seventeenth-century scholastic logic; the Port-Royal Logic, that

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representative Cartesian logic, looks very much like a Neo-Scholastic work.

A similar conclusion could have been reached about ethics: If we focused just on the sections of Descartes' publications that concerned moral philosophy, on the provisional or hypothetical morality of *Discourse*, part III for example, we might not have expected significant Cartesian developments in ethics. In fact, Cartesians did produce a noteworthy Neo-Stoic ethics for the seventeenth century, with their attempts to merge Descartes' moral philosophy, as glimpsed in his *Correspondence* and in the *Passions of the Soul*, with Hobbes' moral and political philosophy (ultimately substituting Pufendorf for Hobbes). The Cartesians developed what they thought were Descartes' views about the ultimate morality, derived from the branches of the tree of philosophy; that is, ethics considered as dependent on the roots and trunk of the tree, or on metaphysics and physics. Scholastic ethics was likewise subalternated to physics, but the similarities between Cartesian and Scholastic ethics were few; the break with Scholasticism seems quite definitive. Cartesian Neo-Stoic ethics was resolutely naturalistic: good is a perfection belonging to us; the greatest good cannot be connected with the goods of body and fortune, which do not depend upon us, but rather with the goods of the soul; the supreme good is a "firm and constant resolution to do everything we judge to be best and to use all our power of mind to know these," and this by itself constitutes all the virtues; happiness and virtue are thus things in our control. While the late Scholastics also held that happiness cannot reside in any created good—not in riches, honors, glory, power, corporeal pleasures—most of them held that man's happiness, both natural and supernatural, resides only in God: perfect happiness cannot be obtained in this life, but man can obtain an imperfect happiness in this life; perfect formal happiness resides in the intellect, in the vision of the divine essence; and natural formal happiness resides in the activity of the intellect; that is, in the most perfect contemplation one can have of God in the natural order. The contrast was clear, and it made its way into the respective accounts of the passions and virtues. Descartes and the Cartesians refashioned elements of Stoic ethics, positions that the Scholastics knew well and brought up frequently, but not simply to catalog and reject them out of hand, as the Scholastics did, but to take them seriously as live philosophical options.

(p.208) In physics and metaphysics, one can notice some of the repercussions of Descartes' decision to set aside substantial forms (except for rational soul) as unnecessary. Scholastic hylomorphism, or substance consisting of matter and form, becomes a dualism of two substances; really, not just modally or rationally, distinct. Since matter is elevated to the rank of substance, it even looks like one substance (soul) can inform another substance (matter). But the contrast with the late Scholastics is not as stark as it might appear at first. Certainly, Descartes' views were radically different from Thomist hylomorphism, where matter is associated with potentiality (passivity) and form with actuality (activity), and prime matter would be pure potentiality (or nothing). On the whole, late Scholastics did not agree with Thomism and had already taken a quasi-dualistic perspective. Matter for them had being and was an incomplete or partial substance; it could even subsist apart from form, at least by God's omnipotence. Thus, substantial forms already routinely informed partial substances. Accompanying this Scotist change in

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the conception of substance was a change in the notion of individuation, also in a Scotist direction, where the principle of individuation resided in an individuating form, not in quantified matter, as the Thomists would have it. Having set aside substantial form, this possibility was not open to Descartes and the Cartesians, except in the case of the human body, informed by a rational soul. We can see that Descartes accepted that option, in a letter that was not published during the seventeenth century and was thus not widely known by the Cartesians. Some Cartesians, such as Cordemoy, embraced atoms and the void in order to try to resolve this issue. Other Cartesians, such as Desgabets and Régis, bothered by the divisibility of matter, with extension being the principal attribute of body, decided that matter is "indefectible" or indestructible, that God conserves both body and mind by the same action he created them: "the mind and the body are two indefectible substances; ... asking whether body and mind are defectible is the same thing as asking whether God's will, which is immutable, can change."

There were obviously many other changes in physics and metaphysics between the late Scholastics and Descartes and between Descartes and the first Cartesians. We have documented a number of such general trends. Descartes altered the traditional relations between physics and mathematics and between physics and metaphysics; Scholastics usually considered mathematics as subalternate to physics, and physics and metaphysics as two separate theoretical sciences. Descartes treated mathematics and physics as two separate theoretical sciences, and physics as subalternate to metaphysics. One can recognize Descartes' view on the relation between physics and metaphysics by their respective positions on his tree of philosophy. We can also note that mathematics does not have a position on that tree. Moreover, I have argued that, for Descartes, physics was not subalternated to mathematics, as some have proposed, but that physics, like mathematics, considered corporeal things as what can be "divided, shaped, and moved in all sorts of ways," what "the geometers call quantity," and Descartes admitted as true nothing "other than what has been deduced from indubitable common notions so evidently that it can stand (**p.209**) for a mathematical demonstration." Descartes rooted his physics in a metaphysics and produced a physics that looked like mathematics not because the physics was rooted in mathematics, but because it was rooted in a metaphysics of clear and distinct ideas about corporeal things viewed quantitatively. But Descartes also moved in a more empirical (quasi-hypothetical deductive) direction, by elaborating elements of his physics that depended on hypotheses which he granted were not eliminable. The results obtained by Descartes' hypotheses were warranted by his clear and distinct principles, but the same results, also warranted by his principles, could have been obtained by different hypotheses. As Descartes put it, the principles from the first two parts of his *Principles* were absolutely certain, while those from the second two parts were only morally certain.

The Cartesians progressed in an even more empirical, hypothetico-deductive direction. One reason for this might have been their de-emphasizing of hyperbolic doubt, thereby undermining Descartes' distinction between absolute and moral certainty. They also attenuated the distinction between physics and mathematics. Moreover, they resolved an ambiguity in Descartes' metaphysics by insisting that concepts such as substance, being,

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and thought are equivocally predicated between God and creatures. That might or might not have been Descartes' position; it was certainly the position of the Cartesians. Hence the Cartesians moved in a more empirical direction in physics and even widened the gap between God and creatures, with God as "super-substantial" or beyond substance.

In sum, the Cartesians created a Neo-Scholastic logic, a Neo-Stoic ethics, and extended and modified parts of Descartes' metaphysics and physics, producing what was considered as the Cartesian "system" of philosophy to be taught in the Schools instead of what the Scholastics offered. It began to dominate until it was displaced by Newtonianism and other global philosophies, but even after it was supplanted it remained a philosophical option to be considered. **(p.210)**

Notes:

(1) I will discuss the French term *novateur* shortly. In English, the cognate is *novelist*, which the *OED* defines as "An innovator (in thought or belief); someone who introduces something new or who favours novelty. Chiefly *derogatory*. Obs."

(2) A search through the Worldcat database for the years up to 1650 yields over ninety Latin titles, with another dozen in French.

(3) Littré 1872–7, "MALEBR., *Rech. vér. II, II, 3*." Also "BOSSUET, *2e instruct. past. sec. 111*: En général, tout novateur est artificieux."

(4) See e.g. Mersenne 1624, 237–8 and 1625, 109–10.

(5) AT i. 158.

(6) Bruno and Vanini had been burned at the stake as heretics, and Campanella was imprisoned for a long time for his views.

(7) For a list of the lists of *novatores*, see Garber, "Why the Scientific Revolution wasn't a Scientific Revolution, and Why it Matters"; for an argument about the changes in the lists over time, see Roux, "An Empire Divided: French Natural Philosophy (1670–1690)." Both articles are in Garber and Roux 2013.

- (8) Babin 1679, 18.
- (9) Babin 1679, 2.
- (10) Babin 1679, 2.
- (11) Brockliss 1987, 354.

(12) The 1691 formulary, titled *The Rector and Professors of Philosophy of the Parisian Academy have met and have written what follows*, required all professors to testify that they would not be teaching eleven different propositions "given to the Rector by the Archbishop from the King ... allegedly extracted from the writings of some professors of

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the University of Paris, which His Majesty desires not to be upheld in the schools." The first six of the formulary propositions were aimed at Cartesianism, mostly against the method of doubt and the relation between philosophy and theology (including proposition 5, which involves the explanation of the Eucharist). Evidently, Pourchot could be celebrated as a Cartesian and maintain that he does not teach these disputed propositions: "1. One must rid oneself of all kinds of prejudices and doubt everything before being certain of any knowledge. 2. One must doubt whether there is a God until one has a clear and distinct knowledge of it. 3. We do not know whether God did not create us such that we are always deceived in the very things that appear the clearest. 4. As a philosopher, one must not develop fully the unfortunate consequences that an opinion might have for faith, even when the opinion appears incompatible with faith; notwithstanding this, one must stop at that opinion, if it is evident. 5. The matter of bodies is nothing other than their extension and one cannot exist without the other." Proposition 6, "One must reject all the reasons the theologians and the philosophers have used until now (with Saint Thomas) to demonstrate the existence of God," does not seem particularly problematic for Cartesians. And propositions 7–11 look like specific doctrinal disputes that do not need to involve Cartesians: "7. Faith, hope, and charity and generally all the supernatural habits are nothing spiritual distinct from the soul, as the natural habits are nothing spiritual distinct from mind and will. 8. All the actions of the infidels are sins. 9. The state of pure nature is impossible. 10. The invincible ignorance of natural right does not excuse sin. 11. One is free, provided that one acts with judgment and with full knowledge, even when one acts necessarily." D'Argentré 1726-38, ii/1.149.

(13) Brockliss 1987, 350.

(14) Voltaire 1741, 89.

(15) Duhem 1990, 183.

(16) AT iii. 298.

(17) See Ch. 1.

(18) It is worth pointing out that some recognized Descartes' ethics as Stoic very early on. Leibniz states: "[Descartes'] morality is a composite of the opinions of the Stoics and Epicureans—something not very difficult to do, for Seneca had already reconciled them quite well. Descartes wants us to follow reason, or else to follow the nature of things, as the Stoics said, something with which everybody will agree. He adds that we should not trouble ourselves with things that are not in our power. That is precisely the Stoic doctrine; it places the greatness and freedom of their much-praised wise man in his strength of mind to do without things that do not depend upon us, and endure things when they come in spite of ourselves. That is why I am accustomed to calling this morality the art of patience. The supreme good, according to the Stoics, and even according to Aristotle, is to act in accordance with virtue or prudence, and the pleasure resulting from this resolution is properly the tranquility of soul or indifference (*indoleance*) that both the Stoics and Epicureans sought for and recommended, under different names. We need

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only inspect the incomparable manual of Epictetus and the Epicurean of Laercia to admit that Descartes has not much advanced the practice of morality." Leibniz 1989, 241.



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Descartes and the First Cartesians

Roger Ariew

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Roger Ariew

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