The Best of All Possible Worlds

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A STORY OF PHILOSOPHERS, GOD, AND EVIL IN THE AGE OF REASON

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Princeton University Press
Princeton and Oxford

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Published in 2010 by Princeton University Press, 41 William Street,
Princeton, New Jersey 08540
In the United Kingdom: Princeton University Press, 6 Oxford Street,
Woodstock, Oxfordshire OX20 1TW
press.princeton.edu

Published by arrangement with Farrar, Straus and Giroux, LLC

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First edition, 2008
First Princeton edition, 2010

Library of Congress Cataloging-in-Publication Data
Nadler, Steven M., 1958–
The best of all possible worlds : a story of philosophers, God, and evil in the Age of Reason / Steven Nadler. — 1st Princeton ed.
p. cm.
Originally published: New York : Farrar. Straus, and Giroux, 2008.
Includes bibliographical references (p.) and index.
ISBN 978-0-691-14531-0 (pbk. : alk. paper)
1. God. 2. Theodicy. 3. Leibniz, Gottfried Wilhelm, Freiherr von, 1646–1716. 4. Malebranche, Nicolas, 1638–1715. 5. Arnauld, Antoine, 1612–1694. I. Title.
B2599.G63N33 2010
214.09'032—dc22

2009047154

British Library Cataloging-in-Publication Data is available

Printed on acid-free paper. ∞

Printed in the United States of America

1 3 5 7 9 10 8 6 4 2

Frontispiece: *Satan in Paradise, a scene from Milton's* Paradise Lost, engraving by Gustave Dore, 1870

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Preface

The history of philosophy is punctuated by momentous and deservedly famous episodes. The trial and death of Socrates; Plato's coronation of the philosopher-kings in the *Republic*; Augustine's spiritual (and sexual) turmoil and subsequent epiphany, so eloquently captured in his *Confessions*; Aquinas's encyclopedic reconciliation of faith and reason in the *Summa Theologiae*; Descartes's formulation of the *cogito ergo sum* argument; and Kant's grand project of establishing once and for all the proper domain of metaphysics in the *Critique of Pure Reason*—to his mind, the philosophical equivalent of the Copernican revolution in astronomy—constitute only a few of philosophy's greatest hits.

This book is not about any such marquee event. It tells a story that involves neither global paradigm shifts nor revolutionary philosophical insights. It is not concerned with any discoveries that transformed the world, inventions that saved civilization, or confrontations that changed history. It is a relatively intimate and quiet story about three philosophers, onetime friends who, for a brief period, were together

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in Paris in the 1670s but soon went their separate ways, personally and philosophically. Much of the action takes place not in the academy or the salon, early modern French society's counterparts to the ancient Greek agora, but in books, articles, reviews, and letters. Sometimes, the conversation is direct and highly public; just as often, it is a virtual dialogue that must be reconstructed from private writings, marginalia, and viva voce comments that exist for us only because someone saw fit to record them.

It is a rich and fascinating moment in the history of ideas, one that involves perennial questions of philosophy about the world, human nature, morality, freedom, rationality, and, above all, God. Of the principal actors, only the brilliant philosopher, scientist, and mathematician Gottfried Wilhelm Leibniz is likely to be familiar to most readers today. But to their contemporaries, the Catholic priests Antoine Arnauld and Nicolas Malebranche were intellectual celebrities of the first order. These were the greatest philosophical and theological minds of their time, and their opinions and disputes were well known to much of the learned world of the seventeenth century.

The three thinkers differed vastly in personality and temperament, and so their relationships were full of drama. As their philosophical divergences became more obvious (and more irreconcilable) over the years, the grand debate in which they engaged—the subject of this book—grew in intensity, with insults and abuse (and an occasional apology) hurled across great distances both geographic and religious. There is much passion behind the philosophy, primarily because in this period, philosophical disagreements rarely failed to have theological, moral, political, and even salvational implications. These philosophers believed that the truths with which they were contending had ramifications not just for this world but for the hereafter as well.

In the seventeenth century, the problem of evil mattered. Philosophers and theologians wrestled with the question of how to reconcile the obvious fact that the world is full of sin and suffering with what for them was the nonnegotiable belief that the universe was created by

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an infinitely good, wise, all-powerful, and all-knowing God. But the problem of evil was only one battle in a much larger conflict. Behind it lay the even greater and more important challenge of getting the conception of God right: How does God act? With what faculties and capacities is He endowed? To what extent is His behavior, like ours, amenable to rational understanding? Can His ways be explained and justified? In this story, not just the problem of evil but practically every issue of metaphysics, natural philosophy (natural science), epistemology, ethics, and politics intersects with the fundamental question of how to represent the nature of God and of His agency. An early modern thinker's conception of God was of great consequence for his views on the origins and nature of the universe, the possibility of human knowledge, the objectivity of moral and aesthetic values, and the principles of justice.

Leibniz and Malebranche, adopting a traditional view, believed that God is, in many respects, very much like us: guided in His choices by rational deliberation and acting for the sake of what He (infallibly) believes to be good. Arnauld, taking a more radical course—one traced by his philosophical mentor, Descartes—argued that such anthropomorphism in the depiction of divine agency is dangerous to true Christian faith; God, he insisted, is not a rational "person," and no comparison can be drawn between the way God acts and the way we act. The God of Leibniz and Malebranche is endowed with practical reason; the God of Arnauld transcends reason altogether. One camp saw the universe as the product of wisdom and as embodying eternal, objective values of goodness and beauty; the other regarded all of creation, including every truth and every normative value, ultimately as the effect of an arbitrary, all-powerful will. Great stakes indeed.

This was the philosophical debate occupying center stage in the final quarter of the seventeenth century, a debate whose vehemence was fueled by religious differences, ecclesiastic rivalries, political developments, and even personal passions. Leibniz, Arnauld, and Malebranche are long dead, and their intellectual world has disappeared with the

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early modern social, religious, and political landscape that served as its backdrop. But the philosophical questions they confronted—Why is there something rather than nothing? Why is the world as it is, not just physically but morally as well? Why do bad things happen to good people? How can we make sense of suffering and human evil that often seem beyond comprehension?—puzzle us still.

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Leibniz in Paris

In the early spring of 1672, a German secret agent arrived in Paris. He carried with him a plan that he and his patrons believed could pave the way to peace among nations and eventually return to Europe the religious unity that had been lost with the Protestant Reformation.

It was a grandiose project based on visionary hopes. Although the visit had been approved, even encouraged, by the French, the envoy was uncertain as to what kind of reception to expect. He was new to the diplomatic game and unfamiliar with the ministers with whom he hoped to meet. He must also have been forewarned by his superiors about the pitfalls of making alliances in the volatile political environment of the seventeenth century, and especially with as unpredictable and opportunistic a partner as France. What might be agreed to one day could easily be the forgotten victim of new alliances the next. With the possibility of difficult and protracted negotiations ahead, an extended stay in the city was arranged, and the agent settled into an

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apartment on the Left Bank. There was some urgency to his mission, however, as the great powers were once again on the brink of war.

For eighty years, from France's decades of civil turmoil in the sixteenth century through the falling out of the German states between 1618 and 1648—the so-called Thirty Years War—the continent had been wracked by incessant conflict. There were various causes for these hostilities, including domestic political crises; class struggle; territorial disputes; the clash between centralized power and local independence within the Holy Roman Empire (a vast domain extending west to east from France to Poland, and north to south from the Low Countries to the Italian states); and long-standing feuds involving the Empire, France, Spain, Denmark, Sweden, England, the Netherlands, and others. As mercenary armies marched across frontiers and waged their battles with little regard for collateral damage, civilian populations were decimated, crops were ravaged, and the social and economic upheaval made life utterly miserable. The medieval Western world of many small kingdoms, however competitive, violent, and unstable a place it may have been, had given way to the uncertainties of post-feudal society and to the more complicated and destructive rivalries within and among great nation-states.

Gone, too, was the general uniformity of faith that—despite schisms and heresies, as well as the occasional threat of unbelief—had long comforted medieval Europe in the face of violence, pestilence, and other evils. The wars of the late sixteenth and early seventeenth centuries were also, especially in France and Germany, religious wars, the sad legacy of the Reformation. In France, the majority Catholics battled Calvinist Huguenots—a vicious conflict that was only superficially (and momentarily) quieted by the Edict of Nantes in 1598, which granted religious and political rights to the Protestants. In the lands of the Holy Roman Empire, the tenuous unity among the three hundred member-states was undone by fighting among Catholic,

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Lutheran, and Calvinist forces. The German troubles were exacerbated by outside meddling: when one side seemed about to prevail, sympathetic factions from elsewhere came to the aid of the other. Thus, in the 1630s, just as Catholic Bavaria and its Counter-Reformation allies were about to overwhelm the Lutheran territories of the north, French, Danish, and Swedish forces intervened on behalf of the Protestants.

Finally, with the land of Europe laid to waste and the warring parties drained of their resources, some degree of order was restored in 1648 with the signing of the Peace of Westphalia. This broad series of agreements was supposed to bring an end to the warfare and introduce lasting peace and stability to the continent. The treaty redrew political boundaries and established new religious ones. The German lands were now self-governing territories, with each to determine its own official religion. (The Peace also thereby initiated the ultimate dissolution of the Holy Roman Empire.)

The respite, however, was only temporary, and over the intervening years dynastic rivalry, expansionist desire, and, above all, economic competition fueled a number of relatively short-lived but highly consequential conflicts, particularly among France, Spain, England, and the Netherlands. With the new year of 1672, the one-hundredth anniversary of the beginning of the hostilities that ended with the Peace,[1] Europe seemed destined to endure yet another century of fighting.

As in 1572, everyone's attention was once again focused on a strategically important and highly lucrative corridor of territory bordering the North Sea: the Low Countries, what is now Belgium, Luxembourg, and the Netherlands. The first time around, the attack had been led by Spain, which was seeking to keep rebellious provinces in line. The Hapsburgs, occupying the Spanish throne, inherited these properties of the French dukes of Burgundy in the mid-sixteenth century. But distant Catholic rule did not sit well with the local Calvinist population that dominated in the seven northernmost provinces, and

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by the early 1570s the revolt was in full force. Spain responded with a considerable show of strength, and the war lasted eighty years (concluding with the Treaty of Münster, part of the terms of the Peace of Westphalia).

This time, it was France that had made the first move. As one of the superpowers of the period, the Bourbon monarchy represented an effective counterweight to its Iberian Hapsburg archenemy. The aggressive and ever-acquisitive Louis XIV had long been covetous of the southern Low Countries, the Catholic provinces that remained loyal to Spain and were now called the Spanish Netherlands; he wanted to see them restored to French rule. Louis finally invaded Flanders and the other southern provinces in 1667. Then, in alliance with the prince-bishop of Cologne, the prince-bishop of Münster, and the crown of England, the French king turned his sights on what was now the Dutch Republic, the Protestant provinces of the northern Netherlands that, having won their independence from Spain, were currently enjoying their Golden Age.

There were long-standing political and economic grievances between France and the United Provinces, including clashes over trade, territory, and alliances. It was also a classic confrontation between old and new, between Catholic and Protestant, and between royal absolutism and republicanism. While occasionally willing to side with Holland when it suited its geopolitical purposes—for example, in the Second Anglo-Dutch War, in 1665—the long-established French monarchy had little tolerance for the upstart Calvinist republic. It even actively sought to undermine the quasi-democratic federation of equal and independent provinces and replace it with a centralized government ruled by a kinglike figure, one who would serve France as a reliable and like-minded ally in the turbulent political mix of the period. As tensions increased, a number of attempts at a negotiated settlement between the two powers failed. Not one to wait for a diplomatic solution when a military one was at hand, Louis declared war on the Dutch in January 1672.

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By the time the German emissary set off for Paris in late March on behalf of his employer, Johann Philipp von Schönborn, the Elector of Mainz, the French army had already crossed the Dutch border. Johann Philipp and other German princes, whose lands were still recovering from the devastation of the Thirty Years War, were worried that they might be next on Louis's agenda. The Elector took the advice of his minister of state, Baron Johann Christian von Boineberg, and sent his young privy counselor to France to see if the Sun King's attention could be turned to other, perhaps more enticing projects.

It was no ordinary diplomat whom the Elector and the baron entrusted with this delicate foreign mission. While inexperienced in foreign affairs and physically and socially awkward, he was gifted in many ways. The twenty-six-year-old man on his way to the French capital was a philosopher-scientist-mathematician of great promise, an individual destined to become a major player in Europe's intellectual life in the seventeenth century. He was, in fact, one of the great geniuses of all time.

Gottfried Wilhelm Leibniz was born on July 1, 1646, in the Lutheran town of Leipzig, part of Saxony. His father, Friedrich, was vice chairman of the philosophy faculty and a professor of moral philosophy at the University of Leipzig. His mother, Catharina Schmuck, was Friedrich's third wife.[2]

Leibniz studied liberal arts at the University of Leipzig and earned his bachelor's degree in 1663 with a dissertation titled *A Metaphysical Disputation on the Principle of Individuation*. Despite his talents for abstract philosophical thinking, he decided on a career in law. After a summer studying mathematics at the University of Jena, he returned to Leipzig to pursue his degrees in jurisprudence. Although Leibniz received the bachelor's degree, the university refused to grant him a doctoral degree, which was required for admission to the university's faculty. The problem had nothing to do with the merit of Leibniz's

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continuous quantity from discontinuous units (such as a line from points, continuous motion from discrete movements, and time from moments). He also wrote on jurisprudential and religious themes (including the immortality of the soul and the resurrection of the body) and on political matters. He even published (anonymously) a satire on Louis XIV and his militaristic ambitions, *The Most Christian Mars*, in which he mockingly "justifies" the French king's aggressive behavior toward his European neighbors by explaining that since the Flemish, Dutch, and German lands lay between France and "the Turks," Louis has first to pass through the lands of these "poor Christians" before attacking the enemy to the east.[5]

Leibniz began by far the greatest and most ambitious of his projects in this period, one that would assume immense significance and consume much energy throughout his life: his self-appointed mission to heal the schism at the heart of Western Christianity. He believed that the issues that divided Catholics and Protestants in Europe at the time were not so insuperable that some common ground could not be found. Much of the problem, he insisted, lay not in basic dogma but in the particular, nonessential beliefs and customs that had developed within each tradition. "Most of the objections that can be made against Rome regard the practice of the people rather than the dogmas," he wrote in 1682.[6] If only one could discover and properly interpret the core beliefs that unite all Christians—and distill them from the layers of ecclesiastic organization, ceremonial observance, and sectarian understanding within which they had become encrusted—there would be a possibility of reuniting the faithful within a single church. Leibniz would begin his reasoning with the Catholics and Lutherans in the German lands, but his hopes extended to a reconciliation throughout all of European Christendom.

It is probably no accident that many of Leibniz's patrons were former Protestants who had converted to Catholicism: Johann Philipp; Baron von Boineberg; the duke of Hanover, Johann Friedrich von

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Braunschweig-Lüneburg, whom Leibniz would serve after his Paris sojourn; and Ernst von Hessen-Rheinfels, who in the 1680s played essentially the same role in Leibniz's life as Boineberg does in the pre-Paris period. While Leibniz himself remained a Lutheran throughout his life (although it is unclear how deeply he held his religious beliefs), his discussions and plans with these Catholic authority figures stimulated and sustained his commitment to a grand ecumenical project.

Leibniz believed that with little difficulty, Lutherans could approve the substance of much of what had been proclaimed by the Catholic Church's Council of Trent. Meeting from 1545 to 1563, and acting in response to the threat posed by the Protestant Reformation, this ecumenical body was charged with specifying those doctrines of salvation, sacramental theology, and canon law that constitute the core and non-negotiable principles of Christianity; it also sought to standardize the practice of the Latin Mass, into whose celebration many modifications had been introduced over time. If there were any controversial or ambiguous claims about grace, penitence, justification, or other mysteries arising from the council's deliberations, Leibniz insisted, they could easily be reinterpreted in a way consistent with both Catholic dogma and the principles of the Confession of Augsburg of 1530, which established the articles of faith for Lutherans.

It was an extremely optimistic, even utopian perspective to take. The divide between Roman Catholicism and Lutheranism seemed unbridgeable on many central points. Where the Catholics allowed for salvation through good works, the Lutherans insisted on justification through faith alone. Moreover, Lutherans believed that a human being was completely passive under the influence of grace, while the Council of Trent explicitly condemned this opinion. But Leibniz was nothing if not an optimist. Thus, in the late 1660s and early 1670s, while still at the court in Mainz, and at the urging of the Catholic Boineberg, he began composing a number of theological and religious works devoted not just to refuting atheists and materialists but also to

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showing that there is room for essential doctrinal agreement between Catholics and Protestants. He hoped to win approval from the Pope for his philosophically informed but (from Rome's point of view) rather unorthodox interpretations of various Christian dogma, especially those concerning the Eucharist. In writings later collected as the *Catholic Demonstrations*, Leibniz argued for the existence of God and for the immateriality and, consequently, the immortality of the soul. He then showed how the miraculous transubstantiation of the wine and bread into the blood and body of Christ at the moment of consecration could be understood in a way that was both acceptable to Protestants (who rejected transubstantiation, the standard Catholic idea that the substance of the bread is destroyed or removed and replaced with the substance of Christ's body during the Eucharist, albeit underneath the freestanding sensory appearance of bread) and consistent with the Council of Trent's demand that there be a "real presence" of Christ in the host.[7]

Throughout Leibniz's career, much of what he says about God, freedom, grace, and evil—including his claim that ours is the best of all possible worlds—relates to this grand unification project. His choice of correspondents, the content and tenor of his writings, even his residence and travels were often dictated by the interfaith dialogue he sought to initiate and the religious reconciliation he hoped eventually to accomplish.

Mainz was a small town. Despite the presence of the court of the Elector, it was not cosmopolitan enough for a man of Leibniz's ambitions. His gaze, like that of many intellectuals of the time, was directed to the cultural and intellectual capital of Europe: Paris.

Leibniz followed events on the French intellectual scene closely. He sought correspondents in Paris who could enlighten him on current events, recent publications, and the activities of philosophical and

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scientific societies. Above all, he had a keen interest in what was happening at the Académie des Sciences. He aspired one day to belong to this young but august body, and the dedication of his "Abstract Theory of Motion" to the Académie was no doubt a ploy to gain its favor. To Leibniz, Paris was "the most knowledgeable and powerful city in the universe."[8] If there was to be any hope of advancing his scientific, mathematical, and philosophical interests, not to mention realizing his dream of ecumenical unity, he would have to find a way to get there.

The opportunity finally arrived with the French invasion of the Netherlands. Even before the attack on the Dutch Republic, Leibniz had been pondering how the German states should deal with the growing French threat. He believed that the best defense would be to send Louis XIV's army on a detour. This would require convincing the king that his real interests lay elsewhere, away from the German lands and from Christian territory altogether.

What Leibniz had in mind was a new crusade against the infidel. This time, however, the target would be not Jerusalem but Egypt. A conquest of that ancient land would benefit not only France, Leibniz intended to argue, but all of Europe. It would bring intramural peace among the Western powers and allow the Christian states to band together and strengthen their defenses against the ever-present Muslim threat from the east, especially the Turks.

Boineberg was very enthusiastic about Leibniz's *Consilium Aegyptiacum*, and he was soon able to enlist the Elector's support for it. He had Leibniz draft a memorandum for the French king that outlined the plan and highlighted its advantages both for France itself—much more effectively than an open war, a successful Egyptian campaign would weaken the Dutch military and economy and render the French "masters of the seas"—and, more momentously, for "the well-being of all humankind."[9] It was a fantastical project—"a bit chimerical," as Boineberg puts it in his cover letter to the French king—but it was, Boineberg thought, the Electorate's best hope.

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The French foreign minister, Simon Arnauld de Pomponne, was initially intrigued by the proposition, although he thought that its execution would demand more detail. He discussed the matter with the king, and in a letter of February 1672 he encouraged Boineberg or a representative to come to Paris to present the plan formally.

Boineberg knew that the mission had to be a secret one, lest the Dutch get word of it. He also suggested to Pomponne that it would be best if the author of the project himself came to lead the discussions with the French. Thus, in March 1672, Leibniz was on his way to Paris. In his bag was his "Plan for a New Holy War."

The Paris that greeted Leibniz was not yet Baron von Hausmann's city of grand boulevards. But neither was it any longer the walled medieval town that it had been up through the sixteenth century. In fact, just a few years before Leibniz's French sojourn, the king and his powerful finance minister, Jean-Baptiste Colbert, had decided to remake the city into a modern metropolis. They began by tearing down the medieval ramparts that encased the northern and southern sections of the city—then, as now, divided into Left and Right banks by the River Seine—and replacing them with tree-lined thoroughfares. This allowed the city to flow seamlessly into the *faubourgs*, or outlying residential areas. They also initiated a campaign of monumental architecture in the classical style: grand public buildings, triumphal arches, commemorative statues, and open public squares. The landmark structures of the Collège des Quatre-Nations, Les Invalides, the Observatoire, and the Gobelins all date from this period.[10] In all, Louis and his minister spent over twenty million *livres* on architecture and landscaping for Paris, much of it on the Louvre and the adjacent Tuilleries, despite the fact that the king himself did not much care for the city and far preferred his new and still-expanding home at Versailles. (He decamped from the Louvre, the royal palace adjacent to the river on the Right Bank, in February of 1670, never again to spend another night

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Leibniz often went to the theater, once catching a performance of one of Corneille's works, and was a great admirer of opera as well.

Upon his arrival, he immediately started taking French lessons. While working in Mainz for the Elector, he must have had some familiarity with French, if only a basic reading knowledge. But he needed to be fluent and idiomatic in the language that was becoming, along with Latin, the lingua franca of the international Republic of Letters. (By the end of his stay, Leibniz said that he had come to "speak in Parisian."[13]) He also studied Greek, with Pierre-Daniel Huet, at that time an assistant tutor to the Dauphin, later the bishop of Arranches and a major figure on the French philosophical and theological scene.

Leibniz also made the rounds of Paris's scientific and philosophical community and sought out the savants who could be of service to his intellectual plans. "Paris is a place where it is difficult to distinguish oneself," he wrote. "One finds here the most expert men of our time, in every kind of science, and it would take a lot of work and a bit of fortitude to make a name for oneself here."[14] The city, he says in a letter to his friend Louis Ferrand soon after his arrival, "is paved with so many learned people," and he regretted the amount of time he had to spend on his official business. "I am reduced to a voluntary hermetic existence, speaking practically to no one aside from two laborers, in the midst of so many great men."[15] Still, life in Paris was not all diplomatic drudgery for Leibniz: when not engaged in what he called *mon affaire*, he attended meetings of the Académie des Sciences in the king's library and mingled with its international cohort of mathematicians, physicists, and astronomers, including Giovanni Cassini, the discoverer of Jupiter's spot and of the gap in Saturn's rings; Otto de Guericke, a fellow alumnus of the University of Leipzig; the Danish astronomer Olaus Roemer; and Claude Perrault, a French doctor and physicist.

In terms of his own development, the most important acquain-

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tance that Leibniz made in Paris was the Dutch scientist and mathematician Christiaan Huygens. Huygens had been in Paris since 1666, brought there by Colbert himself to create the Académie des Sciences. Leibniz had extraordinary natural mathematical talent but was still a relative novice in the discipline. Neglecting for a time his other interests, especially those for which he needed more advanced mathematical training, he worked closely with Huygens, supplementing those lessons by reading the mathematical papers of Blaise Pascal, and quickly gained a solid reputation as a mathematician. "I am attending here neither to jurisprudence, nor to belles lettres, nor to controversies (things that principally occupied me in Germany), and instead I have begun basic studies to understand mathematics, in which I have had the good fortune to discover thoroughly unfamiliar truths, as letters from the most skilled mathematicians of our time will attest."[16] Good fortune indeed: by the end of Leibniz's four-year stay in Paris, he had invented the calculus.

Leibniz hardly ignored his other philosophical and scientific concerns while in Paris. His writings from this period cover a range of issues in metaphysics, physics, logic, and philosophical theology, many of which continue the lines of thought he had been pursuing while still in Mainz. In his papers between 1672 and 1676, there is more work on the problem of the continuum in a variety of domains, as well as essays on the cohesion of bodies, the nature of the soul, the cause of motion, the relationship between mind and body, and "the existence of a most perfect being." Since 1669, Leibniz had also been concerned with a reconciliation between the new mathematical science of nature—devoted to clearly formulated, quantifiable mechanistic explanations of phenomena—and some of the metaphysical principles of the ancients, especially the dynamic role that, in the Aristotelian philosophy, immaterial entities (such as minds or souls) play in the world of bodies.[17] Moreover, this period marked the beginning of his long-term concern with the problem of evil and his idea that ours is the best of all possible worlds. Nonetheless—and this is an indica-

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tion of Leibniz's prodigious intellectual energy—as much attention as all of these other questions received, they often took a backseat at this time to his mathematical education.

During his Paris period, Leibniz also made a short voyage to England, in early 1673. There he attended meetings of the Royal Society and made the acquaintance of England's own leading scientists, including Henry Oldenburg, Robert Boyle, and the irascible Robert Hooke—but not, notably, Isaac Newton, with whom Leibniz would soon engage in a priority dispute over the invention of the calculus. Oldenburg, the Society's corresponding secretary, arranged for Leibniz to give a demonstration of the arithmetical calculating machine that he had been working on in Paris. The event was not entirely successful, as Leibniz had some trouble getting the machine to work properly, but that did not prevent the Society from unanimously electing him a fellow in April of that year.

He did not have as much luck with his French scientific colleagues. Despite Leibniz's growing reputation and the evident admiration for him among many of his peers—"Never has a foreigner . . . had a more favorable reception from the people of merit," he wrote in 1672[18]—there was solid resistance to admitting this young German to the king's official body of learned gentlemen. In 1675, Leibniz's nomination for membership to the Académie des Sciences was rejected. The fact that he was not a Catholic did not help his cause. Leibniz, however, believed that his nationality was the true reason for his rejection. He suspected that some of the academicians felt that there were already enough foreign members in the organization. He also blamed the matter on personal animus, as he had the disappointment he experienced at the University of Leipzig; in this case, it was envy over his talents and accomplishments. He did not receive the honor until 1700.

This slight did little to deflate Leibniz's high opinion of himself. While he was capable of self-deprecation before his social superiors, particularly those with whom he wished to ingratiate himself (often for the purpose of financial gain), he was also given, on occasion, to

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exaggeration. In a letter of 1675, with only a handful of publications to his name, he nonetheless describes "the renown that I have acquired in the courts of Princes and among a good part of the learned and illustrious of Europe."[19] Leibniz had a robust sense of his own innate talents and a clear idea of what he could, if properly supported, contribute to the good of humankind. Fortunately, his grandiose self-assessment turned out to be correct.

In the end, the Egyptian plan never got very far. It is unclear whether the French king ever gave it a formal hearing; Leibniz certainly never had the chance to present it to Louis directly, and may never even have seen the foreign minister, Pomponne, with whom he had some difficulty arranging a meeting. Besides, with France already in control of a large portion of Dutch territory, an important element of the project was moot (although Leibniz continued to revise the plan to keep it up with current events). Moreover, despite his initial interest in the project, Pomponne soon dismissed the whole idea as ridiculous and anachronistic. As early as June 1672, he declared that "holy wars . . . have been out of fashion since Saint Louis."[20] (Louis IX had died in 1270.)

Leibniz was sorely disappointed. While the Egyptian project was a convenient excuse for an extended stay in Paris, he took it very seriously; it was something he had long worked on and in which he had placed great hope. Still, there were other business matters to attend to. One of Boineberg's other motives in sending his secretary to France was to have Leibniz take care of some of his financial interests there, including the collection of back rents he was owed on several properties. And in November 1672, Boineberg's son, Philipp Wilhelm, arrived in Paris to be tutored by Leibniz. It was not an easy job—Leibniz set up a very demanding daily schedule, but the young man had other things on his mind besides book learning—and Leibniz would soon chafe under these duties.

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Then, in December of that year, devastating news arrived. Baron von Boineberg was dead from a stroke. Leibniz was deeply affected by the loss. He called Boineberg "one of the great men of the century," and regarded him not only as his employer but also as a close friend.[21] Boineberg's death was followed just a few months later by the death of their mutual employer, Johann Philipp. With his two patrons gone, Leibniz now was in danger of being cast adrift. While these deaths meant there was less pressure to return soon to Mainz, they also represented the possibility of losing the moral and financial support that would allow him to remain in Paris. Fortunately, the new Elector, Lothar Friedrich von Metternich, saw the advantage of having an agent in the French capital, and he agreed to allow Leibniz to continue on as a kind of cultural attaché who would report back on scientific and artistic matters.[22]

Leibniz loved Paris. He had arrived with enormous expectations, and the city exceeded all of them. It was an exciting environment for him, both intellectually and socially, and his experience there played a crucial role in his philosophical development and in his reputation in the world of ideas. He also enjoyed himself immensely in the French capital and was reluctant to leave. Always seeking to improve his financial condition, Leibniz nevertheless turned down a number of potentially lucrative offers while in Paris—including the positions of secretary to the chief minister of the king of Denmark and counselor to Johann Friedrich, duke of Hanover. Although he had been dismissed as Philipp Wilhelm's tutor by the Boineberg family in September 1674 and his relationship with the family had slowly deteriorated after the baron's death, Leibniz had means enough to linger in Paris for over a year. Eventually, however, he had to face economic reality. In late 1675, in need of a secure position with a guaranteed salary, he agreed at last to serve Johann Friedrich as counselor and director of the ducal library in Hanover. He was supposed to be on duty by Jan-

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as the cathedral schools were becoming great centers of learning, it was on this bridge that philosophy first found a home in the city. Here Peter Abelard and other masters associated with the school of Nôtre Dame, as well as itinerant logicians and metaphysicians, held forth *en pleine air*, lecturing students and overseeing disputations. These were highly public, often raucous exercises, and anyone was free to listen or engage the master in argument. There was even a quasi-formal school of philosophy associated with the bridge, led by Adam of Balsham, an Englishman also known as Adam Parvipontanus, or Adam du Petit Pont.

Over four centuries later, the Petit Pont was a ten-minute walk from Leibniz's lodgings behind the church of St.-Sulpice. He would have traversed it many times in his relentless quest to meet with Arnauld de Pomponne and other ministers to convince them of the virtues of the Egyptian plan. By 1672, however, philosophy in Paris had long been an indoor activity, practiced mainly in the arts and theology faculties of the university, as well as in the liberal arts curricula of the *collèges de pleine exercise*, preparatory schools for university often associated with one religious order or another (such as the Jesuits). In the official degree-granting institutions and their associated schools, philosophy was exclusively a clerical affair; the learned doctors and masters of the faculties had to have taken ecclesiastic vows.

It was also, for the most part, an Aristotelian affair. Teaching in logic, natural philosophy (including physics), moral philosophy, and metaphysics, all part of the arts curriculum, was based on textbooks by latter-day commentators and expositors of Aristotle's thought. Even in the higher faculties of theology and medicine, the curriculum was set by the principles of the peripatetic philosophy. Aristotle taught that nature is governed by four types of causality (material, efficient, formal, and final) and is grounded in four primary qualities (wet, dry, hot, and cold) whose various combinations gave rise to the four elements (earth, air, fire, and water); the cosmos is a system of concentric spheres, each inhabited by the fixed stars or a heavenly body, with the

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earth at the center of the innermost sphere; reasoning follows the syllogistic and modal canons of Aristotle's organon; and achieving happiness or human flourishing is a matter of following the mean and acquiring the proper moral and intellectual virtues.

Although the general Aristotelian content of the curriculum had been set for centuries by intellectual and religious tradition—and the great medieval Scholastic theologians, such as Thomas Aquinas, were mostly Aristotelians—it was now, in seventeenth-century France, also mandated by law. In 1624, the Parlement of Paris had issued a decree requiring that teaching in the university be based exclusively on the works of Aristotle. In 1671, this writ was renewed and made the law of the land by order of the king. Thus, one year before Leibniz's arrival in his city, the archbishop of Paris, François de Harlay, issued the following proclamation:

> The king, having learned that certain opinions that the faculty of theology had once censored, and the Parlement had prohibited from teaching and from publishing, are now being disseminated, not only in the university, but also in the rest of this city and in certain parts of the kingdom . . . and wishing to prevent the course of this opinion that could bring some confusion in the explanation of our mysteries, pushed by his zeal and his ordinary piety, has commanded me to tell you of his intentions. The King exhorts you, sirs, to make it so that no other doctrine than the one brought forth by the rules and statutes of the university is taught in the universities and put into theses, and leaves you to your prudent and wise conduct to take the necessary path for this.[1]

The archbishop, the king, the university rectors, and many others were particularly worried about the increasing influence among professors in the arts and theology faculties of a philosophy of more re-

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cent vintage than the Aristotelian variety. To control it was not just a matter of exercising discipline within the academy. Although the founder of this school of thought had been dead for more than twenty years by the time of the later prohibition, his ideas were spreading with a religious fervor among the educated class in Paris and beyond.

On Saturday, June 24, 1667, the intellectual community of Paris, along with many ecclesiastics and aristocrats and a large crowd of curious onlookers, gathered in the church of Ste. Geneviève du Mont. The occasion was the return to France of the remains of the philosopher and scientist René Descartes, who had died in 1650. Descartes had lived in the Netherlands for most of his adult life, although his final months were spent in Sweden, where he went, reluctantly, to provide philosophy lessons to Queen Christina. Unprepared for the harsh winter—Sweden was, he said, a land "where men's thoughts freeze like the water"—and forced to rise at the ungodly hour of four o'clock in the morning, the fifty-three-year-old Descartes died of pneumonia on a frigid day in February. Now, seventeen years later, with his remains finally back in his native country, Descartes's friends and admirers intended to commemorate the occasion with a ceremony in one of France's most revered sites, close by the university and named for the patron saint of Paris. (The church was torn down in the eighteenth century; the Panthéon now stands in its place.)

The event, with great pomp and circumstance, was to begin with a mass, followed by an oration prepared by one of Descartes's closest friends, Claude Clerselier, and delivered by Father L'Allemant, chancellor of the University of Paris. No sooner had the proceedings begun, however, than they were interrupted by the authorities. The king, concerned about the effect that such open glorification of the philosopher would have, declared at the last minute that there should be no public eulogies for Descartes. The rest of the interment cere-

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mony continued as planned, but Descartes's praises were not to be sung on this day.[2]

The king also had Descartes's philosophy in mind when, four years later, he issued the edict forbidding the teaching of any philosophy other than Aristotle's. The new system of Cartesianism represented, in the opinion of the court, the Church, and university officials, the greatest threat to the intellectual status quo. Descartes's scientific program and its metaphysical and epistemological foundations were slowly but surely making converts among the professors; it had already infiltrated learned society at large, where in private gatherings and public addresses its principles were studied, tested, and promoted. Much more was at stake than Aristotle's status as "the philosopher." As the proclamation's reference to "our mysteries" indicates, the authorities believed that nothing less than the fundamental dogmas of the Catholic faith were at risk from the Cartesian contagion.

In his *Discourse on Method* (1637), *Meditations on First Philosophy* (1641), and *Principles of Philosophy* (1644)—the latter designed as a textbook suitable for replacing the Scholastic compendia currently used in the schools—Descartes explicitly rejects the basic principles of Aristotelian philosophy. The Aristotelian Scholastics described a hylomorphic world picture—one in which individual things, or substances, are composite entities constituted by matter and forms. Matter is responsible for the numerical individuality of a thing, its concrete "this-ness" or place in space and time. The forms inhering in a thing's matter include a "substantial" form, which accounts for its essential properties and designates it as belonging to a certain natural kind, and "accidental" forms, which account for the nonessential properties that differentiate individuals within the same kind. Thus, the difference between a horse and a cow lies in the fact that two parcels of matter are informed by different substantial forms. The difference between one horse and another horse is that the two individual horses, while they both possess the same substantial form (the horse form), possess different accidental forms (for example, one has the form whiteness,

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the other has the form brownness). In a human being, the body has its own substantial form, making it a human body (as opposed to a horse body). But there is also the human soul, which is the substantial form that transforms a human body into a living, intelligent human being.

The metaphysics of substantial and accidental forms also plays an important role in Aristotelian natural science. Medieval and early modern Scholastics employed these forms, sometimes called "real qualities," to explain the phenomena of nature, including the generation, alteration, and corruption of individual substances and the dynamic behavior of bodies. An individual thing of a certain kind comes into being, changes, and goes out of being because its matter receives or loses the relevant forms. And because matter by itself is purely passive, all activity in natural things, especially their efficient causal powers, derives from the forms and qualities inhering in the matter.

This model of explanation can be illustrated by three cases of natural phenomena that have special importance for early modern science: color, gravity, and magnetism. A swan is white because the quality whiteness is present in it; and wine and gold have their respective visible colors because the requisite real qualities of wine and gold are present in them. True color, then, unlike merely apparent color, is neither a property of light nor an effect in the sense organs or mind of the perceiver, but a certain quality that a body must possess in order to be colored. In the case of gravity, heavy bodies fall and light bodies (for example, fire) naturally rise upward because of the presence of heaviness (*gravitas*) and lightness (*levitas*). These qualities are the primary efficient causes of the motions of bodies toward or away from the center of the world. As for magnetism, a lodestone has its capacity to attract iron because it possesses the "attractive quality" or "magnetic virtue," often explicitly referred to by Scholastic thinkers as an occult quality.[3]

By the mid- to late seventeenth century, explanations in terms of Aristotelian forms and qualities had become the object of both literary satire and philosophical critique. Molière effectively ridicules the

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which in turn affect the tiny bodies composing the sense organs with which they come into contact. Gravity is simply the result of the pushing of bodies against one another, with certain visible bodies being propelled downward by the motion of other, much smaller and less visible bodies moving in the opposite direction.[6]

For a Cartesian scientist, what makes these mechanistic models of scientific explanation possible is a fundamental dualist principle at the heart of Descartes's metaphysics.[7] The mind and the body, Descartes argues, are radically distinct and mutually exclusive things. These two substances have absolutely nothing in common, neither their underlying essences nor their "modes" or properties. Mind, or mental substance, is nothing but pure thought, an immaterial thing whose sole activity is thinking; its properties include only individual thoughts—that is, ideas (including sensations, concepts, and mental images) and acts of volition. Body, or material substance, is nothing but extension, or three-dimensional space. For a Cartesian, a body has only purely geometric properties—size, shape, and divisibility—along with mobility and impenetrability.[8] Bodies, therefore, cannot have characteristics proper to minds, such as thoughts or feelings, not even accidentally. They certainly cannot contain immaterial, soul-like forms or qualities that cause certain physical behaviors by endowing a body with a kind of mental activity (such as "seeking" its natural resting place). Only a human being, who, alone in nature, is a union of the two substances, is animate in the sense of having both a body and a mind, or soul (*anima*). The attributes and behaviors of all other bodies—even those of nonhuman animals—must be explained as an engineer might explain the workings of a machine. Whatever cannot be reduced to a function of the shape, size, motion, and impenetrability of material parts cannot belong to a body. By thus emptying the corporeal world of everything spiritual and ridding matter of what he saw as the magical, agent-like forms and qualities of Aristotelian philosophy, Descartes ensured that all the phenomena of physical nature, no matter how complex, would have a purely mechanistic—and, ultimately, mathematical—

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explanation. Everything in the natural world could be reduced to pieces of matter moving around and colliding with—and moving, dividing, adhering to and separating from—other pieces of matter.

Catholic theologians immediately understood the ramifications of this metaphysics of nature for their most cherished dogma. They worried about what mind-body dualism meant for the eternal fate of the soul, despite Descartes's insistence that there was no better way to secure the soul's immortality; and they worried about what such a materialistic picture of nature meant for the operation of divine providence in the world. What troubled Descartes's theological opponents above all else, however, were the implications his physics seemed to have for the miracle of the Eucharist. They did not see how Descartes's system could explain the real presence of Christ in the host at the moment of consecration. Indeed, they believed that Descartes's conception of bodily substance rendered transubstantiation impossible. According to the Aristotelian explanation long favored by the Church, the substance of the bread is literally replaced by the substance of the body of Christ, while the real accidents of the bread (its color, shape, taste, and aroma) miraculously remain without their natural underlying support (the matter and substantial form of the bread); this is why the host still looks and tastes and smells like bread even after the priest has consecrated it. But Descartes has eliminated such real accidents. The properties of any body are just modifications of its extension—its shape, size, and corpuscular texture—and are thus inseparable from it. If you take away the substance (extension) of the bread, then you necessarily take away its accidents, too.

Descartes himself, shy of engaging in theological disputes, was only reluctantly drawn into discussions about how his metaphysics was consistent with the Catholic dogma of the Eucharist.[9] He defended his conception of body by showing that he, no less than the Aristotelians, could account for the real presence of Christ in the host. He argued that since the body of Christ took on exactly the same extended features of the bread it replaced, it would affect the sense organs in pre-

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cisely the same way the bread did, and thus would have all the sensory *appearances* of the bread.[10] He was wisely cautious, however, and wanted to make sure that in these replies to his critics he said nothing that would cause him trouble with ecclesiastic authorities. To his friend the priest Marin Mersenne—who was preparing Descartes's *Meditations* for publication along with the objections that Descartes had had him solicit from various philosophers and theologians and with Descartes's replies to those objections—he wrote, "I am not yet sending you the last sheet of my reply to M. Arnauld, where I give an explanation of transubstantiation according to my principles, because I want first to read the Councils on this topic."[11]

Descartes's concern was justified. In 1663, his works were placed by the Catholic Church's Sacred Congregation for the Doctrine of the Faith on the Index Liborum Prohibitorum, or List of Prohibited Books, with the proviso that they be proscribed *donec corrigantur*, "until corrected." The Vatican authorities made no explicit mention of what needed correcting, and with Descartes already dead for thirteen years, there was little chance that any correcting would be done. Most scholars agree, however, that what gave the censors the greatest offense were Descartes's attempts to explain the Eucharist according to the principles of his mechanical philosophy.[12]

France, however, tended to resent ultramontane meddling in its affairs. Even the French clergy often took umbrage with Rome's centralized and authoritarian approach to disciplinary and doctrinal matters. The Sacred Congregation's prohibition did not have the force of law in the realm of Louis XIV, and had little effect on what did or did not get read and discussed among the literate elite of Paris.

Paris in 1672 was full of Cartesians. They dominated conversations in the fashionable salons of the aristocracy, lectured to learned societies, and performed experiments in private academies. There were Cartesians in the gatherings held regularly in the apart-

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ments of Madame de Sévigné—just as there had been in the circle that used to meet in the *hôtel* of the late Marquise de Sablé, where one of the more popular topics of conversation was the compatibility of Cartesianism with Eucharistic transubstantiation. And there were Cartesians teaching physics and metaphysics in some of the independent *collèges.*[13] Most worrisome of all to the philosophy's religious opponents were the Cartesians in the abbeys and priories that housed the regular clergy. The Benedictines, the Oratorians, and even the Jesuits harbored individuals with Cartesian sympathies, while the austere Jansenists at Port-Royal de Paris earned (quite undeservedly) a reputation for being "as devoted to Cartesianism as they are to Christianity."[14] Nevertheless, Cartesians were still a persecuted minority in the university faculties. The University of Paris, especially, was not a friendly environment for Descartes's ideas. But this was more than made up for by Descartes's enduring grip in nonacademic settings. As the great nineteenth-century historian of Cartesianism, Francisque Bouillier, notes of this period, "for more than a half-century, in France there did not appear a single book of philosophy, there was not a single philosophical discussion, that did not have Descartes as an object, whether it was for or against his system."[15]

Leibniz was well aware of all this Cartesian activity in the city and he sought out venues where he could engage Descartes's partisans. Unfortunately, he was too late for the weekly meetings presided over at the home of Jacques Rohault, the premier Cartesian physicist of the period. These *mercredis*, so called because they were held on Wednesdays, came to an end with Rohault's death in 1671 and were not revived until 1680, by Rohault's student and one of the leading Cartesians of the last quarter of the century, Pierre Sylvain Régis. And while Leibniz would have heard much talk about the new philosophy among the members of the Académie des Sciences, little of it would have been positive. One of the founding members of the Académie was Gilles Personne de Roberval, one of Descartes's most implacable foes—it was his place that Leibniz hoped to occupy after 1675, when

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Roberval died—and this royal institution was still rejecting Cartesian candidates for membership in the 1670s.

On the other hand, the residence of the Duc de Liancourt, a sumptuous *hôtel* on the rue de Seine with which Leibniz was familiar, functioned as a home to an active Cartesian circle, as did the Hôtel des Muses, where from 1671 to 1674 the Dutch radical Frans van den Enden conducted a literary and political salon at which Leibniz was occasionally present.[16] Van den Enden had been a Latin teacher to the young Baruch Spinoza when he was living in Amsterdam in the early 1650s, and was responsible for introducing the future philosopher to the works of Descartes and other progressive thinkers. Within just a few years of opening his Parisian establishment, however, Van den Enden was caught up in a plot to overthrow the king and establish a republican form of government in France. Because he was a foreigner and, more important, not of noble lineage, he was not granted the courtesy of beheading given to his French coconspirators but was hanged for his crime.

Leibniz took full advantage of his time in Paris to acquire as much information as he could on Descartes's life and thought. He visited Clerselier to gain access to Descartes's letters and manuscripts, which Clerselier had in his keeping, and spent many hours copying (and thus preserving for posterity) a good number of them. At this point in his life, however, Leibniz was highly eclectic, and his omnivorous mind was open to a plurality of philosophical orientations. He may have been fascinated by Cartesianism, but he also fell in with a number of opponents of the new philosophy. His Greek tutor, Huet, elected in 1674 to the Académie des Sciences, later composed one of the more severe contemporary philosophical critiques of Descartes, the *Censure of Cartesian Philosophy*. A skeptic himself, Huet regarded Descartes as a dogmatist whose fallacious reasoning in the *cogito ergo sum* argument and his "viciously circular" proof of God's existence undermined the entire project of the *Meditations*. Although as a young man Huet had been a great admirer of "the dazzling wonders brought forth" by the

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itations of Descartes; so far am I from being a Cartesian."[22] Even in Paris, and despite making the rounds of Cartesian society and acquiring a deep familiarity with its principles and personalities, it would be too much to say even that he flirted with becoming a member of "the Cartesian sect." While Leibniz had at one early point in his career "freed myself from the yoke of Aristotle,"[23] as he put it later in life, he quickly came to see that the mathematically spare picture of body propounded by Descartes needed to be supplemented by what he called "metaphysical entities." What he had in mind were the soul-like forms of the Scholastics.

Contrary to Descartes, Leibniz argues, physical bodies cannot be merely geometric beings, pure spatial extension in three dimensions. He had already arrived at this realization in Paris. "In the body there is something necessary besides extension," he wrote to Henry Oldenburg in December 1675. "The distinction between mind and matter is therefore not yet clear from the distinction between thought and extension."[24] If bodies were just bare spatial extension, then the phenomena of nature and the laws governing them would be very different from what they in fact are. Extension, because it is purely passive—subject only to modifications in shape, size, and motion understood kinetically—is incapable of grounding any of the dynamic features of bodies (such as elasticity). There is no room for any forces in Cartesian bodies, since the activity of such forces could not be explained in terms of extension and its modifications.[25] If Descartes were right, the smallest body would, upon impact with another body at rest, no matter how large, move the latter without the slightest loss in its own speed. Leibniz showed that Descartes's mistaken conception of matter had led him to fail to see that there is a distinction between force proper and mere quantity of motion, and that the true measure of force is the product of a body's mass and the square of its velocity, not the product of mass and speed.[26]

Moreover, if bodies were but parcels of extension, then there would be nothing substantial or real about them. Extension is by its

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nature divisible ad infinitum; any quantity of extension, no matter how small, can always be further divided—such is the nature of space. Purely geometrical bodies, then, would be only accidental collections of divisible, extended parts, each of which was itself only an accidental collection of divisible, extended parts, and so on. Such bodies would lack any real unity, a condition that Leibniz deems essential for being a true substance. "Since we can always go on in this way [of division], we would never reach anything about which we could say, here is truly a being."[27]

To account for the true behavior of bodies in nature, including their dynamic properties, and to ground the substantial reality of material things in an indivisible (because immaterial) active principle that unites its plurality of parts into an organic whole, Leibniz insists that there has to be in corporeal substances something besides extension, something "metaphysical" and not just geometrical. "This force is something different from size, shape, and motion, and one can therefore judge that not everything conceived in body consists solely in extension and in its modifications, as our moderns have persuaded themselves. Thus we are once again obliged to reestablish some beings or forms they have banished."[28] While Leibniz, unlike the Aristotelians, is careful to note that these forms should play no role in the explanations of phenomena offered within the confines of natural science, they are metaphysically necessary to understand *why* those explanations (and especially the laws that appear in them) are such as they are. "I believe that anyone who will meditate about the nature of substance . . . will find that the nature of body does not consist merely in extension, that is, in size, shape, and motion, but that we must necessarily recognize in body something related to souls, something we commonly call substantial form."[29]

> However, it is useless to mention the unity, notion, or substantial form of bodies when we are concerned with explaining the particular phenomena of nature . . . These

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