

HISTORICAL  
DICTIONARY  
OF

# LEIBNIZ'S Philosophy



STUART BROWN and N. J. FOX



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# Historical Dictionary of Leibniz's Philosophy

Stuart Brown  
N. J. Fox

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Philosophies, and Movements, No. 66*



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## Contents

Editor's Foreword	<i>Jon Woronoff</i>	vii
Preface		ix
Reader's Note		xi
Abbreviations		xiii
Photographs		xv
Chronology		xix
Introduction		xxvii
THE DICTIONARY		1
Appendix: Leibniz's Main Philosophical Writings		249
Bibliography		253
About the Authors		329



## Editor's Foreword

Gottfried Wilhelm Leibniz, who lived and worked three centuries ago, was one of the first modern philosophers. Though not all of his contributions would still find favor today, there is no doubt that they were striking and even pathbreaking for the time. And it is abundantly clear that without them philosophy and, even more so, mathematics, physics, and science in general would not be at their present state today. Leibniz's role as one of the great thinkers of his age was even more impressive considering how atypical he was in certain ways: eclectic when many clung desperately to fixed ideas, seeking reconciliation while others scorned their opponents, and optimistic in what was often a time of despair. Moreover, Leibniz was one of the last global thinkers, concerned not only with philosophy and science but also with art and statecraft, at home in, and writing for, both academic circles and the wider world. These are more than enough reasons to want to know more about his work.

*Historical Dictionary of Leibniz's Philosophy* is an excellent aid for such research, which in the case of Leibniz is much harder than for many others since he published so little during his lifetime and much of his work is still being published. The dictionary section describes the more significant writings, as well as the numerous concepts related to his philosophy, and it also includes entries on significant persons he was in contact with and places where he resided. The chronology traces his long career and also some sequels. But the introduction is obviously the place to start, with a broad overview of the man and his life, his writings, and his philosophy. The bibliography should not necessarily be the place to end, since this handy volume can help in studying the more specialized or advanced literature. As Leibniz's philosophy cannot be separated from his many other interests—such as science and law, mathematics and theology—the dictionary is not restricted purely to

philosophy but touches upon the many other interests of an intriguing and multifaceted personality.

This volume was written by Stuart Brown and N. J. Fox. Dr. Brown has had a long and fruitful career, starting at the University of St. Andrews in 1963 and more recently serving as professor of philosophy at the Open University, where he has now been elected an emeritus professor. He has written extensively on Leibniz, including the early book *Leibniz* in the *Philosophers in Context* Series. He has also edited and translated Leibniz's *Discourse on Metaphysics* and edited the collection of papers *The Young Leibniz and His Philosophy, 1646–1676*. N. J. Fox, Stuart Brown's last postgraduate student, wrote his thesis on the influence of kabbalistic mysticism on Leibniz's cosmology. Dr. Fox also contributed several entries to the *Dictionary of Twentieth-Century British Philosophers*, edited by Dr. Brown. This historical dictionary was a cooperative venture between teacher and former student in the interest of making the philosophy of Leibniz, and Leibniz the person, better known in wider circles.

Jon Woronoff  
Series Editor

## Preface

It is often said of Leibniz that he was a walking encyclopedia, and indeed it would take an encyclopedia to do justice to the range of his interests and activities. He was a librarian, diplomat, courtier, historian, economist, lawyer, mathematician, physicist, theologian, philologist, inventor, and logician as well as a philosopher. It would require the collaboration of scholars from a wide range of disciplines to produce such an encyclopedia, which would extend several volumes.

What we have sought to do in this dictionary is something rather less ambitious. But it is not without ambition, given the scope of Leibniz's interests in philosophy and adjacent subjects. We touch on some of Leibniz's interests outside philosophy but we do so only because and insofar as they have a bearing on his philosophy. We do not, for instance, go into the details of his contributions to technical subjects such as mathematics, logic, and physics. But these subjects all have a bearing on his philosophy. So we have some entries on topics such as the infinitesimal calculus, logic, and dynamics.

The dictionary is about Leibniz's philosophy and not about Leibnizianism. We have entries on earlier philosophers because we have judged them to be relevant to understanding Leibniz's philosophy. We decided, partly because of limitations of space, not to have entries on later philosophers. We have, however, gone beyond Leibniz's lifetime in the chronology, outlining the history of the posthumous publication of Leibniz's works. There are also sections on the reception of Leibniz's philosophy and on Voltaire and Kant in the bibliography.

It is surprising, in our view, that this is the first dictionary of Leibniz's philosophy, for that philosophy lends itself unusually well to presentation in a dictionary format. Leibniz's philosophy can seem very diffuse, but it is interconnected to a great extent with apparently diverse topics leading into one another. There is, moreover, no one route that

everyone must take into Leibniz's philosophy. It is possible, on the contrary, to enter at any of a large number of points and be led from it to others, soon forming a picture of the whole. The dictionary thus provides one kind of introduction to Leibniz's philosophy. It has been written with the nonspecialist in mind. So, though the entries are written concisely, they do not presuppose a prior knowledge of Leibniz nor indeed more than a passing knowledge of philosophy.

We have drawn on a number of sources to help us choose the topics on which there should be entries: indexes to Leibniz editions, lexicons of Leibniz's philosophy, topics on which other scholars have written, and so on. Lloyd Strickland and Pauline Phemister commented most helpfully on lists of topics for which entries were intended. In the end, of course, we ourselves have had to make judgments about what was more central and what more marginal, acknowledging that others would make slightly different judgments.

We have both been involved in every part of the work. Stuart Brown, however, has been working on the project longer and, as a result, has written more of the entries. N. J. Fox has written most of the introduction, as well as the chronology, and negotiated the permissions for the visual materials that are included. We are grateful to Lloyd Strickland for reviewing the dictionary entries at a late draft stage. We are also grateful to Jon Woronoff, the series editor, for his constant support and advice.

## Reader's Note

In the case of terms or phrases used technically by Leibniz, the most commonly employed English words are used. The original-language terms (usually Latin or French, in that order) are given in brackets. These could be used to search the indexes of original-language editions, lexicons, or texts that are available in electronic form.

Related entries are indicated in bold type in the text or mentioned at the end of each entry. Reading a cluster of related entries should provide a larger view of Leibniz's opinions on particular themes or of his connection with another thinker. The reader should also find that there are related headings in the bibliography that will refer to relevant secondary literature on the topic.

Though we have sought not to clutter the entries with textual references, we have given sources, where appropriate, making reference both to the best available original-language edition and, where possible, an accessible English-language edition of Leibniz's writings. Where we have quoted Leibniz, we have normally used our own translation, giving the original-language source first and then, in most cases, an English-language edition where the reader can look up the context of the quotation. Where we have used an existing English translation, we have reversed the order, giving the English-language source we have used first.

The editions of Leibniz's writings are referred to by a common system of abbreviation given at the beginning of the book. In the case of some of Leibniz's major writings, including the *Discourse on Metaphysics*, the *Theodicy*, and the *Monadology*, there are many editions but all share a system of numbering by sections. In these cases we have referred only to the sections. In the case of the *New System*, we have used paragraph numbers, although not all editions carry these. A number of important English-language editions of Leibniz's writings—notably Remnant and Bennett's edition of the *New Essays* and Parkinson's

*en-face* edition of the *De summa rerum*—conveniently adopt the pagination of the Akademie edition. In these cases we have given only the Akademie edition page reference.

Each of Leibniz's major philosophical writings—as well as a selection of minor ones—has an entry in its own right here. An appendix lists them together under several heads and gives fuller details of where good editions are to be found.

The dictionary is arranged alphabetically by the main word of the entry (as in COMBINATIONS, ART OF), the surname in the case of most names (e.g., ARNAULD, ANTOINE), and the first main word in the case of titles of works (e.g., *NEW SYSTEM*). Where it is not obvious which is the main word or where there is more than one way of referring to a topic, we have included a “blind” cross-reference: for example, IDENTITY OF INDISCERNIBLES. *See* INDISCERNIBLES, IDENTITY OF.

## Abbreviations

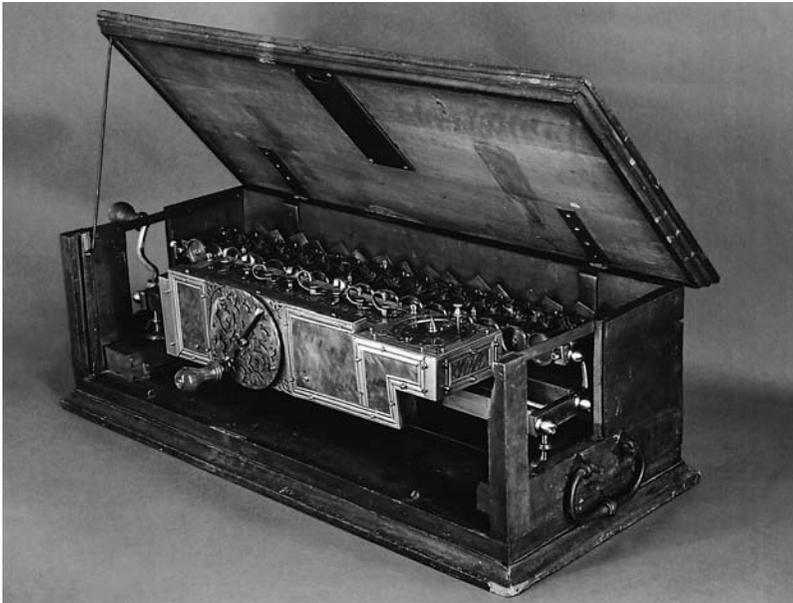
References to editions and collections of Leibniz's works are given in an abridged form, without publication details, which are to be found in the bibliography. In addition the following abbreviations have been used:

- A** German Academy of Sciences (auspices). *G. W. Leibniz: Sämtliche Schriften und Briefe*. Berlin: Akademie Verlag, 1923–. (Referred to by series and volume number.)
- AG** Ariew, Roger, and Daniel Garber, trans. and eds. *G. W. Leibniz: Philosophical Essays*. Indianapolis, Ind.: Hackett, 1989.
- Ar** Ariew, Roger, ed. *G. W. Leibniz and Samuel Clarke: Correspondence*. Indianapolis, Ind.: Hackett, 2000.
- BC** Buchenau, Arthur, and Ernst Cassirer, eds. *G. W. Leibniz Hauptschriften zur Grundlegung der Philosophie*. 2 vols. Leipzig, 1924. Reprint, Hamburg, 1966.
- C** Couturat, Louis, ed. *Opuscules et fragments inédits de Leibniz*. Paris: Alcan, 1903. Reprint, Hildesheim: Olms, 1961.
- D** Dutens, Ludovico L., ed. *G. G. Leibnitii . . . Opera omnia*. 6 vols. Geneva, 1768. Reprint, Hildesheim: Olms, 1989.
- E** Erdmann, J., ed. *Leibnitii opera philosophica quae exstant latina, gallica, germanica omnia*. Berlin, 1840.
- GM** Gerhardt, Carl I., ed. *Leibnizens mathematische Schriften*. 7 vols. Berlin: A. Asher/Halle: H. W. Schmidt, 1849–1863. Reprint, Hildesheim: Olms, 1965.
- GP** Gerhardt, Carl I., ed. *Die philosophischen Schriften von Gottfried Wilhelm Leibniz*. 7 vols. Berlin: Weidmann, 1875–1890. Reprint, Hildesheim: Olms, 1965.
- Gr** Grua, Gaston, ed. *G. W. Leibniz: Textes inédits d'après les manuscrits de la Bibliothèque provinciale d'Hanovre*. Paris: Presses Universitaires de France, 1948.

- Gu** Guhrauer, G. E., ed. *Leibniz's deutsche Schriften*. 2 vols. Berlin, 1838–1840.
- H** Huggard, E. M., trans. *Theodicy: Essays on the Goodness of God, the Freedom of Man and the Origin of Evil*, by G. W. Leibniz. London: Routledge & Kegan Paul, 1951.
- K** Klopp, Otto, ed. *Die Werke von Leibniz*. 11 vols. Hanover: Klindworth, 1864–1884.
- L** Loemker, Leroy E., ed. and trans. *G. W. Leibniz: Philosophical Papers and Letters*. 2nd ed. Dordrecht: Reidel, 1969.
- La** Langley, Alfred G., ed. *New Essays Concerning Human Understanding*. New York: Macmillan, 1896 (2nd ed., 1916).
- M** Mollat, G., ed. *Rechtsphilosophisches aus Leibnizens ungedruckten Schriften*. Leipzig, 1885.
- MB** Martin, R. N. D., and Stuart Brown, eds. and trans. *G. W. Leibniz: Discourse on Metaphysics and Related Writings*. Manchester: Manchester University Press, 1988.
- PW** Parkinson, G. H. R., ed. and trans. *Leibniz: Philosophical Writings*. London: Dent, 1973.
- R** Riley, Patrick, ed. and trans. *The Political Writings of Leibniz*. Cambridge: Cambridge University Press, 1972 (2nd ed., 1988).
- Ru** Russell, C. W., ed. and trans. *System of Theology*. London: Burns & Lambert, 1850.
- SM** Schrecker, Paul, and Anne Martin, eds. and trans. *Leibniz: Monadology, and Other Philosophical Essays*. Indianapolis, Ind.: Bobbs-Merrill, 1965.
- W** Wiener, Philip P., ed. *Leibniz: Selections*. New York: Scribner, 1951.
- WE** R. S. Woolhouse, and Richard Franks, eds. and trans. *Leibniz's "New System" and Contemporary Texts*. Oxford: Clarendon Press, 1997.



*Image 1* Gottfried Wilhelm von Leibniz (1646–1716). Courtesy of Niedersächsische Landesbibliothek, Hanover



*Image 2 The only surviving Leibnizian calculating machine. Designed to multiply, divide, and add, Leibniz's calculating machine was a considerable advance on earlier models. In 1673, mainly as a result of a demonstration of his machine, Leibniz was elected a member of the Royal Society of London. Through his idea of a "universal characteristic," in which thoughts would be assigned numbers, Leibniz hoped that one day a more sophisticated calculating machine would lead to the mechanization of reasoning itself. Courtesy of Niedersächsische Landesbibliothek, Hanover*





*Image 4 The Leibnizhaus, Hanover. Leibniz took charge of the electoral library in 1676, a post he held for 40 years. In 1698 the library was installed in the building known today as the Leibnizhaus, in which the philosopher occupied an apartment. The original Leibnizhaus was destroyed on 9 October 1943 in an air raid. Rebuilt in the late 1970s, it functions today as a conference center and guesthouse for the University of Hanover. The library and the Leibniz archive are to be found a few streets away. Courtesy of Leibnizhaus, Universität Hannover*

# Chronology

*Note:* Dates are given according to the Gregorian calendar.

- 1646** **1 July:** Born in Leipzig, the son of Friedrich Leibniz (1597–1652), professor of moral philosophy at the University of Leipzig.
- 1648** End of the Thirty Years War.
- 1650** Death of René Descartes.
- 1651** Publication of Thomas Hobbes's *Leviathan*.
- 1652** Leibniz's father dies, leaving him to be brought up by his mother.
- 1653** Enters the Nicolai School in Leipzig.
- 1661** Enters the University of Leipzig. His teachers include Jakob Thomasius and Johann Scherzer.
- 1663** Defends and publishes his bachelor's thesis, *Metaphysical Disputation on the Principle of Individuation*. Attends some lectures by Erhard Weigel at the University of Jena.
- 1664** Defends and publishes his master's thesis on philosophy of law, entitled *Specimen quaestionum philosopharum ex jure collectarum*. His mother dies.
- 1665** Studies law and receives his bachelor's degree.
- 1666** Publishes *Dissertation on the Combinatorial Art*. Writes his doctoral thesis in law, *On Difficult Cases in Law*, but the degree is refused by Leipzig. Moves to the University of Altdorf.
- 1667** Receives doctorate in law from Altdorf. Takes a position as secretary to an alchemical society in Nuremberg. Moves to Frankfurt and publishes his *New Method for Learning and Teaching Jurisprudence*.
- 1668** Moves to Mainz, where he is appointed to the High Court of Appeal by the elector. Catalogs the library of Baron Johann

- Christian von Boineburg. Writes an anonymous tract supporting the elector's candidate to be king of Poland.
- 1669** Engages in ecclesiastical diplomacy and in writing about theology and philosophy of religion, including the drafts known as *The Catholic Demonstrations*. Publishes anonymously his *Confession of Nature against the Atheists*.
- 1670** Produces for Boineburg an edition of Nizolius's *Anti-Barbarus*, with a preface. Works on physics and studies Hobbes. Writes his only letter to Athanasius Kircher, whose works he had read and admired.
- 1671** Publishes anonymously the *New Physical Hypothesis*.
- 1672** Goes to Paris on a secret diplomatic mission to present a peace plan for Europe. Meets Antoine Arnauld and Christiaan Huygens. Boineburg dies. His sister, Anna Catherina, dies.
- 1673** Travels to London in hope of setting up a peace conference. Meets Henry Oldenburg, secretary of the Royal Society, and Robert Boyle. Demonstrates a model of his calculating machine (see image 2). Elected a fellow of the Royal Society in London. The elector of Mainz dies. Leibniz returns to Paris and begins intensive study of higher mathematics. Writes *Confession of a Philosopher*.
- 1674** Working on mathematical problems and on completing his calculating machine.
- 1675** Makes a breakthrough with the infinitesimal calculus. Meets Nicolas Malebranche and Ehrenfried Walther von Tschirnhaus. Begins a 20-year correspondence with French cleric Simon Foucher. Begins the writings that form the *De summa rerum*.
- 1676** Decides to accept employment with Johann Friedrich, Duke of Hanover. First (indirect) exchange of letters with Isaac Newton. Travels via London to Holland where he visits the microscopists Jan Swammerdam and Antoni van Leeuwenhoek in Amsterdam and Delft, and Benedict de Spinoza at The Hague. **December:** Arrives in Hanover.
- 1677** Publishes the diplomatic work *De jure suprematis*. Second exchange of letters with Newton. Spinoza dies.
- 1678** Receives a copy of Spinoza's *Ethics*. Continues work on the universal characteristic.
- 1679** Begins his involvement in the Harz mine-draining scheme. Begins a 23-year correspondence with Jacques Bénigne Bossuet,

- later to become bishop of Mieux, and a long correspondence with Ernst von Hessen Rheinfels. Johann Friedrich dies and his dukedom passes to Ernst August, whose wife Sophie and later their daughter Sophie-Charlotte become Leibniz's trusted friends and correspondents. Hobbes dies.
- 1682** Publishes the first of about 50 articles in the *Acta Eruditorum*.
- 1684** Publishes *New Method for Maxima and Minima* and *Meditations on Knowledge, Truth, and Ideas*.
- 1685** His involvement in the Harz mine projects ends. Researching the history of the House of Brunswick-Lüneburg becomes his principal official duty. Birth of George Berkeley.
- 1686** Completes the first draft of the *Discourse on Metaphysics*. Correspondence with Arnauld begins. Publishes *Brief Demonstration of a Notable Error of Descartes*.
- 1687** Leaves Hanover on a journey that takes him, over the next three years, to southern Germany, Austria, and Italy, officially researching the history of the House of Brunswick. Begins a 10-year correspondence with professor of mathematics Jakob Bernoulli. Publication of Newton's *Principia*.
- 1688** Meets the Kabbalah scholar Christian Knorr von Rosenroth in Sulzbach. Conducts numerous trips and meetings in furtherance of his interests in geology, mineralogy, and natural history.
- 1689** Publishes *Schediasma de resistentia* and *Tentamen de motuum coelestium causis*.
- 1690** Returns to Hanover. Corresponds with Paul Pellison-Fontanier on issues of church reunion. First uses the term *monad*, in a letter to Michel Angelo Fardella. Publication of John Locke's *Essay Concerning Human Understanding*.
- 1691** Takes up the directorship of Wolfenbüttel Library. Finishes *Dynamics*.
- 1692** Begins correspondence with Guillaume de l'Hôpital on mathematics.
- 1693** Exchanges letters directly with Newton. Begins correspondence on mathematics with Johann Bernoulli that lasts until Leibniz's death. Publishes *Code of the Law of the Peoples (Codex juris gentium diplomaticus)*.
- 1695** Publishes part 1 of *Specimen of Dynamics* and *New System of the Nature of Substances*.

- 1696** Carries on conversations with Christian kabbalist Francis Mercury van Helmont, whose *Thoughts on Genesis* Leibniz is secretly involved with. Pierre Bayle publishes his remarks on the *New System* in his *Dictionnaire historique et critique*. Leibniz proposes marriage, but then rescinds the offer.
- 1697** Writes *On the Radical Origination of Things*. Corresponds with Joachim Bouvet on Chinese philosophy and binary notation. Priority dispute concerning the discovery of the calculus begins.
- 1698** Ernst August dies and is succeeded by Georg Ludwig, with whom Leibniz has a troubled relationship. Publishes *On Nature Itself*. Corresponds with Burkhard De Volder on dynamics and metaphysics.
- 1700** Founding of the Berlin Society of Sciences, with Leibniz as the first president. He is also elected a foreign member of the Royal Academy of Sciences in Paris.
- 1701** Joins in negotiations concerning Georg Ludwig's accession to the English throne following the Act of Settlement. Begins correspondence on mathematics with Pierre Varignon.
- 1702** Debates with John Toland in the presence of Sophie-Charlotte in Berlin.
- 1704** *New Essays Concerning Human Understanding* is mostly complete. Begins a correspondence on mathematics with Jakob Hermann. Meets Princess Caroline of Ansbach. Locke dies.
- 1705** Makes first contact with mathematician Christian Wolff. Mourns the death of Sophie-Charlotte. Publishes *Thoughts on Vital Principles and Plastic Natures*.
- 1706** Meets and subsequently corresponds with Bartolomaeus Des Bosses, a Jesuit philosopher, mathematician, and theologian. Secretly composes, prints, and circulates a letter for Sir Rowland Gwyne advancing the case of the Hanoverian succession; the letter is condemned by Parliament.
- 1710** Publishes *Theodicy* anonymously. Publication of Berkeley's *A Treatise Concerning the Principles of Human Knowledge*.
- 1711** First of several audiences with Tsar Peter the Great, who commissions him to propose reforms of the law and the administration of justice in Russia. Birth of David Hume.

- 1712** Second edition of *Theodicy* is published with Leibniz's name. Royal Society makes the pronouncement that Newton discovered the calculus first.
- 1713** Appointed an Imperial Privy Counsellor in Vienna and establishes plans for a Society of Sciences there.
- 1714** Composes the *Principles of Nature and Grace, Founded on Reason* and the *Monadology* (see image 3). Begins correspondence with Nicolas Remond, a French Platonist. Sophie dies. Georg Ludwig ascends the English throne as George I. Leibniz returns to Hanover.
- 1715** Starts correspondence with Samuel Clarke, via Princess Caroline. Malebranche dies.
- 1716** Writes the *Discourse on the Natural Theology of the Chinese*. Discusses with Daniel Jablonski proposals for reunifying the Anglican and Lutheran churches. **14 November:** Leibniz dies, at age 70. **14 December:** Funeral and burial at Neustädter church. All his papers are taken into care by the Electoral Library.
- 1717** Clarke publishes his correspondence with Leibniz.
- 1718** *Principles of Nature and Grace, Founded on Reason* is published in *L'Europe savante*. J. Feller publishes Leibniz's 1696–1698 correspondence.
- 1720** *Monadology* is first published, in German translation, by Heinrich Koehler.
- 1721** First Latin translation of *Monadology*, by M. G. Hansch, is published in *Acta Eruditorum Supplementa*. Wolff publishes his *Vernuenfftige Gedancken von Gott*; his teachings are associated by many with Leibniz's for about a hundred years hence.
- 1723** Church historian Joachim Lange attacks Wolff and Leibniz in his *Kontroversschriften gegen die Wolffische Metaphysik*. G. Bilfinger publishes a defense of Leibniz's preestablished harmony in his *De Harmonia animi et corporis humani*.
- 1734** G. Kortholt publishes Leibniz's correspondence over the next eight years.
- 1737** C. Ludovici publishes a catalog of Leibniz's known works. The Jesuit journal *Mémoires de Trevoux* reviews the *Theodicy*, but is undecided regarding its possible Spinozism.

- 1745** J. M. Bousquet publishes Leibniz's correspondence with Johann Bernoulli. J. E. Kapp publishes an edition of Leibniz's German writings, including the correspondence with Jablonski.
- 1749** C. L. Scheidt publishes the *Protogaea*, in Latin and German.
- 1758** Voltaire writes *Candide*, in which he satirizes Leibnizian optimism.
- 1765** R. E. Raspe publishes his seven-volume *Oeuvres philosophiques*, which includes, for the first time, the *New Essays*.
- 1768** Ludovici Dutens publishes his six-volume *Opera omnia*. The Prussian Academy of Sciences offers a prize for the best essay in defense of Leibniz.
- 1769** Immanuel Kant reads the *New Essays*.
- 1776** J. A. Eberhard publishes *Allgemein Theori*, a reconstruction of Leibniz's work, based on the *New Essays*, and revives scholarly interest.
- 1797** Friedrich Schelling praises Leibniz in *Ideas toward a Philosophy of Nature*.
- 1781** Publication of Kant's *Critique of Pure Reason*, in which apparent refutations of Leibniz are probably more an attack on Wolff's doctrines.
- 1790** Kant provides his fullest treatment of Leibniz in his "What Real Progress Has Metaphysics Made in Germany since the Time of Leibniz and Wolff?"
- 1838** G. E. Guhrauer publishes Leibniz's German writings in two volumes.
- 1840** J. E. Erdmann publishes a three-volume series, including, for the first time, the *Monadology* in the original French and *On the Radical Origination of Things*.
- 1843** Georg Pertz publishes *Leibnizens gesammelte Werke* in four volumes over the next four years.
- 1846** L. Grotefend publishes for the first time the *Correspondence with Arnauld* and the *Discourse on Metaphysics*.
- 1847** George Boole publishes his *Mathematical Analysis of Logic*, reinventing much of the mathematical logic developed by Leibniz.
- 1849** Carl Gerhardt begins publishing his seven-volume *Leibnizens Mathematische Schriften* over the next 14 years.

- 1854** Alexandre Foucher de Careil publishes *Refutation inédite de Spinoza par Leibniz* and *Lettres et opuscules inédits de Leibniz*.
- 1856** Hermann Lotze publishes *Microcosmus*, in which Leibnizian principles are modified by the influence of Kant.
- 1857** Foucher de Careil publishes *Nouvelles lettres et opuscules inédits de Leibniz*.
- 1859** Foucher de Careil publishes *Oeuvres de Leibniz* in six volumes over the next six years, with a seventh volume in 1875.
- 1864** O. Klopp publishes Leibniz's historical and political works in 11 volumes over the next 20 years.
- 1875** Gerhardt begins publishing Leibniz's philosophical writings in seven volumes over the next 15 years.
- 1879** Frege publishes his *Begriffsschrift*, a project that he acknowledges was begun by Leibniz.
- 1890** First English edition of Leibniz's works by G. M. Duncan.
- 1898** Robert Latta publishes *Leibniz: "Monadology" and Other Philosophical Writings*.
- 1900** Project to publish the entire Leibnizian corpus is conceived by the Prussian and French academies. Edmund Husserl pays tribute to Leibniz's work on logic in his *Logische Untersuchungen*. Bertrand Russell publishes *The Philosophy of Leibniz*.
- 1903** Louis Couturat publishes *Opuscules et fragments inédits de Leibniz*.
- 1923** First volume of *G. W. Leibniz: Sämtliche Schriften und Briefe* is published; volumes are still forthcoming.
- 1943** **9 October:** Leibnizhaus is destroyed in an air raid.
- 1948** Gaston Grua publishes *Textes inédits*.
- 1956** Leroy Loemker publishes *G. W. Leibniz: Philosophical Papers and Letters*.
- 1983** Leibnizhaus's reconstruction is completed and it is opened as a conference center and guesthouse (see image 4).



## Introduction

Between 1618 and 1621 the struggle between the Protestant and Catholic peoples of Europe entered its decisive phase with the outbreak of the Thirty Years War. The military conflict, which began in the Holy Roman Empire, was eventually to spill over and engulf most of the continent in the most devastating war of the early modern period. At its cessation, Germany was ruined, its hundreds of small states united by little more than allegiance to the emperor. Worse still, Christendom, as a political force uniting Europe against the Turks, was left severely undermined. The only power capable of preserving Christendom against the “barbarians” was France, but in the eyes of the other nations of Europe, France itself posed a threat to their own sovereignties.

In 1646, in the midst of this religious and political mayhem, a boy was born in Leipzig who would go on to become a polymath without equal in modern times. He would correspond with most of the leading thinkers of the period—leaving behind no less than 15,000 copies of his own letters; he would make significant contributions in philosophy, mathematics, logic, physics, theology, politics, law, philology, history, and economics; and he would become the father of modern German philosophy.

Gottfried Wilhelm von Leibniz was born on 1 July 1646 (new style) to Friedrich Leibniz, a professor of moral philosophy at the University of Leipzig, and his third wife, Catherina. Following the death of his father when he was only six years old, Leibniz, with his younger sister Anna Catherina, was raised by his mother. She died when Leibniz was still at university, and his sister was only 24 when she died.

It seems that Leibniz proposed marriage when he was 50, but whoever the lady was, she spent long enough considering the idea for Leibniz to change his mind. But he always enjoyed the company of women, particularly aristocratic ones. From the age of about 33 he got to know

Sophie, the electress of Hanover, wife of his then employer. This relationship grew over many years into one of mutual trust, and she had a keen and genuine interest in his philosophical thoughts. Her daughter, Sophie-Charlotte, later to become queen of Prussia, shared her mother's admiration of Leibniz. He seems to have become very fond of Sophie-Charlotte, for her early death left him feeling badly bereft. Later in life, through Sophie, he developed a friendship with Princess Caroline of Ansbach, who became Princess of Wales when she married Sophie's grandson and later queen of England. All these women took a keen interest in Leibniz's philosophical work and often acted as intermediaries facilitating correspondence or meetings between Leibniz and other thinkers.

Leibniz certainly found the company of other people agreeable. He was said to be very self-assured and open to all kinds of opinions, generally concerned to get at what was best in each, though he did not suffer fools gladly. As a scholar, he was known to work for weeks on end, rarely leaving his study, working on into the night and rising late and taking his meals at his desk. Once begun on a project he had great difficulty giving it up, even when it seemed a hopeless task. He liked traveling and did a lot of it, even designing a coach that would enable him to write in it.

Physically he was a man of medium height and slim build, with a largish head and small, intense eyes. By refusing to modernize his appearance, his huge cascading wigs, which had been in fashion during the years he spent in Paris, and his unfashionably ornate clothes lent him an eccentricity in later years. His refusal to attend church made him unpopular with the court and the local clergy, who dubbed him "Lövenix"—believer in nothing.

Leibniz died on 14 November 1716, aged 70, after a week in bed suffering from gout and colic. A month later he was given a funeral and burial at Neustädter church, Hanover. No one from court attended.

## CAREER OF LEIBNIZ

When Leibniz was eight years old he was allowed access to his father's library. Here, by his own account, he read—or tried to read—the works of the ancients, including Plato and the Church Fathers, Augustine and

Thomas Aquinas. At the Nicolai School in Leipzig, he would have been taught Latin, Greek, theology, German history and literature, and logic. It was here, he says, that he discovered Aristotle and became fascinated with his discussions of logic and the categories.

At the age of 15 he entered the University of Leipzig—not that unusual an age for the time. For the first two years he studied philosophy, natural philosophy, mathematics, rhetoric, Latin, Greek, and Hebrew. He decided to abandon explanation by substantial forms and adopt instead the mechanism of the “Moderns”: he read Francis Bacon, Pierre Gassendi, Girolamo Cardano, Tommaso Campanella, Johannes Kepler, Galileo Galilei, and René Descartes. But from his two most important teachers at Leipzig, Jakob Thomasius (1622–1684) and Johann Scherzer (1628–1683), Leibniz learned an eclectic approach, which established itself in him as a lifelong disposition for harmonizing otherwise contradictory points of view. Leibniz was attracted to the infusion of Christian theology into scholastic philosophy and was strongly influenced by Aquinas and Francisco Suárez (1548–1617). Thomasius, however, argued that the scholastics had distorted Aristotle, and he encouraged Leibniz to read Aristotle’s original writings. In 1663 Leibniz defended a bachelor’s thesis entitled *Metaphysical Disputation on the Principle of Individuation*. This was supervised by Thomasius, and it dealt with some problems of scholastic Aristotelianism.

Leibniz spent the summer of this year at the University of Jena. Here he attended some lectures by professor of mathematics Erhard Weigel (1625–1699). Weigel was keen to reconcile the ancient with the Modern philosophy—an approach that became central to Leibniz’s later work. He also read the “Herborn encyclopedists” Johann Alsted (1588–1638) and Johann Bisterfeld (1605–1655). Their works inspired him to read the *Ars magna* of Ramon Lull (c. 1232–1316), which in turn stimulated his first meditations on a universal science, resulting two years later in his essay *Dissertation on the Combinatorial Art*.

In 1664 he defended a master’s thesis in philosophy of law, entitled *Specimen quaestionum philosophiae ex jure collectarum*, and subsequently he decided to study law, gaining a bachelor’s degree in that subject in the following year. In 1666 Leibniz wrote a doctoral thesis in law, *On Difficult Cases in Law*, but the degree was refused, apparently on the grounds that he was too young. The University of Altdorf, however, was prepared to confer the degree.

Apart from being one of the greatest intellectuals of his age, Leibniz held at various times throughout his life—often at the same time—the posts of diplomat, lawyer, librarian, historian, mining engineer, and inventor. As well as conferring a doctor's degree on him, the University of Altdorf also hinted that an offer of a professorship could soon be made to him. But he declined this, opting instead for the life of a man of practical affairs. His first job was as secretary to an alchemical society in Nuremberg, a position he may have secured while still at Altdorf. His fortuitous meeting with Baron Johann Christian von Boineburg (1622–1672), a minister for the elector of Mainz, soon led to him taking a post as assistant to the legal advisor to the elector. Later, he was appointed assessor at the High Court of Appeal. At the same time, he took on the work of cataloging Boineburg's library, instigating a classification system by subject, something that only the Bodleian Library had done by that time. One of Leibniz's tasks for the elector was to produce a document supporting the elector's candidate for the throne of Poland.

From 1667 until 1671 Leibniz was primarily engaged in legal work. Out of this came a number of essays on law. Boineburg was an important influence on Leibniz at this time. Both men were concerned to do what they could to heal the catastrophic rift between Protestants and Catholics. Boineburg encouraged Leibniz to apply himself to writing philosophical tracts to this end, one result of which is the *Catholic Demonstrations* (1668–1671). In 1669, he wrote an essay on the philosophy of religion, entitled *Confession of Nature against the Atheists*, in which he attempts to prove the existence of God and the immortality of the soul. In 1670, also at the request of Boineburg, Leibniz published his first book on philosophy, an edition of *Anti-Barbarus* (1553) by the humanist Marius Nizolius (1498–1576), to which he wrote the preface and added textual notes. In 1671 he published the *New Physical Hypothesis*, the result of his first serious study of physics.

One of Boineburg's most important influences on Leibniz was to put the young man in touch with Antoine Arnauld (1612–1694), the famous theologian and philosopher. And it was Boineburg who was responsible for the crucial next stage in the development of Leibniz's thought when he dispatched him to Paris in 1672, at the age of 26, on a secret diplomatic mission. The trip actually came about due to a plan that Leibniz had devised himself, in which the French were to be enticed into invading Egypt in order to deflect the ambitions of Louis XIV away from

the German lands. Following the outbreak of war, Leibniz traveled to London with the aim of setting up a peace conference there. While in London he met Robert Boyle (1627–1691) and became acquainted with Henry Oldenburg (1618?–1677), the secretary of the Royal Society. Leibniz demonstrated the prototype of a mechanical calculator he had built to a group of members of the Society. This device (*see* image 2) could perform multiplication and division and was an important improvement on Pascal's earlier machine, which could only do addition and subtraction. As a result of this and his *New Physical Hypothesis*, Leibniz was elected a member of the Royal Society in April 1673.

Leibniz's first stay in London was cut short by news of the death of Boineburg, and he returned to Paris in March 1673. For the next three years, he spent some of his time acting as tutor to Boineburg's son, who was resident there; otherwise he pursued his intellectual interests, designing a compressed-air machine, an underwater ship, and an aneroid barometer. Through acquaintanceship with the Cartesian philosophers Arnauld and Nicolas Malebranche (1638–1715), Leibniz gained access to the unpublished writings of Descartes and Pascal. Indeed, some of Descartes's works are only extant because of copies made of them by Leibniz at this time. Leibniz also became friendly with the anti-Cartesian cleric Simon Foucher (1644–1696). For the next 20 years, long after he had left Paris, Leibniz kept in touch with Foucher, maintaining him as his contact in that city.

From 1672 to 1673 Leibniz worked on *Confession of a Philosopher*, which concerns what he would later call *theodicy* and includes discussions on whether there can be free will in a world where all contingents are determined by the principle of sufficient reason and whether punishment in such a world can be justified.

In 1673, under the tutelage of Christiaan Huygens (1629–1695), Leibniz applied himself zealously to improving his mathematics. As a result, by 1675 he had made most of the discoveries that were later to earn him a place in the history of that subject, in particular, his development of the calculus. From 1675 to 1676 Leibniz wrote a series of metaphysical papers, known as *De summa rerum*. This represents his first attempt at a systematization of his philosophy and contains several principles that remained a key feature of his mature works.

Leibniz tried to secure a research fellowship at the Paris Académie des Sciences, but to no avail. In the end, with no better prospects available,

he accepted the post of councilor and head librarian at the Court of Hanover, under Duke Johann Friedrich (1625–1679). In taking up his new posts, Leibniz traveled via Holland, where he met the pioneering microscopists Antoni van Leeuwenhoek (1632–1723) and Jan Swammerdam (1628–1660) in Delft and Amsterdam. More significantly, he spent four days in The Hague in talks with Benedict de Spinoza. In December 1676, now age 30, Leibniz took up his employ at the Court of Hanover, in which he would remain, under successive dukes, for the rest of his life. His duties, over the years, embraced the cultural, the scientific, the historical, and the politico-legal. He was put in charge of the state libraries, called upon to give advice and produce tracts relating to legal and political issues, and assigned to lengthy specific projects such as mining engineering and genealogical research. Whenever he found the time, he continued his philosophical studies, writing essays, corresponding with his many contacts, and developing the philosophical system that had begun to take shape in Paris.

From 1679 to 1685 Leibniz spent much of his time working as an engineer at some silver mines in the Harz mountains. He was responsible for designing and implementing wind-powered pumps for draining the mines. But despite his tenacity, the scheme was never successful. At this time he also produced designs for other aspects of mining technology; for the manufacture of steel, porcelain, and glass; and for a canal system and water desalination plant.

From the late 1670s through the 1680s Leibniz wrote essays on logic and universal language and developed his concept of truth. In 1686 he wrote the *Discourse on Metaphysics* and sent a summary of it to Arnauld, via Ernst, the landgrave of Hessen Rheinfels (1623–1693). Thus began the Leibniz-Arnauld correspondence. Leibniz had hoped to produce an edition of the *Discourse* and his correspondence with Arnauld, but it was never published.

In 1685 Leibniz was removed from his engineering post and given the position of official historian of the House of Brunswick-Lüneburg. This took him, over the next three years, on extended travels through southern Germany, Austria, and Italy, officially carrying out genealogical research. While visiting Rome, he was offered the position of chief librarian at the Vatican, but turned this down as he was not prepared to convert to Catholicism. When he returned to Hanover in 1690, age 44, he had amassed a lot of archival material. The Court, no doubt, would

have been satisfied with a much less thorough account of its history than that which Leibniz proposed to do. As a result, the work dragged on, eventually to become a tiresome burden to him and a cause for complaint from the Court—indeed, Leibniz died before the history was ever completed. What did come out of it was a “preface” to the history, called *Protogaea*. This was a work on geology. It was not published during Leibniz’s lifetime but had an important influence on the field when it did appear in 1749. Other writings were produced out of the material he had gathered, including the *Code of the Law of the Peoples* (*Codex juris gentium diplomaticus*) (1693), the *Scriptores rerum Brunsvicensium* (1707), and the *Scriptorum Brunsvicensia illustrantium* (1710–1711), all of which were still prefatory to the actual history of the House of Brunswick. The *Codex* was a tract on political history. In it Leibniz deals with the methodology of that subject and speculates on the currents of history, including the causes of events in terms of infinitely small indiscernible forces. The *Scriptores* is mostly concerned with the origins of peoples: their languages and customs, and in particular the transmission of ideas through history.

From 1689 to 1691 Leibniz worked on *Dynamics*, his major work on physics, in which he sets out his basic laws of motion and force. He did not have it published, but in 1695 he produced a summary of it, part of which he published as *A Specimen of Dynamics* in the Leipzig journal *Acta Eruditorum*. Also in 1695, a version of the *Discourse* appeared in the Paris-based *Journal des Sçavans* under the title *New System*. This generated discussion and correspondence with the editor of the *Journal*, Pierre Bayle (1647–1706), and with Simon Foucher, Henri Basnage de Beauval, and others. Some important themes of the *New System* were developed in the essay *On the Radical Origination of Things*, but this was not published during Leibniz’s lifetime.

In 1697 the priority argument over the calculus began with Fatio de Duillier’s attack on Leibniz, in which he claimed that Isaac Newton had first made the discovery. In 1698 Leibniz’s essay *On Nature Itself* appeared in the *Acta Eruditorum*. In this work he produced his clearest statement yet on what he thought was wrong in the doctrines of Descartes, Spinoza, and occasionalism.

In 1700 Leibniz established the Berlin Society of Sciences and became its founding president. This organization is still in existence today, now known as the Berlin-Brandenburgische Akademie der Wissenschaften.

Also in 1700, he was elected a foreign member of the Royal Academy of Sciences in Paris. The next year, Leibniz was involved in negotiations concerning the succession of the English throne. Following the Act of Settlement, which prevented Catholics from inheriting the throne, the line of succession fell to Leibniz's employer, a grandson of James I. It is not clear how important a part Leibniz played in all this, but in 1706 he secretly composed a letter for Sir Rowland Gwyne, in which he argued the case for Georg Ludwig's succession, and subsequently arranged for it to be printed and circulated in England. The letter eventually came to the attention of Parliament, who roundly condemned it, though the author's identity was not discovered.

Leibniz had studied John Locke's great book of 1690, *An Essay Concerning Human Knowledge*, and wrote a detailed response to it: his own *New Essays*. This was completed in 1704, the same year in which Locke died. As a consequence Leibniz decided not to publish, and it did not reach the public domain until R. E. Raspe's edition appeared in 1765. This was one of only two full-length books that Leibniz ever wrote, the other being the *Theodicy*, which he published in 1710.

The priority argument over the calculus dragged on. In 1711 Leibniz made a complaint to the Royal Society in response to another claim that he had effectively plagiarized the calculus from Newton, a claim now made by a John Keill. The following year the Royal Society pronounced in its *Commercium epistolicum de analysi promota* that Newton had indeed first invented the calculus in 1669 and that Leibniz could have known about it via a letter he received from Newton as early as 1672—15 years before he published his own essay on the subject in the *Acta Eruditorum*. That Leibniz did not plagiarize the calculus, but developed it independently of Newton, has since been shown.

By 1712, at the age of 66, Leibniz had taken on additional court posts in Berlin, Vienna, and St. Petersburg. In Vienna he was made an imperial councilor. With Tsar Peter the Great he had a number of audiences between 1711 and 1716. One of the tasks assigned him by the tsar was a reform of the law and of the administration of justice in Russia.

Toward the end of his life, Leibniz sought to widen his audience beyond that of his immediate scholarly correspondents. To this end he wrote the *Principles of Nature and Grace, Founded on Reason* and the *Monadology* and sought the aid of Prince Eugene of Savoy and Nicolas Remond, in Vienna and Paris, to help spread his philosophy.

When Georg Ludwig ascended the English throne in 1714 as George I, most of the Court went with him. Leibniz considered following them to London, but he also thought of moving to Vienna, Berlin, or St. Petersburg. He was invited to move to Paris by Louis XIV himself, which he might well have done but for the king's death in 1715. Instead, Leibniz remained at Hanover, still officially the court historian.

In the last year of his life Leibniz wrote the *Discourse on the Natural Theology of the Chinese*. He had been interested in China for a long time. In this work he attempted to show that the ancient Chinese religion was based on a natural theology and could therefore be shown to be compatible with Christianity. Thus his desire to reconcile apparently opposed doctrines was present to the end.

## INTELLECTUAL BACKGROUND

Three streams of philosophical thought predominate in Leibniz's intellectual background: Renaissance humanism, scholasticism, and modern philosophy. Leibniz received tuition in all these while at university, though in Germany, as in the rest of Europe, scholasticism was still the established philosophy and the work of the Moderns was considered controversial. The mature philosophy of Leibniz cannot be clearly placed in any one of these schools of thought: he is best regarded as a Modern but with important Renaissance and scholastic tendencies. As will be seen, Leibniz was driven to synthesize these different doctrines (an approach that itself is distinctive of Renaissance thought). He came to be seen in his native Germany as a rather lone Modern in an essentially scholastic milieu.

### Renaissance Humanism

Renaissance humanism had emerged out of the enthusiasm that greeted the reentry into Europe of philosophical writings from the ancient world, including those of Pythagoras, Plato, Plotinus, and Hermes Trismegistus. Many of these were translated into Latin by the Florentine scholar Marsilio Ficino (1433–1499). This enthusiasm led, in its turn, to a revived interest in other unlost but forgotten ancient writings. Four strands of Renaissance philosophy are of interest where Leibniz is

concerned: Christian Kabbalism, Renaissance Aristotelianism, Stoicism, and Skepticism.

One particular development that came out of Ficino's translations was the occult tradition of Neoplatonism. Leibniz, on the whole, considered this tradition to be needlessly obscurantist and corrupting of what Plato had actually meant to say. However, certain doctrines that were given special prominence by the Neoplatonists were subscribed to by Leibniz, such as creative emanation and the reflection of the macrocosm in every (microcosmic) thing. Kabbalah was a synthesis of Jewish mystical teaching and Neoplatonism. Christian Kabbalah was an attempted further synthesizing of this with Christian doctrine, based on the belief that the kabbalistic texts contained fragments of a *prisca theologia*—that not everything that had been revealed to Moses had been set down in Scripture but was to be found in other ancient texts. By seemingly proving the Incarnation through the texts of Jewish Kabbalah, Christian kabbalists believed the two religions could be harmonized. Leibniz personally knew two of the most important promoters of Christian Kabbalah in the 17th century—Christian Knorr von Rosenroth (1636–1689) and Francis Mercury van Helmont (1614–1698). Though Leibniz did not believe in the *prisca theologia* premise, he did share their goal of religious harmony, and many of the Neoplatonic cosmological concepts in their writings are to be found in Leibniz's own philosophy. What is particularly noteworthy is Leibniz's secret collaboration with van Helmont on the latter's *Thoughts on Genesis*, a metaphysical commentary on the first four chapters of Genesis.

Renaissance Aristotelianism arose as a reaction against the perceived distorting of Aristotle by the scholastic tradition. One of Leibniz's teachers at Leipzig, Jakob Thomasius, encouraged Leibniz to read Aristotle in the original, constantly maintaining that the schoolmen had distorted him. Ermolao Barbaro (1454–1493) had set about restoring the original philosophy of Aristotle. Leibniz was certainly interested in Barbaro's work, but what really interested him was the reconciling of the Stagirite's teaching with Modern philosophy. In this he was influenced particularly by Erhard Weigel, whose lectures he attended at the University of Jena.

Interest in Stoicism was revived in the 16th century and by the following century was pervasive and highly influential. The presence of Stoicism is discernible in Leibniz's philosophy, for example, in the conception that all things are connected.

The Renaissance also saw a revival of the arguments of the ancient skeptics. Although concerned to address the problems they posed, Leibniz was repelled by the conclusions of Pyrrhonism that, in the face of unmitigated skepticism, one can do no better than aim for “suspension of judgment.” Foucher and Bayle were two skeptics with whom Leibniz corresponded and with whom he had excellent relations.

## Scholasticism

Another important current in the thought of Leibniz comes from his interest in the problems that were given prominence by the scholastics. The established philosophy of the Middle Ages, scholasticism came under heavy pressure from the criticism of Renaissance humanists. Yet it was its response to this criticism that provided scholasticism with a new lease on life in the late 16th century, such that it was to remain the predominant philosophy throughout Europe until the end of the 17th century. Answering the humanists, the scholastics adopted new styles and absorbed and dealt with new problems and ideas. A key figure in this process was the Spanish Jesuit Francisco Suárez, whose writings undoubtedly influenced Leibniz.

Leibniz had been schooled in scholasticism, and although he agreed with the criticisms leveled at it by the Renaissance humanists and the Moderns, he remained concerned with what he considered the more profound problems of the schoolmen—for example, the problem of the composition of the continuum (concerning which, Leibniz read the scholastic Libert Fromond [1587–1653]); the problem of free will versus divine predestination; and the problem of contingency. And it was the principle of individuation, which the scholastics had discussed at length, that was the subject of Leibniz’s bachelor’s thesis.

## Modern Philosophy

Modern philosophy had been born out of a rebellion of reason against the established scholastic philosophy, on account of the latter’s dogmatism and alleged obscurantism—for example, the invocation of occult entities such as the substantial forms. But if scholasticism were to be rejected, what should take its place? The Modern spirit was not against the establishment of one true philosophy—indeed it was, in part, a

manifestation of the need of the time to reverse the fragmented medley of philosophical doctrines, variously dogmatic, eclectic, and skeptic. Modern philosophy sought to establish one true philosophy, and this on nondogmatic, nonauthoritarian grounds. In this way, nature came to be explained through the application of mathematical methods to the primary qualities of things—their magnitude, figure, and motion. Out of this mechanical philosophy emerged natural science: the activity of acquiring knowledge through experiment and demonstration. This was pioneered by Francis Bacon (1561–1626), whose *Advancement of Learning* (1605) and *Novum organon* (1620) impressed the young Leibniz. Indeed Leibniz says that he was led into Modern philosophy by Bacon and Gassendi. Gassendi had revived the atomism of Democritus and Epicurus and sought to reconcile it with Christianity.

Other important founding figures of Modern philosophy were Kepler, Galileo, and Descartes. Kepler had worked on motion, in particular the application of mathematics to the motion of celestial objects. His idea of a natural motion possessed by bodies, and his work on mathematics, were developed by Leibniz. Galileo, who had developed Copernican astronomy, had also advanced the science of motion. His *Two New Sciences* (1638) was read by Leibniz, and it inspired him to work on motion. Descartes, despite the huge contribution he had made to mathematics and the natural sciences, was not studied by Leibniz until he went to Paris in the early 1670s. Descartes's conception of matter, as that which is essentially extended, seemed to undermine a number of aspects of Christian doctrine, which led to the suppression of his works in France and Germany. Although Leibniz made more references to Descartes than to any other philosopher, these references are predominantly critical, and he was not much influenced by him.

Of Leibniz's contemporaries, Thomas Hobbes, Spinoza, Nicolas Malebranche, Arnauld, Newton, Locke, and Bayle are most worthy of attention. Leibniz knew of Hobbes mainly through his *Elements of Philosophy*. In this work Hobbes seeks to connect together in a common mechanical worldview the physical world, human beings, and the citizens of the state. Leibniz's work on motion was influenced by Hobbes's *De corpore*, which he read in 1670. He was particularly impressed by Hobbes's idea that all thought is computation, though he resisted his nominalism and deterministic materialism.

Having read Spinoza's *Theologico-Political Treatise* (1670) and conversed with some of his disciples in Paris, Leibniz had high hopes of the Dutchman. He met him at The Hague in 1676 for several days' conversation. But Leibniz was seemingly disappointed with the *Ethics*, believing that the metaphysics set out there fell short of being clearly and fully demonstrated. Even so, Leibniz's own metaphysics has been occasionally interpreted over the years as being Spinozistic.

Malebranche's *Search after Truth* (1673–1675) had helped to improve Descartes's reputation among his religious critics, and his doctrine of "occasionalism" had seemed to solve the mind–body communication problem by advocating that only God was a real cause, there being no real influences among created things. This led to the theory that our perceptions do not arise from sensations. This concept was to be of seminal influence on Leibniz, though he disagreed with Malebranche's claim that our perceptions are not in us but in God. In his *Treatise of Nature and of Grace* (1680), Malebranche had proposed that God's grace is not arbitrary. Leibniz agreed that God's actions are good because he acts according to an antecedent goodness, a view that is opposed to that of "voluntarism," in which God's actions are good simply by virtue of being *his* actions.

Voluntarism was the position held by Arnauld, a Jansenist theologian and philosopher. Sharing the high repute generally accorded to him, Leibniz sent Arnauld a copy of his *Discourse on Metaphysics* for his opinion. The correspondence that ensued between the two, in which Arnauld made penetrating comments, led Leibniz to clarify certain points and to redefine his position.

After studying Newton's *Principles*, Leibniz criticized its author for giving priority to the mathematical expressibility of nature over a coherent account of the phenomena themselves. Thus he took issue with many of the concepts employed by Newton in his dynamics, such as the transfer of force, both by mechanical interaction and by gravitational action at a distance. Indeed Leibniz joined the Cartesians in rejecting gravity on the grounds that it was no more than an occult force. In articulating his objections to Newton's absolute conceptions of space, time, and motion, Leibniz was stimulated to develop his own relationalist doctrine. These contrasting views culminated in his correspondence with Newton's ally, Samuel Clarke.

In 1700 Leibniz studied Locke's great work, *An Essay Concerning Human Understanding*, but he seems to have been almost entirely un-influenced by it. His own *New Essays* was written as a straightforward attempted refutation of it.

Bayle was the author of *Dictionnaire historique et critique* (1696), which represented a vast array of thinkers and doctrines. It was in this work that Leibniz's system was given its first serious attention. A correspondence began between Bayle and Leibniz, in which the former had some influence on the latter by means of his skeptical arguments. Bayle's own Manichean sympathies provoked Leibniz into writing and publishing the *Theodicy*.

### PRIMARY AIMS AND INTERESTS

Although considering himself primarily a Modern—he made significant contributions to mathematics and physics—Leibniz thought that much of Modern philosophy was powered by the spirit of sectarianism. This was a defect insofar as it represented a self-imposition of limits on what could otherwise be absorbed from outside its own particular school of thought. An important case in point was the wholesale rejection of Aristotelian philosophy. Nothing could be gained and much was to be lost by such a sectarian approach. It was the opposite of eclecticism, which seemed to Leibniz to be the obvious and most expeditious way to advance the cause of philosophy and truth. This reviving and combining of different philosophical traditions is Renaissance in spirit, and Leibniz was first inspired toward taking such an eclectic approach by Johann Scherzer at Leipzig University and Erhard Weigel at Jena University.

The eclectic approach is based on the premise that progress toward a single doctrine of truth can be made by the extracting of the fundamental true ideas that underlie all the disparate doctrines there are. Such a unified body of truth, if presented in the right way, could acquire the assent of all people. In seeking the assent of others for his own doctrine, Leibniz presented it in a “conciliatory” fashion: one that avoided terms that would repel his audience and lose their sympathy, but would instead attract their interest and guide them by reason, such that, unless they were mentally deficient, they would be unable to resist the truth of

his conclusions. Leibniz's conciliatory approach thus involved the adjustment of his presentation to suit his audience. This style is responsible for many of the instances in which Leibniz appears to vacillate or be disingenuous about some issue.

In devising a metaphysical system as a single body of truth, Leibniz hoped to repair the intellectual fragmentation of the 17th century. He hoped to reconcile the disparate schools of Aristotelianism/scholasticism with Modern philosophy, of atomism with Cartesianism, and mechanism with vitalism. And he further hoped to repair the spiritual and religious fragmentation of Europe by reconciling the Protestant and Catholic churches—a first step toward which he made with his *Catholic Demonstrations* (1668–1671), for example, by trying to solve the philosophical difficulties in the concept of transubstantiation. Leibniz believed that out of intellectual and religious harmony, a political and social peace would follow. The thought that he could play a significant role in this process—and he strove for this all his life—seems to be his philosophical *raison d'être*, one man's response to the internecine human situation into which he had been born.

One of Leibniz's principal interests was the concept of substance—that of which reality actually consists—and this was of concern to him at least as early as 1663, the year in which he wrote his undergraduate thesis, *Metaphysical Disputation on the Principle of Individuation*. The conception he developed of the substantial nature of reality converged, in time, with his metaphysical considerations in the areas of his other main interests: (1) language, logic, and truth; (2) physics and mathematics; and (3) mind. Thus, in (1), substance is defined in terms of subject-predicate logic; in (2), a conception of substance is used that overcomes the difficulties in the physics of Modern philosophy by incorporating Aristotelian notions of substance (and thus effecting a reconciliation of Aristotelian and Modern philosophy); and in (3), a conception of mental substance is used to reconcile mechanism and vitalism.

The convergence of Leibniz's metaphysical considerations in these areas around a common conception of substance resulted in a single synthesized metaphysical system, through which each individual area then becomes explicable. One implication of this synthesis is that each area individually becomes difficult to understand without a sufficient grasp of each of the others. And the scholar's work is made more difficult by the fact that Leibniz's views were not set down systematically

and comprehensively in books but, for the most part, have to be extracted from letters, short essays, and other fragments.

Leibniz first set down a system of metaphysics in 1686—in the *Discourse on Metaphysics*. This was not published until it had been modified in light of his correspondence with Arnauld. It then appeared in 1695 as the *New System*. In the years that followed, Leibniz continued to refine this system, producing writings that sometimes focused on elucidating particular areas of it, and at other times modifying the presentation of it to suit the intellectual tastes of a particular audience. The process culminated in the succinct condensed account given in the *Monadology* of 1714. Scholars continue to investigate whether, or to what extent, substantial changes occurred to his system after the *Discourse on Metaphysics*. They also seek evidence in Leibniz's earlier writings to try to establish when he first asserted the key principles of his system. In what follows, a brief overview will be given of his work in the three areas above, to which will be added a short account of Leibniz's practical philosophy.

### **Language, Logic, and Truth**

Leibniz's work on language and logic had its origins in his youthful project of universal science, the first steps toward which he took in his *Dissertation on the Art of Combination* (1666). Aspects of this continued to receive his attention for most of his life. His theory of truth and his conception of substance also grew out of this early work. His interest in a universal science was inspired during his years at university when he had read the Herborn encyclopedists, Alsted and Bisterfeld, and the *Ars magna* of Ramon Lull. He conceived of his universal science as a method for realizing the claim of Hobbes, which he shared, that all true reasoning was right calculation. Two things had to be achieved to make this possible. First, by a process of analysis, language itself had to be reduced to elemental concepts, and each of these needed to have a symbol assigned to it. This stage would result in a vocabulary of symbols in which an entire language could be represented through its basic concepts. As late as 1704, Leibniz was still engaged in compiling such a vocabulary. Second, given the belief that reasoning, or the right forming of propositions, was mere computation, the rules which effected the synthetic process of correctly combining the elemental con-

cepts had to be ascertained. This stage would result in a calculus or a set of formal rules. By means of this method of universal science, Leibniz believed that complex propositions could be infallibly deduced by computation. His idea for, and subsequent design of, a calculating machine was a direct result of this belief.

The first stage of language analysis was based on Leibniz's belief that all the concepts of language are either simple or complex, and that the complex could be reduced to the simple. Leibniz agreed with Augustine that in order to know the truth of a proposition one had to be able to show that it could be deduced in the same way that mathematical truths are deduced. That is, by substituting identical terms, a complex proposition can be reduced into a statement of identity, which, by the principle of contradiction, is taken to be self-evidently true. Leibniz always believed that all propositions have a subject-predicate form, or that those which are not already in that "X is Y" form can be made into such. He argued that all parts of speech were either adjectives or, if not, could be ignored, eliminated, or changed into adjectives. All propositions could in principle be represented in the subject-predicate form, either as elemental self-evidently true ones, such as "a male is a male," or as a complex one capable of reduction into an elemental one, such as "a bachelor is an unmarried man." That all language propositions could be so represented permitted their computation in the second stage.

The formal rules for correctly combining basic concepts to form true propositions also had to be modeled on the analogy with mathematics. Leibniz worked on developing numerical methods to represent logical inferences. In *Elements of a Calculus* (1679), he shows how the production of complex propositions from simple ones is analogous to the multiplication of numbers. In *A Study of the Calculus of Real Addition* (1690), the multiplication analogy is replaced by a more general function for combining concepts, which Leibniz represents by the notation " $\oplus$ ." For example, the concepts "rational," "animal," and "human being" may be represented by "A," "B," and "L," respectively, and combined to form the proposition " $A \oplus B = L$ ." Leibniz sets down 24 propositions deduced from a variety of axioms and definitions. These are similar to the formal deductive system of George Boole's, who almost 200 years later had to reinvent much of Leibniz's unpublished work. Leibniz is, therefore, considered by many to be the father of symbolic logic.

An expression such as “ $A \oplus B = L$ ” can be interpreted both extensionally and intensionally. As extensive, the expression implies that all the terms included in the class “ $A \oplus B$ ” extend to, or include, all the terms in the class “ $L$ .” As intensive, or conceptual, the expression implies that the concept of “ $L$ ” includes the concept of “ $A \oplus B$ .” Leibniz claimed that the assertion of the truth of a proposition is one of conceptual inclusion, and thus he adopts the intensional interpretation of logical propositions. Truth, insofar as it relates to propositions, concerns not their substantive terms, including whether they exist or not, but purely the meaning inclusion between concepts.

Leibniz thus defines a true proposition as one in which the concept of the predicate is included in the concept of the subject. This is applicable, therefore, only to propositions of the subject-predicate form, though Leibniz believes that all language statements can be reduced to this form. This treatment of language presupposes that “behind” the grammatical subject and its predicate are the corresponding metaphysical entities of substance and property. Leibniz’s belief that all language propositions are reducible to the subject-predicate form implies that, in reality, there are only substances and their properties—all other things being mere derivatives. Thus space and time, for example, need to be understood as relations between substances and not as real in themselves.

That all true propositions are those whose predicate concepts are included in their subject concepts implies that all true propositions are analytic: that full knowledge of the complete concept of the subject already includes all the predicates that it can ever have. In insisting that all true propositions are, at the same time, analytic, Leibniz identifies three types of analytic statement:

1. The *identity proposition*, which is self-evidently true by virtue of the principle of contradiction. For example, “a male is a male.”
2. The *explicitly analytic proposition*, in which the predicate can be shown to be included in the subject, that is, the proposition can be reduced by due substitution of terms to an identity proposition. For example, “a bachelor is an unmarried man.”
3. The *implicitly analytic proposition*, in which the predicate concept is still asserted to be included in the subject concept even though such cannot be demonstrated. For example, “Caesar crossed the Rubicon.” In holding this belief, Leibniz extends the medieval

*predicatum inest subiecto* principle to propositions of fact about the world, of which the complete concept of the subject could only be known by an infinite mind. Hence this definition of truth depends on the existence of God.

The claim that propositions of fact, each and all, are analytic is enshrined in Leibniz's principle of sufficient reason. Every thing, every state, has a reason for why it is as it is and not otherwise, because the predicates that define it—as it truly is—are included in the concept of its subject—though such knowledge is, of course, available only to the infinite mind. If language contains true propositions, then it does so by virtue of its representing that of which reality consists, substance. From his earliest undergraduate thesis, Leibniz considered that the individuation of reality into individual substances was possible only if all the properties that such a substance can ever have are *essential* properties of it. For any one conceivable substance, there is an endless number of other almost identical conceivable substances, all of which are differentiated from each other only by the most minute detail. Yet substances can only be distinguished fully from each other as real individuals if the entirety of their details—their properties—are made essential to them. Thus, in the same way that all the properties of a substance are essential for that substance's very existence—as an individual substance—so in true propositions about the real world all the predicates of the subject are included in the complete concept of that subject. That two or more things cannot be truly individuated unless they possess at least one qualitative dissimilarity is Leibniz's principle of the identity of indiscernibles.

The truth of a proposition, for Leibniz, concerns the inclusion of a predicate in a subject. But this says nothing as to whether or not that subject itself actually exists, that is, has a counterpart in a real substance. Leibniz takes the concept "world" to mean that which is the complete set of all propositions of fact. If such a set differed by so much as a single fact, then it would no longer be the same set and would be another world. Logically, there could be an endless number of different sets of facts and arrangements of these facts—that is, an endless number of different possible worlds. Since, by the principle of contradiction, there can only be one *actual* world, the existence of this world, and of its substances and their arrangements and the existential propositions

that correspond to these substances—all must be contingent, that is, must depend upon some other (extramundane) thing. Hence, the existence of substances and the truth of existential propositions are contingent. On the other hand, those propositions of the subject-predicate kind, be they singular or universal propositions, while being necessary truths, say nothing as to the existential import of their subjects.

The principle of sufficient reason is the demand that an a priori proof exist for every proposition. In the case of necessary propositions, their truths find an a priori proof through analysis of their predicate and subject concepts. Propositions of this type are true in all possible worlds. In the case of contingent (existential) propositions, their truths must also be demonstrable a priori. But here an infinite analysis is involved because the truth of an existential fact depends on showing how that fact is requisite to the best possible world, which in turn involves a comprehension of all the infinite other possible facts in their infinite possible arrangements. Leibniz believed that we can prove a priori both the existence of God and that the world he created is the best of the possible ones—which is indeed necessary if the principle of sufficient reason is to be maintained at this cosmological level. But such an infinite process of analysis implies that our finite minds could never attain to certainty with regard to contingent (existential) propositions: human beings must make do with the a posteriori knowledge gained through sense-experience.

## Physics and Mathematics

At the beginning of the 17th century, the medieval conception of nature was still predominant. Bodies were believed to be constituted of the four elements, the innate tendencies of which were responsible for all the properties that bodies could have. During the century this view was replaced by the mechanistic one in which the constitution of bodies, and their characteristics, were to be explained in terms of but one underlying element—matter. Changes in bodies were now to be understood through the observed regularities of mechanical interaction, which were to be expressed, mathematically, as laws. In the 1630s Descartes established many of the key principles of the new science of mechanics. He sought to show how all the properties of bodies, and their changes, could be expressed in terms of shape, size, position, and motion. These

four basic properties are themselves modes of spatial extension, which Descartes accordingly inferred to be the essence of matter.

Leibniz objected to the Cartesian claim that the essence of material body was extension alone, for three chief reasons:

1. It seemed obvious to Leibniz that extension itself was not an actual thing, but just a mode of some other thing. What was the nature of the real thing that was being extended? Or, perhaps, repeatedly presenting itself over an (extended) three-dimensional piece of the universe? Leibniz answers that the fundamental reality here is “resisting force.” This is the ultimate constituent of matter, and its continuous repetition in the form of points of resisting force is commensurate with its manifestation as bodily spatial extension.
2. Leibniz argued that if extension alone were the essence of matter, rather than something real, such as resisting force, then the universe could not be distinguishable into real parts. Consequently, there could be no real material objects and no real parts of objects, and so it would make no sense to speak of the motion of objects or of the change of characteristics of objects.
3. Leibniz claimed that the conservation of motion observed in the interaction between bodies of different sizes could not be explained through the four Cartesian spatial properties alone. A correct explanation required the additional properties of mass, which was absent in Descartes’s dynamics.

Furthermore, Leibniz claimed that Descartes had not included the *direction* of motion of the trajectories of bodies in collisions. That is, he had not distinguished between mere scalar, nondirectional motion and velocity. Leibniz calculated that the true “quantity” of motion, or *momentum*, that bodies have is a product of their mass and their velocity. Momentum is conserved in collisions between theoretically hard bodies; but only when they occur in the same plane. Otherwise, for example, in the case of falling bodies, it is something else that is conserved—what Leibniz termed “*vis viva*” or “living force.” Either way, the dynamics of interacting bodies could not be accounted for by spatial properties alone.

Descartes's physics was gradually replaced by the more comprehensive Newtonian physics, starting from the publication of the *Principles* in 1687. A defining principle of the mechanical philosophy was that all changes in bodies were to be explained in terms of their physical interaction. But, so it seemed to Leibniz, two theories employed by Newton in his physics broke with this fundamental principle. Both the theory of gravity and that of atomism employed ideas of motion transfer that, on closer inspection, could not be conceived to occur through mechanistic interaction of material bodies. Insofar as Newton, through these theories, asserted efficient causes, Leibniz called them miracles. Gravity, or action at a distance, almost by definition precluded mechanical interaction. That gravity was a force that invisibly pulled bodies together was disputed by Leibniz on the grounds that, like the rest of Newton's forces, it was not a real thing. Gravity was a mere derivation, a mere mode, of mass and velocity. It could hardly, therefore, be used to explain the movements of bodies if its very conception depended on them.

Leibniz rejected the atomism in Newton's physics chiefly because of two insurmountable problems:

1. A proper conception of the atom had to be that which denied extension to it—otherwise it would have parts and not be an atom. But that which lacks parts must be infinitely hard, since there is no possibility of compression. In collisions between such infinitely hard bodies, transfer of motion would have to happen instantaneously, a process prohibited by Leibniz's principle of continuity.
2. If atoms were the ultimate constituents of bodies, what is it that coheres them into discrete bodies? If it is "coherence at a distance," a force like gravity, then it is already discredited. If only atoms exist, as is asserted, then there are no other entities to act on the atoms. If the cohesion of atoms is effected mechanically by the process of certain interlocking features, such as hooks and eyes, then this begs the question as to what coheres the atoms into having such features in the first place. Moreover, that which is without extension cannot have features of shape.

But Leibniz had already generally rejected the concept of the atom, arguing that matter had to be infinitely divisible. In considering what the essence of matter might be, he rejected both the atomism of Newton

and the extension of Descartes. In their place he proposed a new conception in which matter was reduced to force. This force came in two types: active and passive, which he related to the Aristotelian notions of form and matter. All created things were really comprised of active and passive force. Passive force was resistance—impenetrability, inertia—and was manifested as a thing's material body. Active force was that which overcame resistance, or that which moved another. All the forces dealt with in physics are mere derivatives or manifestations of these two fundamental forces.

In proposing that nature is infinitely divisible, Leibniz was asserting that the universe, and hence every piece of matter, is composed of an infinite repetition (continuum) of forces. Since there is an infinity of these forces in every part of nature, each force must be infinitesimal or dimensionless. This is the concept of the monad. Matter, thus, is not a real thing made out of monads (since the dimensionless cannot accumulate into the extended) but must be a derivative thing or a phenomenon. Only that which is not an aggregate—does not depend on constituents—can be a substance.

If influence by physical impact between created things is impossible for atoms, it is still impossible in Leibniz's new conception of matter, which is not constituted of atoms but is infinitely divisible. In this conception, transfer of motion would not involve two simple (atomic) bodies colliding but two bodies each composed of an infinity of parts, for which the transfer of motion by impact between these parts would involve an infinity of collisions, with no ultimate real collision and motion transfer ever being reached. If nature is infinitely divisible and is comprised of infinitesimal monads, then the properties of things and their changes could not be the result of external influences by physical interaction but could only be the result of an internal or spontaneous influence—from within the monad itself.

In this new conception, a material body is an extended continuous repetition of monadic forces. Hence, extension and space are mere derivatives because their notions depend on the existence of forces. Leibniz defines *space* as the system of relations that obtains among objects, and relations are the properties of substances. Therefore, Leibniz opposes Newton's conception of space as absolute, as a container that exists prior to, and is independent of, bodies. In Leibniz's relational theory of space, it is meaningless to talk of whether or not the universe

could have been created in a different place or could move position, since position itself is given only in terms of other (already existing) objects, none of which could be outside the universe or could preexist the universe. That is, there can be no space without objects.

Similar arguments pertain with regard to time. Leibniz defines *time* as the system of relations among successive events, which depends, of course, on the existence of objects. Therefore Leibniz opposes Newton's conception of time as absolute, arguing that it is meaningless to talk about whether or not the universe could have been created earlier or later. Since temporal relations depend on (already existing) objects, there can be no time without objects.

Having rejected the notions of absolute space and time, the rejection of absolute motion follows, for if there is no unmoving absolute space as fixed background, there can be no way of determining distance absolutely. Nor is there a fixed absolute time from which the rate of distance traversed can be determined absolutely. Furthermore, if motion is merely relational, then it cannot be known whether any particular body really moves at all. However, we do observe changes in the distances that separate objects. Therefore, if such motion is real, then it must be the property of at least one of the bodies concerned. That is, there must be an active force inherent in at least one of those bodies that causes the observed motion.

Many of Leibniz's considerations on the continuum, and on the nature of space and time, were influenced by his work in mathematics, particularly his work on the infinitesimal calculus. During his time in Paris, Leibniz had been concerned with the old problem of how to square the circle—how to produce a square with the same area as some given circle. To do this required using an accurate value for  $\pi$ . Leibniz discovered that an actual value for  $\pi$ , specifically  $\pi/4$ , could be reached by summing all the terms of a series:

$$1/1 - 1/3 + 1/5 - 1/7 + \dots$$

But the series was infinite. In searching for a way to sum an infinite series, Leibniz discovered the infinitesimal calculus: differentiation as a method for calculating the limit of a series, and integration for calculating the sum of a series.

## Mind and the System of Monads

Leibniz accepts that the universe may be described in the way that physics describes it, that is, in terms of matter and mechanical interaction. But he regards the material and mechanical as merely phenomenal. The true metaphysical nature of the universe and its changes should, he claims, be understood in terms of monadic substances. Since matter is infinitely divisible, the transfer of motion by mechanical collision is impossible. Therefore change, motion, must be a property of substance, which is effected not by an extrinsic influence but by an intrinsic one: an internal active force. This idea coincides with the conception of substance that emerged from Leibniz's considerations on language, logic, and truth: that a substance is only individuated (from all other similar possible ones) by virtue of all the properties that will ever belong to it. That is, the complete concept of the subject in a true proposition contains all the predicates that will ever belong to it.

The monadic substance is unextended, that is, immaterial, incorporeal. According to Leibniz, it is most immediately known to us as our own soul. Indeed, all monads are soul-like, though, according to the principle of continuity, they differ only by degree and without any radical difference of type. In that all of nature consists of monads, which are active forces to some degree, there is nothing, including matter, that is absolutely dead or inert. Every monad, and everything derived of monads, has some tendency toward motion and change. In higher grades of souls, this tendency is "desire." In this way, all of nature can be considered to be vital, and the differences between the nonliving and the living, and between animals and human beings, are only differences of degree.

Descartes and Locke had argued that only human beings have consciousness and reason. Leibniz agrees, but denies that the only mental states or motive forces in us are those that we are aware of. That is, because of his commitment to degrees of vitality, he asserts the presence in us of unconscious perceptions and appetitions.

Descartes had radically separated (human) mind from body, the latter being conceived as a machine whose changes were to be explained mechanically. How the dual substances of mind and body were then supposed to communicate is a notorious problem, at once conflicting with a key principle of mechanical philosophy. Leibniz, however, is not

confronted by this problem as to *how* such a communication can occur, since he denies that communication *ever* occurs at all between substances. He claims that all change in nature is the result of an internal active force in monads, whose properties unfold in the same way that predicates unfold from their complete concepts. That change seems to occur in the realm of physics as a result of extrinsic influences is, he says, illusory. Such a cause is abstracted out of a particular pattern of changes that are, themselves, really the spontaneous unfoldings of each monad, separately and independently. That the properties of monads unfold from within, separately and independently yet in a way that produces the appearance of mechanical interaction, is due to the fact that the complete concepts of monads have all been conceived in God's mind in relation to each other. Indeed, in conceiving a substance completely, the infinite mind must comprehend every predicate it can have, which involves knowing its relations to all other substances in its universe. In this way the complete concept of every substance already expresses all the rest (of the substances) of the universe and so, in this way, is said by Leibniz to mirror the universe from its own particular point of view. Leibniz terms this interrelation of all substances, along with their unfolding changing states, a "preestablished harmony." Hence, Leibniz succeeds in reconciling mechanism with vitalism.

The mental states, or perceptions, of monads differ in their degrees of clarity or vivacity according to the extent and detail to which they express the rest of the universe. The clearest perceptions are usually those that represent what is most proximate to the monad, spatially and temporally. Leibniz distinguishes three bands of monad, according to the clarity or confusion of their perceptions. "Conscious" perception is that possessed by the souls of animals, a level of clarity effected by the faculty of memory. "Self-conscious" perception, or apperception, is possessed by human beings and depends on the faculty of reason as well as memory. "Unconscious" perception is the category of lowest clarity and is possessed by mere "entelechies" or "bare" monads, those that lack memory.

The world, then, consists of nothing but monadic substances, whose preestablished harmony determines both their individual perceptions and their interrelations, the latter giving rise to derivative phenomena such as material bodies. Yet, because this world is only one among an infinity of possible worlds that could logically exist, each of the sub-

stances of this actual world has only a contingent existence. There must be a sufficient reason for the existence of this world of substances, and it clearly must lie in a reality that is not of this world and is not contingent on any other substance itself, that is, is a necessary and therefore an original substance. According to Leibniz, this extramundane reality is the substance of God. The ontological relationship between the original necessary substance of God and the contingent monadic substances of the world is that of creator and created. However, this relationship of existential dependence is an enduring one: creation is not a finite event but a continuous relationship.

Leibniz claims that it is God's attribute of perfect goodness that is the sufficient reason for the (contingent) existence of created substances. His understanding of this "goodness" is that it determines God to choose both to create and to create the best world. Though God is determined by his attribute of goodness, Leibniz maintains that God's choice is a free one—by which he really means "spontaneous"—by virtue of the fact that the determining goodness lies *within* God himself. However, this world that he has created is not perfect. Yet it is the most perfect *possible*. Indeed, if it were perfect then it would be indistinguishable from God. These points, Leibniz believes, answer the notorious problem as to why an omnipotent, omniscient, omnibenevolent God could have created a world so imperfect and containing so much evil as this one does. Leibniz's conception of the best world that can possibly be achieved is the one that contains the maximum possible existence combined with the maximum possible order. This translates into the creating of an infinity of substances, all of which are harmonized with each other—not as a perfect harmony, but to the highest degree possible.

## Values and Practical Philosophy

Leibniz is remembered as a mathematician of genius, as the greatest logician since Aristotle, and as perhaps the last truly encyclopedic philosopher. But though he was certainly a man of theory, he was not averse to putting theory into practice, as is shown by his models for calculating machines and pumps for extracting water from mines. Though, in philosophy, many of his most original contributions were on the theoretical and speculative side, he thought of himself as a practical philosopher. As a lawyer, an advisor on political matters, and a courtier,

he could hardly fail to have thought about ethics, jurisprudence, political philosophy, and the arts. And indeed these areas are integral to his philosophy. They were important for him but, being less original and less well developed than his work in other areas, they have naturally received less attention.

Leibniz's practical philosophy is developed from his metaphysics. He himself wrote that ethics and metaphysics "demand one another's company" (GP iii 637; L 159). Much of his practical philosophy follows from his metaphysical speculations about God's creation of the world. His "optimism," as it came to be called—his view that this is the best possible world—follows from the fact, as he thought he could demonstrate, that it had been created by a perfect being. The world is also the most harmonious possible and therefore the most beautiful. God as a rational being therefore takes pleasure from his creation. And all rational creatures, who are made in the image of God, also take delight in harmony. In creating works of art we imitate, after our fashion, the creation of the world and the pleasure we take in them is due, according to Leibniz, to the fact that, as rational beings, we are bound to find pleasure in harmony. Music was perhaps the most important of the arts for Leibniz and the only one for which he developed any kind of theoretical point of view.

But the pleasures of listening to music are ones that pass. Happiness, for Leibniz, is lasting pleasure. And true happiness is to be derived from reflecting on the harmony of the universe. Indeed the beatific vision—granted, according to the Catholic faith, to the blessed when they are brought before God—is, as Leibniz glosses it, a vision of the beauty of God's creation. We can approach closer to such a vision, though nowhere near it, by engaging in scientific investigation and by discovering for ourselves the underlying harmony of the world in which we live. Leibniz was impressed, as others continued to be throughout the 18th century and beyond, by the argument for the existence of God from the beauty and the wonderful order of the physical universe.

Ethics, for Leibniz, is the science of wisdom, that is, of how to achieve happiness. Leibniz takes it to be part of our nature to pursue our own happiness. But what about the happiness of others? Some of the time he seems to want to say that we are social beings and that our happiness is bound up with the happiness of others. To love someone is, according to Leibniz, to take pleasure from that person's happiness. In

Leibniz's perfect society—his “City of God”—those who find their happiness in the happiness of others are rewarded. There is a harmonious moral order, underpinned by a metaphysics that leaves room for immortality, which Leibniz presents as God's universal justice. In this moral order, virtue is properly rewarded and wickedness is punished.

The City of God is an ideal society, governed by a perfect monarch who loves his subjects and governs them wisely, reasonably, and justly with a view to promoting their true happiness. Leibniz never developed a clear political theory, but he did not separate theology and politics in the way we do. He had a particular hatred of the naked use of arbitrary power, and his writing is rarely more passionate than when he is attacking those philosophers who represented God as a despot. He did not object to absolute monarchy as such—he spent much of his life trying to get the powerful and wealthy to back his current project, for instance, for some new learned society or other—but he hated dictators and his preference may have been for an elective monarchy. His approval of William of Orange seems to have been genuine, though not connected with what the British saw as his main qualifications—namely, being a Protestant and being married to someone with a claim to the throne. Writing to a British correspondent with reference to William he remarked: “The end of monarchy . . . is to make a hero of eminent wisdom and virtue reign” (GP iii 277).

Leibniz's dislike of arbitrary dictatorship and his insistence on the rule of reason extended to his philosophy of law. What God does is just, but not merely because God does it. For Leibniz what is truly just is a matter of eternal truth independent of the will of God. Equally, what is just cannot be so merely because the sovereign of a particular state has declared it to be so. Leibniz regarded justice as a matter for natural and therefore for international law. This was by his time a well-established position and Leibniz did not make as original a contribution to it as to other areas. But his acceptance of natural law is integral to his philosophy and to his view that there are sciences of eternal truth that include ethics and jurisprudence as much as logic and arithmetic.



## The Dictionary

– A –

**ABSOLUTE NECESSITY** (*NECESSITAS ABSOLUTA/NÉCESSITÉ ABSOLUE*). An outcome was said by Leibniz and some of his critics to be “absolutely necessary” if it was **logically** impossible for things to have turned out otherwise. This kind of necessity is sometimes also called “**metaphysical**,” “**geometric**,” or even “brute” necessity. It is, for Leibniz, the kind of necessity that attaches to the **truths** of logic and **mathematics** and the kind involved in **fatalism**. Leibniz’s reply to the charge of fatalism leveled against his metaphysics turns on his distinction between absolute necessity and another kind of necessity he calls a “**hypothetical necessity**.”

According to Leibniz’s generalized *inesse principle*, it was part of the **complete concept** of Judas that he would betray Christ. It seems to follow, as **Antoine Arnauld** thought it did, that it is absolutely necessary for *this* Judas (in contrast with one in another **possible world**) to betray Christ. And, if this were true, it would be **God** who was to blame for the **evil** done by Judas or, for that matter, anyone else. Leibniz held that it was part of Judas’s complete concept that he would freely betray Christ and that, absolutely speaking, it was possible for him not to have done it. He admitted that God created *this* Judas (who would betray Christ) and so that God **concurs** in the **evil** done because he knows that he can draw good from it in the context of a world that, notwithstanding the evil done, is still the best possible. In this sense, it was *hypothetically necessary*, according to Leibniz, that Judas betray Christ—since it follows on the assumption that God chose to create the best possible world, of which that act forms an integral part—but it was not *absolutely necessary* for the evil to be

done. Neither was it absolutely necessary, according to Leibniz, for God to create the best possible world.

**ABSTRACTION** (*ABSTRACTIO/ABSTRACTION*). Leibniz believed that there were abstract **ideas** that could be formed on the basis of selected common features and which enabled humans to know **eternal truths**. He did not object to abstraction as a process. At the same time, his sympathies lay with a form of **nominalism**—believing that the only things that exist are particular. As such, he did not believe in the existence of abstract entities such as “beingness,” and he joined in the widespread criticism on this account made against the generality of the **scholastics**. In his preface to a new edition of **Nizolius** he prepared in 1670, he even went so far as to say that if someone wanted to give a wholly satisfactory account of the elements of philosophy they would need to “abstain from abstract terms almost entirely” (GP iv 147; L 126). He was also critical of metaphysicians who made use of incomplete notions—who were led into supposing erroneously that, for instance, there were individual things in the universe that differed only in number, contrary to his principle of the identity of **indiscernibles**.

Leibniz did not, however, go far enough for some of his younger contemporaries, who criticized his metaphysics because of the abstraction they claimed it involved. **John Toland**, for instance, regarded Leibniz’s concept of a **monad** as based upon illegitimate use of abstract notions. **George Berkeley** wrote against the abstractions in Leibniz’s **dynamics**, such as **force**. Leibniz staunchly resisted this line of criticism, however. For him, the human capacity to have knowledge of abstract eternal truths about, for instance, **justice**, is part of what distinguishes us as rational beings from other **animals**. Though he claimed to find much in Berkeley’s *Principles* he could agree with, Leibniz identified the Irishman’s rejection of abstract ideas as the most serious fault in his philosophy. Leibniz rejected the very basis of **empiricist** theories of abstraction, which assume that all ideas come from experience and all ideas are particular. Anyone who accepts such a standpoint will regard abstract ideas as a problem. Leibniz, however, did not. On the contrary, he followed in a tradition of Christian **Platonism**—accepting **innate ideas** without, however, supposing ideas could exist outside any mind. According to this tra-

dition, there is a “realm of ideas” corresponding to Plato’s eternal realm of forms but it exists only in the mind of **God**.

**ACADEMIC SKEPTICISM.** Historically, the standpoint of the **skeptics** of **Plato**’s later academy, such as Carneades (c. 231–128 B.C.). Leibniz’s skeptical friend **Simon Foucher** presented himself as an Academic skeptic following what he claimed was **Augustine**’s support for the position. Academic skepticism, so understood, involved a strict method of inquiry in which nothing is assumed but what is self-evident or has already been proved. The method was one revived, as Foucher saw it, by **René Descartes**, though not followed with sufficient rigor by him. Foucher (and on this Leibniz agreed with him) thought Descartes failed in his *Meditations* to **demonstrate** the existence of an **external world**. On this basis he also questioned some of the dogmas of **metaphysicians** such as Descartes, **Nicolas Malebranche**, and Leibniz himself. At the same time, he claimed that Academic skepticism did allow certain fundamental truths about **God** and the soul that were demonstrable.

Leibniz expressed a willingness to embrace Academic skepticism as expounded by Foucher, at least to the extent of declaring Foucher’s account of its **principles** to be those of “the true **logic**” (GP i 390). He even claimed that he himself followed its method of rigorous demonstration more strictly than his French friend did himself. But, unlike Foucher and perhaps contrary to the spirit of the skeptics, he thought that progress can only be made in the sciences if one is willing to proceed upon the basis of assumptions that have not yet been demonstrated. He claimed that, had **Euclid** refused to proceed without making undemonstrated assumptions, the Greek would not have made the progress he did in founding geometry. Leibniz thought the metaphysician should proceed on the same basis. At the same time, just as he respected the project of trying to prove the axioms of geometry, so he respected the project of the Academic skeptic who sought to demonstrate some of the axioms of metaphysics.

**ACADÉMIE DES SCIENCES.** The French Académie des Sciences began as an informal group associated with a friend of **René Descartes**, Marin Mersenne (1588–1648). It came into existence formally in 1666, when a number of salaried posts were created for

distinguished researchers, including **Christiaan Huygens**. Leibniz dedicated his *Theory of Abstract Motion* (part 1 of his *New Physical Hypothesis*, 1671) to the Académie and was involved in its activities during his stay in **Paris**, becoming a member in 1675. He hoped to obtain a salaried post with the Académie so that he could remain in Paris, one of the hubs of the intellectual world. But, though a post became vacant, he was passed over, possibly (it was suggested) because he was a foreigner or possibly, as **Bernard Fontenelle** suggested in his eulogy for him, because he was unwilling to convert to Catholicism. He later had a scheme, which he confided to **Simon Foucher**, of becoming a corresponding member who would advise on topics such as mining, justifying periodic visits to Paris. Nothing came of this scheme. After the Académie was reconstituted, however, Leibniz was elected a foreign member in 1701. The Académie was responsible for the first weekly scientific journal, the *Journal des Sçavans*.

**ACCIDENT (ACCIDENS/ACCIDENT)**. A technical term of **Aristotelian** and **scholastic** philosophy used to refer to those features of a thing that are not part of its **essence**. An accidental property of a thing would thus be any property that a thing would not need to have in order to be the thing it is. Leibniz inherited and made use of this term, explaining it himself by saying that “learned” is an accidental property of “man” if some men are learned and some men are not learned (GP vii 227; L 45).

Leibniz’s view that the **complete concept** of every individual **substance** contains everything that is true of it is sometimes expressed by saying that each individual substance contains all its “accidents” (see, e.g., GP ii 70). That view seems, however, to be tantamount to the view that all the properties of an individual are essential properties of that individual. This may be why some of his critics, including **Antoine Arnauld**, construed the complete concept view as committing Leibniz to **fatalism**.

**ACCIDENTAL UNITY**. See *UNUM PER ACCIDENS*.

**ACROAMATIC**. See *ESOTERIC*.

**ACTA ERUDITORUM.** An academic **journal** published in **Leipzig** between 1682 and 1731. It was founded by Otto Mencke, with support from Leibniz, and Mencke was editor until 1707. The *Acta* was originally a review periodical that gave summaries and excerpts (in Latin) from books that had recently been published. It also included short articles, however, and Leibniz was from the outset a frequent contributor, especially on **mathematical** and **physical** topics. His *Meditations on Knowledge, Truth, and Ideas* (1684), *Brief Demonstration* (1686), *Reform of Metaphysics* (1694), and *Nature Itself* (1698) were among the more important of his publications in the *Acta*. Leibniz admitted that he presented himself differently when writing for this journal, making more use of **scholastic** terminology, than when writing for those read by the **Cartesians**.

**ACTION (ACTUS).** Leibniz uses the term “action” or “activity” to refer to what is needed for the concept of a **corporeal substance** in addition to **extension**. All **substances** are active, according to him, and where there is no activity there is no thing (substance). Activity is contrasted with passivity, which Leibniz called “**passion**.” Activity, so far as the **soul** is concerned, is linked to **appetition** and passivity with **perception**. **Created** substances, even **angels**, are always passive to some extent and are possessed of **primary matter**. Only **God** is “pure activity” or, in Scholastic Latin, *actus purus*.

The concept of an action is linked to that of a **cause**. One debate that was prominent in late 17th-century philosophy and to which Leibniz thought he had made important contributions was about whether there are “actions” or “true causes” in the natural **order**. A number of **Modern philosophers**, including the **occasionalists**, denied this, holding that only God truly “acts.” Leibniz’s **system**, as propounded in his *Discourse on Metaphysics*, was introduced as partly motivated by the search for a satisfactory answer to this problem. He also addressed it in his later paper *Nature Itself*.

**ACTION AT A DISTANCE.** *See* CONTINUITY, LAW OF; FORCE; GRAVITY.

**ACTIVITY.** *See* ACTION.

**ADAMIC LANGUAGE.** The “Adamic” language is the one supposedly given by **God** to Adam. The story was that God taught Adam language, giving him the names of things, with the result that Adam was able to intuit the **essences** of those things. The Adamic language, and the **knowledge** of nature that came with it, was lost but, or so some thought, it might be possible to go some way to recovering it. Leibniz occasionally invoked the notion of an “Adamic” language but he was skeptical of the view that Hebrew or Arabic was close to it, agreeing with **Jakob Boehme** that Teutonic was a more “natural” and in that sense a more Adamic language. Leibniz’s purpose in referring to an Adamic language is usually to introduce his own project of constructing a language that would be scientifically more adequate. In a writing of 1686, for instance, he claimed:

If we had some exact language (like the one called Adamite by some) or at least a kind of truly philosophical writing, in which the ideas were reduced to a kind of alphabet of human thought, then all that follows rationally from what is given could be found by a kind of calculus, just as arithmetical or geometrical problems are solved. (A VI vi 204; SM 12)

*See also* CHARACTERISTIC, GENERAL/UNIVERSAL.

**AESTHETICS.** *See* BEAUTY; MUSIC.

**AGGREGATE (AGGREGATUM/AGREGAT).** For Leibniz the only real beings are true **unities**, entities that are essentially indivisible. These beings he contrasts with those that are no more than beings by aggregation, such as a flock of sheep or a band of musicians. Leibniz claims that a material thing, as such, is no more than a being by aggregation. Its reality depends on the reality of the beings of which it is composed. It is, for that reason, a **well-founded phenomenon** but no more than that. The existence of composite things (such as tables) is an argument, for Leibniz, that there must be simple **substances** or **monads**: “There must be simple substances, since there are composites; for the composite is nothing but an accumulation or *aggregate* of simples” (*Monadology*, §2). *See also* CORPOREAL SUBSTANCES.

**ALCHEMY (CHEMIA).** Leibniz took a considerable interest in alchemy as a young man, as was common for those who were en-

gaged in natural philosophy in the middle of the 17th century. Around 1666–1667 he was employed by an alchemical society in Nuremberg and was actively involved in the project of making gold. But alchemy was coming to be regarded more and more as a pseudoscience and so Leibniz tended, in his later years, to avoid reliance on alchemical ideas and to play down or even deny his former involvement in alchemical work. Nonetheless it is arguable that there were a number of features of Leibniz’s later **metaphysics** that remained congenial to alchemical thought: such as, that everything in the created **universe** is fundamentally **analogous** to everything else, has a **soul** as well as **matter**, is part of a hierarchy or **chain of being**, and is capable of undergoing a radical **transformation**.

The later Leibniz was probably inclined to dismiss the supposed transformation of base metal into gold sought by alchemists as **miraculous** in a bad sense. But miraculous (in a good sense) transformations remained important to his view of the origin and destiny of human beings. By his account, rational souls originate by a divine process of **transcreation**, which is a transformation of an animal soul. And his view of the afterlife was originally influenced by ideas drawn from alchemy. For instance, the alchemical idea that everything can be reduced to a spiritual **essence** or “flower of substance” played a key part in the formulation of his early thoughts about the possibility of the **resurrection** that he offered in a lengthy memorandum for Duke **Johann Friedrich** in 1671. The alchemical terminology is dropped in his later accounts, which are much more cautious, but Leibniz continued to believe that there is a “seminal principle” in all things that cannot be naturally destroyed but remains and allows them to undergo radical transformations. And he continued to believe that these transformations in the natural world were analogues for the transformations humans mysteriously undergo after they die.

**ALPHABET OF HUMAN THOUGHTS (ALPHABETUM COGITANDI).** Leibniz was much taken by projects in which it was thought possible to arrive at an **infinite** variety of complex things by the combination of a few simples. His “alphabet” of human thoughts consisted of those simple **ideas** that could be conceived only through themselves and so were not capable of further **analysis**. From these simple components, he thought all the rest of our ideas arose through

combination. *See also* CHARACTERISTIC, GENERAL/UNIVERSAL; COMBINATIONS, ART OF.

**ALTDORF.** A university town in the republic of Nuremberg. After he had been refused a doctorate in law by the University of **Leipzig** on the ground that he was too young, Leibniz matriculated at Altdorf in late 1666 and promptly submitted his thesis “On Difficult Cases in Law” (*De casibus perplexis in jure*). Some lawyers thought there were cases in law that admitted of no rational solutions and which should be decided by lots or by arbitration. Leibniz claimed that, in such cases, there always was an answer in **reason** that was to be found by considering the **principles** of natural **justice**. In a matter of months he had not only received his doctorate but had made such an impression that he was given to believe that a professorship was likely to come his way. Leibniz, however, had other things in mind. He soon accepted the patronage of **Baron Johann Christian von Boineburg** and moved to **Mainz**.

**ANALOGY (ANALOGIA/ANALOGIE).** In his later writings Leibniz frequently insisted that his “whole philosophy” was governed by the practice of conceiving unknown and “confusedly known” things by analogy with things that are distinctly known (A VI vi 490). “My great **principle** so far as concerns natural things,” he explained to one correspondent, “is that all things are at all times and places just as they are here” (GP iii 343). And indeed he was willing, on the right occasion, to extend the principle beyond “natural things.” At the most fundamental and general level, things differ only in degrees of **perfection** (A VI vi 71). This principle of uniformity in **nature** allows us to reason by analogy and to expect that if our body is endowed with a **soul** then it cannot be “the only thing so endowed that it is infinitely different from everything else” (GP iii 204; W 204). He concludes that everywhere in **matter** there are **souls** or active beings. Moreover our souls are intimately united with a **body**. And so it is throughout **creation** generally, the **universe** consisting of souls that are indissolubly united to bodies. There is a hierarchy of beings from bare **monads** to **animals**. Humans, made in the image of **God**, are at the top of this hierarchy in the familiar world but there are even more superior beings, like **angels**, that are still embodied souls even though their

**knowledge** is much superior to our own and they are less limited by their bodies. In an important letter to Gabriel Wagner of 1710 Leibniz sums up his view: “Everything in nature is analogous to everything else and what is subtle can be understood from what is coarse” (GP vii 530: cf. W 506). Leibniz’s principle that everything is analogous to everything else includes but does not reduce to the principle of the uniformity of nature, as is clear from his extension of the principle to the nature of angels. He thought we could have some analogical understanding even of the Christian **mysteries**, such as the **Trinity** and the **Incarnation**, though in the nature of the case this would be far from perfect. *See also* CHAIN OF BEING, GREAT; PLURALITY OF WORLDS.

**ANALYSIS (ANALYSIS/ANALYSE).** Leibniz was concerned with three different, though related, kinds of analysis in which a philosopher might engage: resolving complex *concepts* into their constituent simpler concepts; arriving at derivative *propositions* from **principles** that are already known; and deriving *phenomena* from an analysis of their **causes**. He frequently contrasted analysis with **synthesis**, in which the process goes the other way. He offered his correspondent Hermann Conring this formula: “Analysis is nothing other than when simple terms are substituted for complex ones, or principles in place of theorems” (GP i 205). Analysis is connected for Leibniz, therefore, with other important philosophical activities: those of **definition** and **demonstration**. As he put it to the same correspondent: “To define a compound idea . . . is to analyze it into its parts, just as to demonstrate is just to analyze a **truth** into other truths that are already known” (GP i 194; L 187).

The third kind of analysis is linked to the others, for Leibniz, since he held that causes contain their effects and so their effects can be derived from them. This in turn is linked with Leibniz’s fundamental thought that the predicate of every true proposition is contained in its subject term and so its truth is seen by analysis of that subject term. Again, for Leibniz, everything that is true of any **substance** is contained within (*inest*) its full concept and arises from within its own nature, though only **God** can complete the analysis required to know from the concept of any individual what will be true of it. *See also* *INESSE PRINCIPLE*.

**ANCIENTS.** A special respect for ancient philosophy was a feature of the **Renaissance** style of philosophy into which Leibniz was inducted as a student. A deference to ancient thinkers is commonly found in his writings and he invoked them, albeit defensively, even when writing for **Modern** readers. Though he opens his *New System*, for instance, by seeking to establish his Modern credentials—writing, for instance, of casting off the yoke of **Aristotle**—he still found himself invoking past philosophers. Considering the question of what becomes of the **soul** of an **animal** when it dies, he claims that there is “only one sensible thing to believe, that is, in not only the conservation of the soul but also in that of the animal itself” (§7). He was clearly aware of the oddity of this opinion since the common view was that animals suffered “complete extinction” (§8). This seems to have encouraged Leibniz to remark that his view that animals are merely **transformed** when they die had been held by several of the “ancients” who were, he goes on to stress, “sounder than we think” (§9).

Leibniz was curiously sensitive to the charge of **innovation**—perhaps because he was indeed putting forward a *new* theory in **metaphysics**. Taking himself to be charged with innovation by **Antoine Arnauld**—who had been sent the headings of his *Discourse on Metaphysics*—he replied that he usually found that “the most ancient and well received opinions are the best ones” (GP ii 20–21). He encouraged the resuscitation of the works of the ancients and sometimes even presented himself as a **resuscitator**. Among the ancients he particularly admired were **Pythagoras** and **Plato**. *See also* FREE-THINKER.

**ANGELS (ANGELI/GÉNIES).** Spiritual beings inferior to **God** but superior to humans. The Greek word from which *angel* derives means “messenger” and angels in the Christian religion are often represented as intermediaries between God and humankind. The Catholic tradition attaches importance to angels, but some Protestants do not believe in them.

Leibniz believed in angels but not in the way many of his contemporaries did and devout people may still do. In his *Examination of the Christian Religion* (c. 1686) he sought to defend the Catholic practice of praying to angels from the charge that it was philosophically unintelligible. But the actual, as opposed to possible, existence

of angels such as those who figure in the Christian tradition was not of importance to him personally. As for his philosophy, his principle of **plenitude** gave him some assurance that there ought to be rational beings greatly superior in **knowledge** and other capabilities to humans, less limited by reliance on the senses or hampered by the gross **bodies** humans have. Angels are, for him, beings of this kind. Leibniz writes about them often in terms of imaginary or hypothetical examples (such as an angel attempting to reveal one of the deeper secrets of **science**) and the modern reader might most profitably think of these examples as a kind of science fiction.

Like all other creatures, they still must have bodies of some kind, according to Leibniz, and indeed angels are able to assume a human form and so appear to humans, though in their true bodies they would be invisible to us, be able to pass through barriers impenetrable to us, and so on. Their knowledge also is much superior to that of humans, though still inferior to God's. God knows all truths *a priori* and without the need even to make calculations or run through arguments. The kind of knowledge angels have involves more of an a priori knowledge of the world than we possess and, for Leibniz, is closer to the kind of ideal to which human science might aspire. *See also* BEATIFIC VISION; CHAIN OF BEING, GREAT.

**ANIMALS (ANIMALIA/ANIMAUX).** Animals are not, for Leibniz, the lowest form of living thing. There are living things throughout the world, according to his mature view—even the simplest **substances** or **monads** have **entelechies** and therefore **bodies**. The term *animal*, probably in deference to established usage, is reserved by Leibniz for more complex living things that are composite substances. He sometimes drew the distinction by saying that animals, unlike bare monads, have organs like an eye that allow them to have sensations and that they are capable of some **memory**. The dominant monad of an animal is a **soul**. In his later writings, Leibniz was scornful of the **Cartesian** view that animals have no feeling and that they are *mere* machines. Though he had earlier toyed with the thought that it could not be proved that animals have sensations, his later view seems to have turned on an empirically based distinction between living things that had the right organs and those that did not. The distinction is not clear and indeed it is not essential to Leibniz's philosophy that it

should be. On the contrary it seems to have been a consequence of his belief in the **plenitude** of the world that it should contain an **infinite** gradation of species from bare monads up to the most complex animals.

An animal, for Leibniz, is a **corporeal substance** in which a dominant soul or monad confers **unity** on what would otherwise be a mere **aggregate** of monads and makes it into one “machine” (AG 177; GP ii 252). Since animals, according to Leibniz, have souls and souls have essential unity, they are all “naturally immortal,” that is, cannot cease to exist through natural processes and could only be destroyed should **God** decide to **annihilate** them. **Generation** and **death** are only phases of **transformation** of the same animal, **analogous** to that from the caterpillar to the butterfly state.

Humans are a kind of animal, according to Leibniz, though one of a very superior kind. Humans are specially privileged animals since God has given them rational souls and the capacity for **apperception** and for **knowledge of eternal truths**, including the **truths of ethics**. Leibniz vacillated between saying that human souls were a special **creation** and—what seems to be his more considered view—that human souls are animal souls on which the gift of rationality has been at some stage divinely conferred by a process he dubbed **transcreation**. Human beings are also exempted from the transformations of nature and do not, after they die, become another kind of being. Nonetheless the transformations of nature (e.g., of caterpillar to butterfly) are indeed analogues for Leibniz of what Christians believe in who hope that after they die they will be **resurrected**. Thus Leibniz sought both to acknowledge that humans are a kind of animal and to allow them the very special status they have as beings made in the **image of God** and destined to be members of the **City of God**. *See also* CHAIN OF BEING, GREAT; ORGANISM; VACUUM AMONG FORMS.

**ANNIHILATION** (*ANNIHILATIO/ANNIHILATION*). The opposite of **creation**, that is, the cessation of **existence**. The term is not, however, synonymous with **death**. “Death” is, according to Leibniz, a “mere **transformation**” of **corporeal substance**—the rapid contraction of the extent and vivacity of the material aspect of corporeal substance, which results in the shedding of the gross or visible **body**. Corporeal substances are transformed but never annihilated or cre-

ated, because every soul or dominant **monad** of a corporeal substance is always the active **principle** for a collection of monads, no matter the extent to which it shrinks away. It is an **axiom** of Leibniz's that whatever is a collection of other things is not a true being itself. Only monads, as simple unconstituted **substances**, are real beings. Consequently, only monads can cease to exist or be annihilated. "Thus, one can say that monads can only begin or end all at once; that is, they can begin only by creation and end only by annihilation, whereas that which is composite begins and ends part by part" (*Monadology*, §6). This could not happen "naturally" but only by the removal of the divine sustenance, which is the **sufficient reason** for the existence of monads. However, because **God's** goodness requires that he maintain the created world in existence, along with each and every monad that plays its role in making it the best **possible world**, it is difficult to see how God would in any circumstance annihilate any monad. Hence, like the **atoms** of the **ancients**, Leibniz's simple substances seem to be coeternal with the whole of **nature**.

**ANSELM OF CANTERBURY (1033–1109).** Medieval philosopher and theologian. Although born in Piedmont, he eventually became archbishop of Canterbury. Anselm is known within the history of philosophy as the person who first put forward the **argument for the existence of God** later known as the **ontological argument**. Anselm, in his *Proslogion*, begins from our concept of God as "that than which a greater cannot be thought." This is the **idea** we have in our mind (*in intellectu*). If we ask whether God actually exists, we are asking whether this being of which we have this idea exists in reality (*in re*). If we suppose not, he argues, then we could still conceive a being greater than the one we have in mind. Our position would then be the absurd one of conceiving something greater than that than which a greater cannot be thought. The "fool" of the Bible who says in his heart that there is no God, is therefore a stupid fool. God must exist to be that than which a greater cannot be thought.

Leibniz knew something of Anselm's argument as well as about the controversy it engendered among the **scholastics**. He claimed to be familiar with the objections of **Thomas Aquinas**, whom he interpreted generously though tendentiously as putting forward his own objection—that Anselm assumes that the concept of God is possible,

that is, is free of **contradiction** (A VI iv 542: cf. P 13). In the 17th century the argument was put forward again by **René Descartes**, with no acknowledgment to Anselm. Leibniz constantly insisted, however, that Descartes merely revived Anselm's argument. It could be said in Descartes's defense that it is his version of the argument, which turns on God possessing all the **perfections**, that Leibniz himself considers. Anselm's argument turns on God being, by definition, that than which a greater cannot be thought. But Leibniz's view of a perfection is of an **attribute** that admits of degrees and is without limit in God. Hence it is his own version of the argument that is more obviously Anselmian in inspiration than was that of Descartes.

**ANTITYPY (ANTITYPIA).** A Greek word used by Leibniz to mean resistance to penetration. Leibniz rejected the **Cartesian** view that the **essence** of **matter** consisted of **extension**. Antitypy was another property he thought was essential. He sometimes claimed that the essence of **body** consisted of extension together with antitypy (A VI ii 443).

**A POSTERIORI.** A technical Latin phrase that refers to **knowledge** gained through experience. It is contrasted with *a priori* knowledge. For some **empiricists**, the only knowledge worthy of the name is *a posteriori*. Leibniz accepted that most knowledge was *a posteriori*, and he was willing to endorse **Baconian** methods of **induction**. It was a feature of his method that he often used both *a posteriori* and *a priori* arguments for the same conclusion, for example, in his **arguments for the existence of God** or for his view that **animals** do not strictly cease to exist when they die but are only **transformed**. But, while *a posteriori* arguments were important for Leibniz, he preferred *a priori* arguments where they were available, since he regarded them as stronger. He also put a premium on the human capacity for *a priori* knowledge, since it involved knowledge of **eternal truths** and was a mark of the special position humans enjoyed in the **chain of being**.

**APPEARANCES.** See PHENOMENALISM.

**APPERCEIVE (APPERCEVOIR).** See APPERCEPTION.

**APPERCEPTION (APPERCEPTION).** Term first used by Leibniz in his *New Essays* to distinguish those **perceptions** of which creatures are conscious from those of which they are not. The term is also used to distinguish creatures that are capable of reflection and are self-aware from those that are not. These are not quite the same distinction, as becomes apparent if one considers complicated **animals**. Leibniz too readily supposes that creatures capable of apperception are able to have **knowledge** of **eternal truths**. But a case can be made for supposing that some (other) animals are conscious, even self-aware, though they do not have knowledge of eternal truths such as those of **arithmetic** and geometry.

**APPETITION (APPETITIO/APPÉTITION).** Together with **perception**, this is one of the basic qualities of a **monad**. It is the internal principle that tends to produce change in the perceptions of a monad. Leibniz denied that the changes in the perceptions of monads were due to external causes, since nothing other than **God** can act on monads. Each monad is therefore in a sense the **cause** of its own perceptions. *See also* SPONTANEITY.

**A PRIORI.** A technical Latin phrase that means, literally, “in advance.” *A priori* **knowledge** is that gained independently of experience. Certain of the **sciences**, including **ethics**, **jurisprudence**, **arithmetic**, **metaphysics**, and geometry were, for Leibniz, *a priori*. These sciences, he believed, provide us with **eternal truths**. Other sciences made use of important *a priori* **principles**, such as that **nature** does not operate by leaps or have gaps but, on the contrary, conforms to a law of **continuity**. Many of Leibniz’s most characteristic principles were *a priori*, such as the principles of **contradiction**, **identity**, **sufficient reason**, **perfection**, and **plenitude**. But, though he thought these principles were important, he recognized that by far the greater part of human knowledge was **empirical** or *a posteriori*. Only **God**’s knowledge of the world is entirely *a priori*. He knows what will happen to each individual **substance** because he knows what is contained in its **complete concept**.

**AQUINAS, THOMAS (c. 1224–1274).** One of the great doctors of the Christian Church. Aquinas, in his *Summa Theologiae* and other writings,

sought to reconcile a broadly **Aristotelian** philosophy with an acceptance of Christian belief. He came to enjoy a special position of respect among Catholic thinkers, and his authority was given particular recognition by the Jesuits. Aquinas and his followers, known as “Thomists”—including such figures as **Francisco Suárez** and Luis de Molina—were a major presence in a tradition of **scholastic** philosophy and theology that extended to the Protestant parts of Germany. Leibniz admitted, in a letter to Princess **Elizabeth of Bohemia**, that he had in his youth been “well versed in the subtleties of the Thomists” (A II i 433; AG 236). Their discussions of topics such as the origin of **souls**, the origin of **evil**, the **concurrence of God**, and the compatibility of divine foreknowledge with human **free will** were an important influence on him as he developed his thoughts on these topics, thoughts that eventually found fruit in his *Theodicy*.

Leibniz, probably because of his concern with **Church unity**, treats Aquinas with a special deference. He acknowledges him as an authority figure whose support for a doctrine like one of his own was evidence of the **truth** of his own position. This can be confusing, since it leads him to play down points of disagreement. Even though he strongly opposed the scholastic doctrine of **separated souls**, for instance, he never held Aquinas to account for its prevalence. He claimed on several occasions that Aquinas’s view of “separated intelligences” such as **angels** was similar to what he held about all **substances**, in accordance with his principle of the identity of **indiscernibles**—namely, that they never differ only numerically and that no two are exactly the same. Leibniz gave no hint that he rejected the idea of disembodied intelligences apart from **God** and so was being a little disingenuous in invoking the support of Aquinas for his own view. But there are many points of real agreement between the two philosophers. Aquinas exerted a great, though mostly indirect, influence on Leibniz through his important contributions to the **natural law** tradition as well as to the scholastic tradition of **natural theology**. Thus Leibniz’s philosophical theology is broadly similar to that of Aquinas as is, for instance, his account of **faith and reason** and his theodicy.

**ARCHÉ (ARCHEUS)**. From a Greek word meaning “origin” or “beginning,” this term was used by some ancient Greek philosophers to

signify an original **principle** that continues to govern the working of the **universe**. The term was taken up by 16th- and 17th-century **vitalists** such as Paracelsus, Robert Fludd, Jan Baptista van Helmont, and **Henry More** to signify a spiritual principle required for the explanation of natural phenomena. The idea of an *arché* was linked to that of a **world soul**. Leibniz, as a **Modern philosopher**, was committed to the sufficiency of mechanistic explanations of natural phenomena and so opposed to the introduction of spiritual principles in the natural **sciences**. Despite dismissing the appeal to an *arché* as involving a *deus ex machina*, however, Leibniz was sympathetic to the vitalists, claiming that his **system** could make sense of those “who put life and perception into everything” (*New Essays*, A VI vi 72). *See also VITAL PRINCIPLES AND PLASTIC NATURES, THOUGHTS ON.*

**ARGUMENT FROM DESIGN.** *See TELEOLOGICAL ARGUMENT.*

**ARGUMENT FROM ETERNAL TRUTHS.** An **argument for the existence of God**. Leibniz claims that the **eternal truths** cannot exist except as the thoughts of a mental **substance**. That we do conceive of the eternal truths as existing implies that an eternal mind who thinks them must also exist. Leibniz identifies **God’s** mind as the region of the eternal truths. According to his **creation** theory, prior to their creation, contingent actual existents of the world must have had only possible existence—as mere thoughts of things. Therefore, if there had been no mind to think of **possible worlds**, there could not have been an actual world. “God’s understanding is the realm of eternal truths or that of the **ideas** on which they depend; without him, there would be nothing real in possibles, and not only would nothing exist, but nothing would be possible either” (*Monadology*, §43). Leibniz associated the realm of ideas in God’s mind with **Plato’s** theory of forms. Though he considered this argument an important innovation of his own, there had been precedents for it, for example, in **Jacques-Bénigne Bossuet**.

**ARGUMENTS FOR THE EXISTENCE OF GOD.** Philosophers, following Immanuel Kant, commonly divide arguments for the existence of **God** into three main kinds: **ontological**, **cosmological**, and

**teleological arguments** (the last usually known as the “argument from design”). Leibniz did not use these terms, but these three types of argument are nevertheless recognizable in his writings. His argument from **eternal truths** might be represented as a form of cosmological argument but it is here treated separately.

God’s existence is of importance to Leibniz’s **metaphysical system** in several ways. First, his **definition of substance**, as the metaphysical correlate of the **complete concept** of a true proposition, requires the existence of an infinite mind. Second, his treatment of the world, as consisting of a plurality of contingent substances, needs a necessarily existing substance as **sufficient reason** for this world. In arguing for the existence of God from (already) existing contingent substances—arguing, that is, *a posteriori*—Leibniz advances what is usually called the cosmological argument. Sometimes he supplements this with a version of the argument from design, the **order** supposed to be “implicit” in the world being that of the **preestablished harmony**. These *a posteriori* arguments depend on the acceptance of the **principle** of sufficient reason, which both creates a need for a proof of God and, in identifying him with it, provides the solution.

When seeking to prove God without reference to existing things—that is, *a priori*—Leibniz takes two distinct lines of argument. The first is known as the **argument from eternal truths**; the second is the ontological argument. Regarding the second, Leibniz modifies the original **Anselmian** argument by introducing an extra proof concerning the very possibility of the definition of God as “the most perfect being.” But Leibniz’s preferred argument, and perhaps the most convincing, is a variant of the ontological argument that may be termed the *modal argument*, in which the definition of God is changed to that of “the necessary being.”

**ARISTOTLE (384–322 B.C.).** An ancient Greek philosopher of such stature that he was referred to by **scholastic** philosophers simply as “the Philosopher.” In German universities in the early 17th century Aristotle was widely deferred to on matters of natural philosophy. Leibniz was taught to regard Aristotle with the highest respect and sought to reconcile Aristotle’s thought with that of the **Modern philosophers**. He wrote a letter to his former teacher **Jakob Thomasius** in which he tried to show how, contrary to the scholastic inter-

pretation, Aristotle's **abstract** theories of **matter**, form, and change could be explained by "magnitude, figure, and **motion**" (A II i 164; L 94–95). In seeking to reconcile Aristotle with the new philosophy, Leibniz was following the example of another former teacher, **Erhard Weigel**.

Leibniz probably referred to Aristotle in his writings more often than to any other philosopher. To some extent, this was a measure of Aristotle's continuing importance in 17th-century German philosophy. Especially in his philosophy of the natural world, Leibniz made frequent use of Aristotelian terms, such as primary matter, **substantial form**, **substance**, and **entelechy**. But, though he made use of Aristotelian terminology in expounding his **metaphysics**, especially in writing for readers who had an academic background, he was not bound by the terminology and was to some extent liberated from the conceptions attaching to it.

Some Modern philosophers became hostile to the very terminology of the scholastics, and the laypeople—who were becoming an increasingly significant element of the readership of philosophical books—were unfamiliar with it. Leibniz, in his popular writings and in those directed to a "Modern" readership, sought to express himself in other ways. In his later writings, he introduced his own Greek-based neologisms such as "**theodicy**" or adapted Greek terms such as **monad** for his own purposes. Nonetheless he still glossed the term *monad* as a "simple substance" and retained a conception of substance that was, in part, profoundly Aristotelian—as a subject of predication. At the same time, his conception of the world as consisting fundamentally of true **unities** and therefore of *simple* substances or monads owes more to the **Platonic** tradition.

**ARITHMETIC.** The science of numbers based, as Leibniz understood it, on the two fundamental numbers 1 and 0. Leibniz conceived of the **truths** of arithmetic as **eternal truths** whose highest **principle** was that of **contradiction**. Any arithmetical truth could be reduced to a tautology or statement of identity by a series of **definitions**. Thus if "2" is defined as "1 + 1," "3" as "2 + 1," and so on, any correct sum would be reducible to a statement of identities. Thus, for example, "3 + 2 = 5" could be reduced in a few steps to "3 + 2 = 3 + 2." *See also* ABSOLUTE NECESSITY; BINARY SYSTEM; CALCULATING MACHINE.

**ARNAULD, ANTOINE (1612–1694).** French philosopher and theologian, the leader of an influential Catholic faction called the “Jansenists,” who emphasized **Augustine’s** doctrine of grace. Arnauld was the author of a set of objections that was published with **René Descartes’s** *Meditations* and to which Descartes himself replied. One of the difficulties he raised—whether an account of the **Eucharist** could be given in **Cartesian** terms—became a standard objection from the standpoint of Catholic theology. Arnauld was not hostile to Cartesianism, however, and was coauthor (with Pierre Nicole) of *La logique; ou, L’art de penser* (1662), which expounded a Cartesian theory of **clear and distinct ideas**. Arnauld later became involved in a controversy with **Nicolas Malebranche** about the nature of **ideas**.

Leibniz had a very high respect for Arnauld as a philosopher and this was, as it turned out, reciprocated. He hoped that Arnauld might be instrumental in forwarding his ambitions for reconciling the Lutheran and Catholic churches. Leibniz believed that his **metaphysics** could play a key role in promoting **Church unity**. He wrote Arnauld a lengthy letter in 1671 and had planned to approach him personally when he arrived in **Paris** that year, but had to change tack when news reached him of the death of his employer, the archbishop-elect of **Mainz**. When, in 1686, he took up his ecumenical interests again and returned to his *Catholic Demonstrations* project, he wrote his *Discourse on Metaphysics*. Through an intermediary, **Ernst von Hessen-Rheinfels**, he sent Arnauld a summary of its main points. Though Arnauld was initially shocked at what he saw as a tendency to **fatalism**, Leibniz convinced him that his view that every **substance** had a **complete concept** from which could be deduced all that happens to it, was not fatalistic. There was a lengthy **correspondence** in 1686–1687, but Leibniz did not write for two years while on his travels to Italy and, although he wrote again from Venice in 1690, providing Arnauld with a new summary of his **system** (GP ii 131–38; L 359–61), Arnauld was by then in decline and did not respond.

Though Leibniz’s starting point in the correspondence was that of the *Discourse*, his thought seems to have developed in response to Arnauld’s questions and the expositions in his letters to Arnauld contain modifications and new elements. The correspondence thus represents a transitional phase between the *Discourse* and the first pub-

lished statement of his mature philosophy, the *New System*. In the letters to Arnauld of 1686–1687, Leibniz offered an account of **corporeal substances** that he thought was one of which, unlike the Cartesian account, a Catholic theologian might approve. He invoked the **scholastic** notion of a **substantial form** and the doctrine that the **soul** was the substantial form of the human **body**. Leibniz argued against the Cartesians that the nature of corporeal substance cannot consist of **extension** alone, since a substance must be a true **unity** and whatever is extended can be divided and so is not a true unity. Every corporeal substance must therefore be endowed, he concluded, with a substantial form that makes it that individual substance. Arnauld asked pointedly what happens to its substantial form when a block of marble is cut in two. Leibniz had no satisfactory answer to this, nor was he willing to say at that stage that the only substances were living things. By his letter of 1690, in which he claimed to summarize his position, he had moved on to his later view that a corporeal body is an **aggregation** of substances and not itself a substance, strictly speaking.

Leibniz was, in the end, well pleased with this correspondence and at one time had plans to publish it, together with his *Discourse*, as a statement of his considered views about metaphysics. These plans were overtaken by the publication of his *New System* and the published correspondences relating to it. But the *Discourse* and the correspondence with Arnauld remain among the best introductions to Leibniz's mature philosophy.

**ART OF COMBINATIONS.** *See* COMBINATIONS, ART OF.

**ART OF DISCOVERY.** *See* DISCOVERY, ART OF.

**ASTROLOGY.** *See* INCLINING WITHOUT NECESSITATING.

**ATHEISTS (ATHEISTI).** The term *atheist* was used rather loosely in the 17th century to refer to people who did not believe in or were committed to denying the **God** of orthodox Christianity or even those who denied the **immortality** of the **soul**. **Benedict de Spinoza** was considered a notorious atheist in this broad sense, despite the fact that he produced a highly God-centered **system** of **metaphysics**. Both **deism** and **pantheism**—terms not in common use in the 17th century

(and not used by Leibniz)—might be classed as forms of atheism in the broad sense rather than, as nowadays, as alternative points of view.

Leibniz's reflections on the question whether the philosophy of **Descartes** led to atheism (*athéisme*) throw light on his use of the term. He mentions, as evidence that it *did* lead to atheism, passages in which Descartes rejects the use of **final causes** in **physics** and where he appears to hold that **matter** eventually assumes all the forms of which it is capable (GP iv 281; L 272). The suspicion was that Descartes denied purpose in **nature** and held that everything that happened came about by blind necessity, committing him to a new **Stoicism** in the company of Spinoza (GP iv 334; MB 105). The nub of the charge of atheism—which Leibniz was reluctant to press—is not that Descartes did not genuinely believe in a god of sorts but rather that he was committed to denying a Providence, that is, a purposeful ruler of the **universe**.

More generally, Leibniz seems to have shared the concern of many of his contemporaries that the **mechanical philosophy** encouraged people not to believe in a providence or in a future life. He seems to have used the word *atheist* particularly of those who accepted **materialism** and **naturalism**. In his *Confession of Nature against the Atheists* he argued that accepting the **Modern philosophy** did not mean embracing atheism. He claimed, on the contrary, that it would not be possible to explain the **primary qualities** in terms of which the mechanical philosophy sought to explain phenomena without reference to an incorporeal **principle**. Those who postulated **atoms** as the irreducible elements of the world could not explain either the indivisibility of atoms or the cohesion between them without such a principle. Thoroughgoing materialism and the atheism it involved was thus not a philosophically defensible position.

Leibniz accepted a number of **arguments for the existence of God**. But he would not have regarded all of them as refutations of what he understood by “atheism.” Descartes's **ontological argument**, for instance, would not have served as such a refutation for Leibniz even once it had been shored up in the way he thought necessary. Atheists, as he understood the term, might believe in the god of the ontological argument. Other arguments such as the **teleological argument**, however, might serve the purpose of countering athe-

ism and no doubt confirmed Leibniz in the view that it was not a philosophically defensible position.

**ATOM (ATOMUS/ATOME).** A basic unit that cannot be further subdivided. Leibniz sometimes referred to his **monads** as “atoms of **substance**” or “true **unities**” that are without parts and are therefore indestructible by natural means. But unqualified references to “atoms” in his writings are to material atoms and so to the **atomism** of **Democritus** or its modern revivers. Leibniz had initially been drawn to the atomism of **Pierre Gassendi** when still a student and sought to accommodate atoms in his thinking as late as the early 1670s. But he later denied that there were (material) atoms, both because atoms as generally conceived violated his principle of the identity of **indiscernibles** and also on the ground that there are no bodies so small that they are not actually subdivided. Leibniz frequently stated, from the time of his *De summa rerum* on, that there was no particle of **matter** too small to contain further particles and indeed that each particle contained an infinite number of creatures. He supported this claim by an appeal to his principle of **plenitude** and therefore to the **perfection** of the world. *See also* VACUUM.

**ATOMISTS (ATOMISTI).** Those who accepted the view that the world consists of material **atoms** that move in a void or empty space. This view, expounded by ancient Greek philosophers such as **Epicurus** and **Democritus**, was revived during the **Renaissance**. **Modern philosophers**, such as **Pierre Gassendi** and **Gérauld de Cordemoy**, developed atomism in a way that was found useful for the emerging empirical **sciences** by **Robert Boyle** and others. Despite Gassendi’s efforts to reconcile atomism with belief in **immortality**, it was widely seen as a **materialistic**, and so antireligious, doctrine. Philosophically it required belief in a **vacuum**, which some philosophers, including **René Descartes**, rejected.

Leibniz himself seems to have undergone some kind of conversion to Modern philosophy in an atomistic form when he was a student, following Gassendi. “At first,” he wrote in his *New System*, “when I had freed myself from the yoke of **Aristotle**, I had believed in the void and atoms, for it is this that best satisfies the imagination” (§3). But he later rejected atomism, accepting a **plenum** rather than a vac-

uum and claiming that the ultimate realities must be true **unities**—what he called **monads**—and not physical entities that could be further divisible. An objection he frequently made to atomism is that it requires one to believe that some things differ only numerically. Belief in atoms was thus inconsistent with his principle of the identity of **indiscernibles** and ultimately with regarding the **universe** as the product of a perfect **Creator**.

**ATTRIBUTE** (*ATTRIBUTUM/ATTRIBUT*). Leibniz defined an attribute as “the predicate in a universal affirmative proposition of which the name of a thing is the subject” (C 241; L 38). He illustrates this by two examples: being **just** is an attribute of **God**, and being a multiple of 2 is an attribute of being a multiple of 30. These examples conform to a stricter usage according to which an attribute is a property of a thing that is not part of its **definition**.

**AUGSBURG CONFESSION**. The first of the Protestant confessions, drafted by Martin Luther’s friend and theological ally Philip Melancthon and presented in 1530 by the “Lutheran” princes of Germany to the Holy Roman emperor. Leibniz referred to Lutheran theologians as “theologians of the Augsburg Confession.” He himself was born a Lutheran and, in spite of his Catholic sympathies, he refused to convert to Catholicism even when there was a prospect of a post (such as that of librarian at the Vatican) that would have attracted him. For most of his life, he was active in seeking the reunion of the Lutheran and Catholic churches. Nonetheless he did not himself take communion in the last 19 years of his life, according to his first biographer and one-time secretary, Johann Georg von Eckhardt. This suggests that his Lutheranism was not so much a personal position as a political one. *See* CHURCH UNITY.

**AUGUSTINE OF HIPPO (354–430)**. One of the Church Fathers and a key intellectual figure in the transition from classical antiquity to the Christian world of the Middle Ages. Augustine was of particular importance for the absorption of **Platonic** and **Neoplatonic** notions into Christian theology. In the 17th century his prestige was immense, especially among philosophers in the Catholic tradition who were sympathetic to **Modern philosophy**, such as **Nicolas Male-**

**branche** and **Antoine Arnauld**. Among other notions they inherited, as did Leibniz, was the idea of divine illumination, that **God** is the light of the **soul**. Malebranche’s doctrine of “**seeing all things in God**,” to which Leibniz claimed he could give a good sense, drew its inspiration from Augustine. Despite his unwillingness to acknowledge his debts to past philosophers, it seems that **René Descartes** was also indebted to Augustine for his *Cogito* and for his perception, accepted also by Leibniz, that the **existence** of intelligible things, including the self as a thinking thing, was more certain than the existence of the objects of the senses.

Leibniz seems to have been persuaded by **Simon Foucher** that Augustine, so far from being a critic of **Academic skepticism**, was a leading figure in its development. He assured Foucher that “the laws of the academics that you express by the words of St. Augustine are those of the true **logic**” (GP i 390). In this spirit he quoted Augustine with approval as saying: “Do not permit yourself to think you have known **truth** in philosophy, unless you can explain the step by which we infer that one, two, three, and four make ten” (GP vii 166; W 37). But Leibniz also appealed to Augustine in order to qualify his respect for the rigorous demands of the skeptic. He frequently referred, for instance, to one of Augustine’s less well-known works, *The Utility of Believing*, in order to support a pragmatic tendency in his own epistemology in opposition to those who refused to believe without proof.

It is not clear how far there are points at which Leibniz was actually influenced by Augustine and how far he was exploiting the willingness of others to defer to him, insinuating his own thoughts by associating them with Augustine. He adopted the phrase “**City of God**,” referring to his heavenly community of all spirits, from the title of one of Augustine’s most famous books—his *Civitas Dei*. But there is not much, apart from the name he gave to it, that is Augustinian about Leibniz’s conception. Nevertheless, Leibniz’s own Neoplatonism owed a great deal, at least indirectly, to Augustine and a large number of important assumptions he made—such as those about **emanation**, **plenitude**, the great **chain of being**, **evil** as a limitation of **created** beings—probably owe their unquestioned presence in Leibniz’s philosophy to the continuing immense influence of Augustine in his own time. *See also* BELIEVING, USEFULNESS OF.

**AVERROËS.** *See* AVERROISTS; IBN RUSHD, ABU AL-WALID MUHAMMAD.

**AVERROISTS.** A term in use in Leibniz's time to refer to the followers of **Ibn Rushd**, also known as Averroës. Foremost among the distinctive doctrines of Averroism was the *twofold truth*, according to which what was false in philosophy (e.g., **immortality**) might be true in religion. Leibniz strongly opposed any such tendency to set **faith and reason** in opposition to one another. He therefore attacked Averroism in the *Preliminary Dissertation* to his *Theodicy* (§§7–11). The Averroists were associated with doubts about immortality and, in particular, with the view that the **soul** does not retain its individual identity after death but instead is absorbed into the **world soul**. Leibniz attacked this doctrine in his 1702 paper *Reflections on the Doctrine of a Single Universal Spirit* (G vi 529–38; L 554–60).

**AXIOM (AXIOMA/AXIOME).** A proposition laid down as a starting point for argument. Axioms were commonly supposed to be self-evident. True axioms are, in Leibniz's words, "by their nature indemonstrable." And yet many propositions that were accepted as axioms were in fact demonstrable from more fundamental axioms. These Leibniz sometimes referred to as "secondary axioms." Though the distinction between axioms proper and those commonly taken as such is important, it is often necessary to infer the sense in which Leibniz is using the term from the context. He regarded the **principle of contradiction** as the highest principle of all **eternal truths** and thus as a "primitive axiom" on which all such **truths** depend. The principle of **sufficient reason** is another primitive axiom in Leibniz's **system**. *See also* DEMONSTRATION; PRIMARY TRUTHS.

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**BACON, FRANCIS, VISCOUNT ST. ALBANS (VERULAM) (1561–1626).** English philosopher and statesman, often referred to as the father of "experimental" or **empirical** philosophy. Bacon was a man of affairs, becoming lord chancellor under James I, but his international reputation rested more on his books, such as his *De Aug-*

*mentis Scientiarum* (1623) and *The New Atlantis* (1624). He made a celebrated comparison of the traditional philosopher to the spider that spins marvelous creations out of itself that have no connection with reality. The mere “empiric,” by contrast, he likened to the ant that collects masses of raw materials but is at a loss as to what to do with them. The true philosopher should, he claimed, be like the bee that collects his materials knowing how to make something of value out of them. This homely recommendation is given substance by Bacon’s “Tables of Investigation,” methods of scientific inquiry that John Stuart Mill found it hard to improve on when he took them up more than two centuries later.

Bacon was an important early influence on Leibniz, who liked his pleasant and easy style and had the highest opinion of his *Advancement of Learning* (1605) and *The New Organum* (1620). Leibniz accepted the **Modern** view of Bacon as one of the liberators of philosophy from its monopoly by **scholasticism**. He particularly valued Bacon’s stress on cooperative activity in the **sciences** and on the need for scientific institutions to promote the growth of science. In the early 1680s Leibniz wrote an outline for a small book on “the Elements of Natural Science” (A VI iv 1993–2010: selections in L 280–89) from which it is clear that he knew and in some measure accepted Bacon’s methods of experimental inquiry. *See also* BOYLE, ROBERT.

**BASNAGE DE BEAUVAL, HENRY (1656–1710).** A French Protestant who was born in Rouen but took refuge in the Netherlands in 1670. He wrote a history of Protestantism. Basnage de Beauval took over the *Nouvelles de la République des Lettres* from **Pierre Bayle** in 1687 and renamed it *Histoire des Ouvrages des Savants*. He met Leibniz when on a visit to **Hanover** in 1692 and they discussed a wide range of issues that they pursued in a **correspondence** that continued until 1708. Basnage de Beauval was evidently unconvinced by the proposals of Leibniz’s *New System* and drew from him a further explanation that was published in his journal (AG 147–49; GP iv 498–500). It is one of the places where Leibniz compares the correspondence of his autonomous and noninteracting **substances** with clocks, which also agree perfectly with one another. It is also the first occasion on which he actually used the phrase “**preestablished harmony**” that was to become his favored way of identifying his new

hypothesis to distinguish it from **interactionism** (“the way of **influence**”) or **occasionalism**.

**BAYLE, PIERRE (1647–1706).** A French Protestant who sought refuge in the Netherlands, becoming professor of history and philosophy at Rotterdam. Bayle first became famous as the founding editor (1684–1687) of a major journal, the *Nouvelles de la République des Lettres*, in which his well-received reviews of new books appeared. He consolidated and further enhanced his reputation by his *Dictionnaire historique et critique* (1696 and many later editions), a rambling work of great wit and erudition. Bayle discussed a wide range of authors and doctrines in a way that was widely appealing.

Leibniz’s patronesses, the electress **Sophie** and her daughter **Sophie-Charlotte**, took a particular interest in Bayle, even going to visit him in the Netherlands in 1699. They naturally sought Leibniz’s opinions about his views and Sophie-Charlotte liked him to commit them to writing so that she could think about the issues for herself. And, according to Leibniz’s account in the preface to his *Theodicy*, she seems to have played a major role in encouraging him to write drafts of his criticisms of Bayle’s philosophy of religion around the turn of the century. These discussions of Bayle were eventually reflected and perhaps to some extent incorporated in part 2 (*Theodicy*, §§107–240), which is devoted exclusively to detailed replies to Bayle. The apparently disproportionate amount of attention to detailed criticism of another author might be seen as a defect in a work intended for the general reader. It shows not only Leibniz’s preoccupation with Bayle’s thought but also his judgment of its importance as perceived by his reader. He disagreed fundamentally with him on matters of philosophical theology. He strongly disapproved of Bayle’s divorce of **faith** from **reason** and his sympathetic statement of the Manichean heresy, according to which the world is fundamentally **dualistic**, with an independent power of **evil** struggling against the forces for good. Against Bayle Leibniz defended the view that faith, though it goes beyond reason, must always be consistent with it and have some support from it. He also offered an alternative view of the origin of evil.

Bayle had been the first writer of consequence to take note of Leibniz’s **system** (in his entry on “Rorarius” in *Historical and Critical*

*Dictionary*). His fair though critical attention resulted in amicable exchanges between the two philosophers, with Bayle giving further attention to Leibniz in later editions and in other books and contributing his part in some of the Dutch journals. A good selection is included in translation in WF 68–132.

Leibniz admired Bayle’s facility for stating skeptical arguments, which he seems to have found a stimulus to his constructive theorizing. Thus, when he had considered publishing his “system” concerning the freedom of man and the **concurrence of God**, he had in mind to submit it to Bayle’s scrutiny. And it is clear from the draft preface to his *Theodicy* (Gr 495) that he envisaged a further series of exchanges with those who were in controversy with him. Bayle died too soon from Leibniz’s point of view but, as he put it, the matter was “on the table” and so he went ahead with publication.

**BEASTS.** *See* ANIMALS.

**BEATIFIC VISION (*VISIO BEATIFICA*/VISION *BÉATIFIQUE*).**

A phrase used in Catholic theology of the direct vision of **God** granted in heaven to the blessed. This doctrine was rejected by some Protestants but Leibniz thought that a “good sense” could be given to it. He offered this gloss on the doctrine in his *Examination of the Christian Religion*:

Even in the present state, **God** is the light of our **soul**, and the only immediate external object of our intellect; in the present state, however, we see all things “*as in a glass*,” the ray of thought being, as it were, reflected or refracted by corporeal qualities; whence our thoughts are confused. But in heaven, where our **knowledge** will be distinct, we shall drink of the fountain of light, and shall see God “face to face.” For, as God is the ultimate **reason** of all things, it follows that when our knowledge is *a priori*, through the **cause** of causes, we shall certainly see God; inasmuch as our **demonstrations** will then require neither **hypotheses** nor experiments, and we shall be able to give reasons, even to the **primitive truths** themselves. (A VI iv 2452; Ru 162)

In this passage Leibniz links the beatific vision to certain ideals that are fundamental to his philosophy, including a fully distinct knowledge and a fully demonstrated **system**. For Leibniz, a perfect

knowledge of the world is a blessed state comparable to the beatific vision to which humans can aspire but will not achieve, at least in this life. It corresponds, in Leibniz's system, with what would later be seen as the limiting notion of a completed **science**.

**BEAUTY (PULCHRITUDO/BEAUTÉ/SCHÖNHEIT).** Beauty is, for Leibniz, the **order** or **harmony** in something in virtue of which it gives **pleasure**. Sometimes Leibniz seems to endorse a **causal** theory of beauty and so to be adopting a position recognized in the subject later known as “aesthetics,” namely, that beauty is something we perceive in objects that causes us to have feelings of pleasure. But his usual position implies that beauty exists objectively whether we perceive it or not. The beauty of **music**, he claimed, “consists only of the agreement of numbers” (*Principles of Nature and Grace, Founded on Reason*, §17)—an agreement of which we may not be consciously aware. The perception of beauty requires an ability to perceive something as a whole and, specifically in music, requires an ability to hear a series of sounds as a whole. The beauty of the whole can be enhanced by the introduction of dissonant chords that are not beautiful in themselves. The beauty of the visual arts and of natural objects, including persons, consists of “proportions” that please us.

Leibniz thought that the more we study the order of **nature**, the more impressed we are bound to be by its beauty and the greater will be our admiration for the **wisdom** of the **Creator**. In one passage he reports of Galen that, after learning about the functioning of the parts of **animals**, he was so moved as to claim that to explain their operation was in effect “to sing hymns to the honor of the divinity” (GP vii 274; L 479). Beauty in this context is something that it is appreciated by the intellect and is not essentially mediated by the senses. To that extent, it would be inappropriate to say that Leibniz had an aesthetic theory in the strict sense that is implied by the derivation of the word *aesthetics* from the Greek word for **perception**. But the references to beauty in his writings show that it forms an integral and pervasive part of his philosophy: as he put it in a paper on wisdom, “**happiness**, pleasure, **love**, perfection, being, **power**, freedom, order, and beauty are all connected to one another” (GP vii 87; L 426). *See also* TELEOLOGICAL ARGUMENT.

**BEAUVAL, HENRY BASNAGE DE.** *See* BASNAGE DE BEAUVAL, HENRY.

**BEING.** *See* EXISTENCE; SUBSTANCE.

**BELIEVING, USEFULNESS OF.** **Augustine**, in his book *The Utility of Believing* (*De utilitate credendi*), argued that it was right to accept certain beliefs on the basis of authority (specifically of the Church) rather than insist on holding beliefs only on the basis of **reason**. Leibniz was wont to refer to this work in offering a pragmatic response to **skepticism**. **Faith** and its everyday **analogues** (such as relying on the experiences of others) are justified in the long run. Augustine had shown well in his book that, according to Leibniz's gloss, "most of our actions, even in the affairs of common life, rest on faith, and are not on that account less successful in their outcome" (A VI iv 2363).

**BENEVOLENCE (BENEVOLENTIA/BIENVEILLANCE).** *Benevolence*, as Leibniz defines it, is "the habit of love" (E 670; W 568), that is, the habit of delighting in someone else's **happiness**. The habit of delighting in *anyone* else's happiness is **charity**. *See also* JUSTICE; LOVE.

**BERKELEY, GEORGE (1685–1753).** An Irish philosopher and Anglican clergyman, later bishop, who defended a form of **idealism**, dismissing what philosophers thought of as "**matter**" while still insisting on the reality of the objects of our senses. Berkeley's *Principles of Human Knowledge* (1710) came to the attention of Leibniz, who found much to agree with in it but thought it was overstated. In a note at the end of his copy, Leibniz wrote, "There is no need for us to say that matter is nothing. It is sufficient to say that it is a phenomenon like a rainbow. Nor need we say that it is substantial: rather that it is the result of **substances**." (A translation of the whole text of Leibniz's summary response to Berkeley's book is given in AG 307.) How far Leibniz's later views are really different from Berkeley's is a matter that scholars have debated. There are many points of convergence, for instance in their rejection of the absolute view of **space**

and **time**. In one respect, however, Berkeley's idealism is more extreme than Leibniz's, since he holds that the only substances are spirits, which for Leibniz are a special subclass of **monads**.

Berkeley seems not to have known of Leibniz's published statements of his **metaphysics** such as his *New System*. He seems only to have read a few of his scientific articles in the *Acta Eruditorum* such as the *Specimen of Dynamics*. On the basis of these articles, Berkeley was severely critical, particularly in his unsuccessful prize essay in the philosophy of **science**, *De motu* (On Motion), attacking the "**abstraction**" of notions like "**force**" and "impetus." "Even the greatest men," he concluded, "when they give way to abstractions are bound to pursue terms that have no certain significance and are mere shadows of **Scholastic** things" (§8). Leibniz, for his part, claimed that the rejection of abstract ideas was the worst thing about Berkeley's book.

**BERLIN**. The capital of Brandenburg and later of Prussia. **Sophie-Charlotte**, daughter of the electress **Sophie**, Leibniz's **Hanover** patroness, married the elector of Brandenburg and in due course became queen of Prussia. Leibniz was, in effect, her tutor in philosophy as well as an old friend and was a frequent and welcome visitor, especially in the late 1690s and early 1700s. He even had his own apartment in the queen's palace at Lützenburg. He there engaged in debate with **John Toland** at the queen's request and one of his most important papers (*Sense and Matter*) was written as a reply to Toland. Thanks to the intervention of the queen, Leibniz was able to persuade the king to set up the Berlin Society of Sciences in 1700. He wrote its charter and was appointed president.

**BERNOULLI, JAKOB (1654–1705) AND JOHANN (1667–1748)**.

Jakob Bernoulli was a professor of **mathematics** at Basel. On his death in 1705 his position was taken over by his brother Johann, who had been professor of mathematics at Groningen. The Bernoullis had much success in applying Leibniz's differential calculus to problems in **physics**. In 1691, while in **Paris**, Johann taught the calculus to other leading mathematicians of the day, including Guillaume François Antoine de l'Hôpital (1661–1704). In 1698, this time in Leiden, he defended Leibniz's **dynamics** against **Burchardius de Volder** (1643–1709), professor of mathematics and philosophy there.

The **correspondence** between Leibniz and de Volder was conducted through Johann.

Leibniz corresponded with the Bernoullis on the calculus, and many of his innovations on this subject are first found in their letters. Following the death of Jakob, Leibniz continued to write to Johann on all aspects of contemporary mathematics. It was Johann who first informed Leibniz, in 1713, of the contents of the **Royal Society's** *Commercium epistolicum de analysi promota*, which formally judged Leibniz to have plagiarized the calculus from **Isaac Newton**.

In an *éloge* of Jakob Bernoulli, published in the *Nouvelles de la République des Lettres* in 1706, **Bernard Fontenelle** attributed the invention of the calculus to the Bernoulli brothers. A refutation of this by Leibniz was published in the same journal later that year. However, in the refutation Leibniz notes how much the Bernoullis had contributed to the application of the calculus and how they, along with l'Hôpital, had promoted the technique more than anyone. In a letter to Louis Bourguet in 1714, Leibniz described Johann as “a luminary of our century” (GP iii 563). *See also* INFINITESIMAL CALCULUS.

**BEST, PRINCIPLE OF THE.** *See* FITNESS, PRINCIPLE OF.

**BEST OF ALL POSSIBLE WORLDS.** *See* OPTIMISM.

**BIBLE.** *See* SCRIPTURE.

**BINARY SYSTEM.** A system of numbers based on just two digits, 0 and 1. The binary system is fundamental to modern computer science and technology. Leibniz used a binary system in order to show that the whole of **arithmetic** was derivable by definitions from the two fundamental numbers 0 and 1. He conceived of the binary system as “the image of **creation**,” all creatures deriving from **God** and nothingness in an **analogous** way to the way in which 1 and 0 are sufficient to generate the number system. He designed a medal to celebrate this discovery with a motto that translates “One is enough to derive everything from nothing.” The medal also outlines Leibniz’s binary system. *See also* NATURAL THEOLOGY OF THE CHINESE, DISCOURSE ON.

**BIRTH.** *See* GENERATION.

**BODY (CORPUS/CORPS).** Leibniz held that having a body was part of the limitation of all **created** things and that only **God** was a pure spirit. Even **angels**, he claimed, have bodies, though angels' bodies are much more subtle and less limiting than those of humans. Leibniz rejected the **scholastic** view that **souls** could exist in a state where they are **separated** from bodies. He made use of an important distinction between subtle bodies and gross bodies. When animals are said to "die," they suffer the dissolution of their gross bodies but they also contract into subtle (invisible) bodies from which, Leibniz held, they would be later expanded, acquiring new gross bodies. He speculated that the **resurrection** of human bodies would be **analogous**.

In his *Discourse on Metaphysics* and **correspondence** with **Antoine Arnauld**, Leibniz seems to have assumed or have been prepared to assume that what are ordinarily thought of as bodies are **corporeal substances**. But bodies, considered as extended **matter** and apart from souls or **substantial forms**, are not **substances**, according to his view but mere **aggregates**.

**BOEHME, JAKOB (1575–1624).** Boehme was a Lutheran and a native of Silesia, Germany, and was famously a self-educated artisan. His most important publications were *Aurora, oder die Morgenröte in Aufgang* (1612) and *Mysterium magnum* (1623). Absorbing works on the occult, **alchemy**, astrology, and **Kabbalah**, his philosophy forms a part of the German tradition of religious **Neoplatonism**. Paracelsus (1493–1541) and Valentin Weigel (1493–1541) were important influences. His teaching was concerned with providing accounts of the nature of **God** and the origin and nature of the **universe**, which he claimed was a manifestation of the divine. He equated God the Father with Will, and God the Son with Heart. These two **emanated** God the Spirit, whose degeneration gave rise to **matter**. Boehme also believed in the idea of a natural language, that is, one in which the **essences** of things are expressed. Unusually, he thought that each mother tongue was such a language. Boehme's teachings were very influential—the Quakers particularly liked him on account of his anti-intellectualist position and the fact that he was a self-taught laboring man. **Francis Mercury van Helmont**'s ideas on nat-

ural language were influenced by Boehme; and many of Boehme's ideas were later revived by Friedrich Schelling.

Leibniz knew of Boehme's philosophy through his **correspondence** from 1696 to 1700 with André Morell, who was a keen follower of Boehme. In their correspondence Morell wrote at length on Boehme's account of the creative aspects of the godhead and on natural language. But Leibniz had an ambivalent opinion of Boehme, which was typical of his reception of Neoplatonic **mystical** systems. He commented to Morell on Boehme's doctrine of **creation** by citing his own (different) account. Although prepared to accept the idea that all human languages may have had a single common source, he rejected Boehme's *Natur-Sprache*—that the meanings of words *directly* denoted things. Leibniz argued instead that the meanings that words acquired came by a complexity of ways and were not simple correspondences. *See also* ADAMIC LANGUAGE.

#### **BOINEBURG, BARON JOHANN CHRISTIAN VON (1622–1672).**

Chancellor to the archbishop-elect of **Mainz**. Boineburg befriended Leibniz around 1677, probably in Nuremberg. Leibniz then had just been awarded his doctorate in law from the University of **Aldorf**. Boineburg became Leibniz's patron, taking him into his own employ as librarian and legal advisor. He also secured for his young friend an important legal post at the Court of Mainz.

Boineburg was a Catholic of a very ecumenical disposition, who encouraged Leibniz in his *Catholic Demonstrations* project. He also encouraged him to write a defense of the **Trinity** against the **Socinians**. Leibniz traveled to **Paris** with Boineburg as part of a diplomatic mission on behalf of the elector of Mainz. On his untimely death, however, Leibniz was left to his own devices until 1676, when he accepted a position in **Hanover**.

#### **BOSSSES, BARTHOLOMÄUS DES (1668–1728).**

Jesuit teacher of philosophy, **theology**, and **mathematics** in Hildesheim and later in Cologne. Leibniz was visited by Bosses in 1706, when they began a **correspondence**—more than a hundred letters passed between them—that lasted until Leibniz's death. A selection of the correspondence is published in GP ii 287–521 and a complete *en-face* edition with English translation is forthcoming in the Yale University Press series.

Among the subjects discussed between Leibniz and Bosses were the union of the **soul and body** and the possibility of **transubstantiation**. The correspondence is one of the most important sources for Leibniz's later views on **corporeal substances** and, curiously, it is the only context in which he appears to have introduced the apparently key notion of a “substantial chain” (*vinculum substantiale*) that theoretically should unite a collection of **monads** into a composite **substance**.

**BOSSUET, JACQUES-BÉNIGNE (1627–1704)**. Born in Dijon, Bossuet entered the priesthood in 1652 and rose to become the bishop of Mieux in 1681. Because of his influence at Court, he was one of the most important figures of French Catholicism in his time. He had an erratic **correspondence** with Leibniz between 1679 and 1702 about the possibility of a **reunion** of the Lutheran and Catholic churches. Since, however, he regarded all Protestants, Leibniz included, as heretics, this correspondence did not get far. Nonetheless he took some interest in Leibniz's later *Catholic Demonstrations* project and Leibniz sent him some of his works on **dynamics**. Bossuet was, however, of no service to Leibniz. The French version of Leibniz's *Reform of Metaphysics* was sent to Bossuet, partly in the hope that he would secure its publication. Bossuet did nothing with it, however, and this paper came to light only much later when it was published among Bossuet's collected works and translated in WF 31–35.

Bossuet, always a doughty champion of Catholic orthodoxy, became involved in a dispute with the **quietist** archbishop, François Fénelon (1651–1715). Fénelon had argued, in his *Explication des maxims des saints sur la vie intérieure* of 1697, that the pure **love** that was owed to **God** must exclude “every interested motive,” even that the **soul** should be prepared to sacrifice its interest in eternal life. Bossuet attacked this view, and Fénelon found himself banished from Court in France with his *Explication* added to the Index of books prohibited to good Catholics. That did not end the controversy, of course, and it was taken up by other people on each side. Leibniz alluded to the controversy in the preface to his *Mantissa codicis juris gentium* of 1700. He made it clear that he did not think that the soul could be indifferent to its own **happiness** and condemned the “negation of

self” taught by “false **mystics**” (L 424). He nonetheless agreed that true love should be disinterested, not in the sense that it gives us no **pleasure** or satisfaction whatever, but in virtue of our pleasure being derived from the good of someone else (GP iii 425; L 630). *See also* CHURCH UNITY.

**BOYLE, ROBERT (1627–1691)**. Irish aristocrat, **Modern philosopher**, and one of the founders of the modern discipline of chemistry, whose name is immortalized by one of its most fundamental laws. Boyle was one of the founders and leading lights of the **Royal Society**. He was an admirer of **Francis Bacon** and a defender of more rigorous **empirical** methods of inquiry. He was a friend of and an important influence on **John Locke**. Boyle believed that a close study of **nature** would lead people to recognize in its design the work of a good and wise **Creator**. A series of lectures designed to provide a rational defense of **theism** was named after him.

Leibniz shared with Boyle an admiration for Bacon and with both of them a desire for more rigorous methods in empirical **science** as well as for greater cooperation between those engaged in it through scientific institutions. He also sought to reconcile the new mechanistic science of nature with religious belief, agreeing that a proper study of nature would confirm belief in **God**. The two men met when Leibniz visited **London** in 1673, though they did not correspond, probably because of language difficulties.

Leibniz made notes on several of Boyle’s books, including *The Origin of Forms and Qualities*, *The Excellence of Theology*, and *Some Physico-Theological Considerations about the Possibility of the Resurrection* (A VI iii 218–41). Though he always referred to Boyle in respectful terms, Leibniz did not hide his disagreements with him. In religious matters he felt Boyle did not get to the heart of the matter and was himself—for instance, when writing about the possibility of the **resurrection**—more willing to be speculative and to argue **a priori**. In his paper *Nature Itself*, Leibniz argued against Boyle’s view (expressed in a book with that title) that the word *Nature* should be avoided and the term *mechanism* used instead. Though he agreed with a mechanistic methodology for natural science, Leibniz insisted that it was necessary to attribute an “inherent **force**” or “**action**” to created things.

**BRIEF DEMONSTRATION OF A NOTABLE ERROR OF DESCARTES (BREVIS DEMONSTRATIO ERORIS MEMORABILIS CARTESII).** Leibniz's *Brief Demonstration of a Notable Error of Descartes* was published in March 1686 in the *Acta Eruditorum*. In this short but important work, Leibniz attacks the very foundations of **Cartesian physics** by showing up the **paradoxes** inherent in **René Descartes's** claim that the same quantity of **motion** is always conserved. Descartes had erred, according to Leibniz, in believing that motive **force** and quantity of motion were equivalent—because he had failed to distinguish between motion and velocity and to take mass into account when explaining collisions between bodies. Though emphasizing what was wrong with Cartesian physics, and only hinting at what he intended to replace it with, the *Brief Demonstration of a Notable Error of Descartes* was the first public announcement of a Leibnizian physics. This physics, based on a new conception of force, would be fully developed over the next few years in *Dynamics*, a summary of which would be published as the *Specimen of Dynamics* in 1695.

Reactions to the *Brief Demonstration* included those of the Cartesian Abbé Catelan and Denis Papin. The subsequent **correspondence** with these critics resulted in Leibniz improving the formulation of his ideas, a summary of which was added to the work in the form of a supplement. *See also* MOMENTUM.

**BRUNO, GIORDANO (1548–1600).** An Italian monk who supported the Copernican **hypothesis**, attacked **Aristotelianism**, and espoused a broadly **Neoplatonic** philosophy. He was condemned as a heretic and burned at the stake in Rome. Bruno had a **monadology** sufficiently similar to that of Leibniz to give some plausibility to the claim that the Italian had influenced the later philosopher significantly. It seems, however, that Leibniz's familiarity with Bruno's work was quite limited and that any convergence of their philosophies is more probably due to their belonging to a common philosophical tradition. The attention of the young Leibniz was drawn to certain of Bruno's writings in which he took up the art of **combinations** of **Ramon Lull**. Leibniz was much impressed by these writings and may have taken from Bruno the phrase *ars combinatoria*, which he used in the title of a dissertation he wrote in 1666. Later on, Leibniz was rather ashamed of his earlier association with Lullism. But

Bruno, because of his revival of **atomism** and his advocacy of an **infinite universe**, continued to be valued by Leibniz as a precursor of **Modern philosophy**.

**BRUNSWICK, HOUSE OF.** *See* CODE OF THE LAW OF THE PEOPLES (CODEX JURIS GENTIUM DIPLOMATICUS); HANOVER.

**BURNETT, THOMAS (OF KEMNAY) (1656–1729).** A Scottish gentleman from Aberdeenshire. Failing in his claims to a title and land, he took to travel. He supported the **Hanoverian** succession and became a correspondent of the electress **Sophie**. He made friends with Leibniz in 1695 and the exchange of letters between them lasted for nearly 20 years. Burnett was one of Leibniz's most diligent **correspondents** on all matters British, sending him no fewer than 57 letters, offering light on literary, political, and religious affairs as well as keeping his German friend informed about **John Locke** and the controversies aroused by his *Essay Concerning Human Understanding*. Burnett sought to mediate between Leibniz and Locke but failed to set up a correspondence between them. Locke seemed well disposed enough to discuss how to help Leibniz, such as by finding the German philosopher an ecclesiastic sinecure in England. But Leibniz had other ambitions. Much of this correspondence with Burnett has yet to be published, though there is a substantial selection in GP iii 149–329.

Thomas Burnett of Kemnay is sometimes confused with his older and otherwise better known contemporary Thomas Burnet (1635?–1715), who was master of the Charterhouse and author of the *Sacra telluris sacra* (The Sacred Theory of the Earth) of 1681, a work that caught the attention and interest of Leibniz. This other Thomas Burnet (spelled with one t) was one of Locke's philosophical critics.

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**CABALA/CABBALA.** *See* KABBALAH.

**CALCULATING MACHINE.** Leibniz was the inventor of the first calculating machine that could perform all of the basic operations of

**arithmetic.** Blaise Pascal had produced a machine before him that did both addition and subtraction, though it required a number of interventions from the operator. In 1673 Leibniz produced his first model of a machine that would also do multiplication and division and did not require these interventions. He took it with him to **London** that year to show it to members of the **Royal Society** but it was not working properly and his demonstration had a mixed reception. Nonetheless it was partly on the strength of this invention that he was admitted to membership of the society shortly after his return to France. He fulfilled his promise to return to London with a working model in 1676. Leibniz's was an intricate and far from robust machine, however, and the difficulties with it persisted, precluding its commercial development.

Leibniz's career as an inventor—he turned his hand to designing whatever seemed necessary, such as pumps for his employer's mines or a coach in which he could carry on writing—is not necessarily connected to his philosophical work. It is interesting to speculate, however, that the idea he owed to **Thomas Hobbes**—that thought is a kind of computation and which inspired his logical calculus—may also have been a source of inspiration for his calculating machine. See image 2 for a photograph of the only model of Leibniz's machine that survives.

**CALCULUS.** *See* INFINITESIMAL CALCULUS; LOGIC.

**CAROLINE, PRINCESS OF WALES (1683–1737).** Caroline was born at Ansbach, the daughter of the margrave of Brandenburg-Ansbach. In 1705 she married George August, the son of **Georg Ludwig** of **Hanover** and heir to the British throne. When her father-in-law became King George I in 1714, she became the Princess of Wales. Partly because she was intelligent, informed, and personable and partly because the king had divorced his wife, she was prominent in British public life even when she was only Princess of Wales. After she became queen in 1727, it appeared to some that she enjoyed more power than her husband, George II.

Caroline met Leibniz in 1704 when they were both visiting her sister-in-law, **Sophie-Charlotte**, the queen of Prussia, at her Court in **Berlin**. Caroline and George August spent the early years of their

marriage at **Hanover** and Leibniz became her friend and informal tutor in philosophical matters. After they moved to London, she **corresponded** with Leibniz. She hoped to find someone who would translate the *Theodicy* into English and she mediated Leibniz's famous correspondence with **Samuel Clarke**. Though she did what she could to champion Leibniz's cause, she was later persuaded by his English critics. One volume of the works of Leibniz in the edition of Klopp (K XI) is devoted to his correspondence with Caroline.

**CARTESIANS.** Followers of the philosophy and especially the **physics** of **René Descartes**. The most important Cartesians were Jacques Rohault (1620–1672) and Pierre-Sylvain Régis (1632–1707). The Cartesians developed and modified some of Descartes's ideas. Most notably, Descartes had assumed that **mind and body** influenced one another, even though he failed to make **intelligible** how this was possible, given that they were wholly different **substances**. Some Cartesians, such as **Géraud de Cordemoy**, accepted that mind and body could not **interact** and proposed instead that only **God** is a true **cause** and that natural "causes" are no more than **occasions** for God, in accordance with his laws, to bring about their usual effects. This view was also taken by **Nicolas Malebranche** who, although too independent a philosopher to be classed as a Cartesian, was a great admirer of Descartes.

Leibniz was attracted to some of Descartes's ideas as a young man, when he encountered the writings of Cartesians like Johann Clauberg (1622–1665), who presented Descartes's thought in a relatively easy and accessible form. Leibniz continued to hold that philosophy should explain the world through intelligible notions such as those used in geometry. Like the Cartesians, he was opposed to **Isaac Newton's** views on **gravity**, which he also thought revived **occult qualities**. Nonetheless he rejected Cartesian laws of **motion**, maintaining that physics had to postulate **forces** in order to explain the phenomena. These forces could not be made intelligible in Cartesian terms but were, according to Leibniz, made intelligible by **metaphysics**.

**CATHOLIC DEMONSTRATIONS.** One of the large writing projects in which Leibniz hoped to use his philosophy to promote reconciliation between the churches. The project dates from Leibniz's time at

the Catholic Court of **Mainz** in the period 1668–1672, during which he drew up an outline for the book. Changes in Leibniz’s circumstances in the early 1670s overtook the execution of the project as Leibniz originally envisaged it. It was, however, revived in another form, with the encouragement of the Catholic convert Duke **Johann Friedrich**, after he had taken up his position in **Hanover**, and the project continued to interest Leibniz for much of what remained of the 17th century. The *Catholic Demonstrations* exists only as a conspectus with chapter headings, though various fragments are thought to have belonged to it. The work was to have begun with a philosophical prolegomenon, including **logic**, **metaphysics**, **physics**, and practical philosophy. Later parts were to include **demonstrations** of the **existence of God**, of the **immortality of the soul**, and of the authority of **Scripture** and that of the Church, as well as a proof of the possibility of the Christian **mysteries**. There are fragments from Leibniz’s Mainz period, such as the *Confession of Nature against the Atheists*, that may have been drafts of some of these later parts.

Some of Leibniz’s later writings may be considered as a continuation of this project. The *Discourse on Metaphysics* of 1686, for instance, corresponds to a large extent to the proposed philosophical prolegomenon. That this was no accident is shown by Leibniz’s circumspection in sending its headings diplomatically through an intermediary in order to sound out the reaction of the great Catholic philosopher and theologian **Antoine Arnauld**. His hope was that Arnauld would welcome the *Discourse* or at least acknowledge that it would be allowable for a Catholic to entertain its claims. The outcome suggests that Leibniz was unrealistic in his hope that a philosopher had a special role to play in reconciling the divided churches. Certainly the reaction of Arnauld suggested that his own philosophy, which was so easily misunderstood, was too idiosyncratic to be of use in this context. *See also* CHURCH UNITY.

**CAUSE (CAUSA/CAUSE).** The “cause” of something, according to Leibniz, is the “real reason” for it (GP vii 289). According to this view, causes contain their effects in the sense that anyone who knows the cause can deduce the effect from it. Leibniz distinguished various kinds of causes, usually in conformity with the philosophical tradition. Thus he distinguished, following the **Aristotelian** tradition, be-

tween “**final causes**” and “efficient causes,” the former being purposive and the latter not. The **Cartesians** were opposed to the use of final causes in the natural **sciences**, but on this matter Leibniz disagreed with them.

Another distinction that was important for Leibniz was that between the “first” or “universal” cause—**God**—and secondary causes. The need for a universal cause of or reason for the world is the basis on which **cosmological arguments** for the **existence** of God were advanced. But, while Leibniz made use of such arguments, he thought it important to look for secondary causes and not be content with God-centered (*deus ex machina*) explanations of phenomena.

A further distinction Leibniz accepts is between causes (proper) and what other 17th-century philosophers called **occasions**. “What we call ‘causes’ are, in metaphysical strictness, nothing more than concomitant requisites” (A VI iv 1647: cf. P 90). Leibniz accepted the view of causation according to which there has to be a necessary connection between a cause and its effect. But he rejected the conclusion of **Nicolas Malebranche** that, since it is only in the case where God is the cause that there is a **contradiction** in supposing that the cause occurs and not its effect, what we ordinarily call “causes” are never more than “occasions” for God to will their effects to occur. He agreed with Malebranche that **physics** is concerned only with occasional causes, but he rejected the view that only God is capable of **action**. Any true **substance**, according to Leibniz, must be capable of action. Since, by Leibniz’s account, everything that happens to any individual **created** substance is derivable from its **complete concept**, it can be said to be caused by its nature.

He distinguished, however, between those events over which we have no control and those where we exercise **free will**: in the first kind of case, what happens is necessitated, whereas in the second it is not. There is always a **sufficient reason** for what we do, according to Leibniz, when we freely chose to do something, but this **inclines without necessitating**.

Leibniz’s denial of any strict causal **interaction** between substances raises the question as to whether there is any real distinction that can be marked in his **metaphysics** between what is ordinarily called a “cause” and its effect. In his *Discourse on Metaphysics*, Leibniz addressed this question, claiming that the action of one

substance on another consists solely in the fact that the substance that is the cause has “more clear and distinct **perceptions**” or expresses the phenomena more perfectly than the effect (§15). Leibniz invoked this account to explain the relationship between the “dominant **monad**” that unites the monads that make up a single **animal** with all the monads that constitute the **body** of the animal and would otherwise be a mere **aggregate**. Sometimes he writes as if this is all there is to the union of **soul and body**, although at other times he writes as if this were a **mystery** that philosophy may not be able to explain. *See also* ANALYSIS; TOURNEMINE, RÉNE-JOSEPH DE; *VINCULUM SUBSTANTIALE*.

**CERTAINTY (CERTITUDO/CERTITUDE)**. Leibniz made use of a distinction between two main kinds of certainty: “practical” or “moral” certainty, such as may be provided by lengthy experience; and “absolute” or “**metaphysical**” certainty, where it is possible to **demonstrate** that a proposition must be true and that it would involve a **contradiction** to deny it. Leibniz conceded to **skepticism** that it cannot be demonstrated with absolute certainty that material **bodies** exist. It is nonetheless a matter of moral certainty. Also, unlike **René Descartes**, he thought the **argument for the existence of God** derived from **Anselm** needed an additional premise to be made rigorous and its conclusion absolutely certain. Though he made several attempts to remedy this defect, he later expressed the view that its conclusion was no more than morally certain (*New Essays*, A VI vi 68). Corresponding to the two kinds of certainty there are, for Leibniz, two kinds of **knowledge**. *See also* EXTERNAL WORLD; FOUCHER, SIMON.

**CHAIN OF BEING, GREAT**. An ancient doctrine that was revived during the **Renaissance** and was widely accepted in the 17th century and later. The doctrine, in outline, is that the totality of beings form a hierarchy, with the most spiritual at the top and the most base at the bottom. At the apex of the hierarchy is **God** or a similar being. **Angels** are usually placed next and humans some way further down. Belief in a great chain of being is also a natural consequence of accepting the principle of **plenitude**. Not only should we expect there to be, if it is true, a **plurality of worlds** comparable to the Earth but also

other worlds inhabited by creatures who, though still inferior to angels, are superior to humans. This view was embraced by **Giordano Bruno** and, by the 17th century, creatures in some respects **analogous** to humans had become the stuff of science fiction.

“The Great Chain of Being” has become familiar as the title of a book by Arthur O. Lovejoy. Lovejoy’s book is a history of the idea that goes back to **Plato** and includes attention to Leibniz’s use of it. Leibniz was familiar with the metaphor of a chain of being and used it himself in one letter (BC II 558; W 187) where he infers from his law of **continuity** that there are creatures that come between plants and **animals**. In his *New Essays*, Leibniz goes further and speculates that “in some other world there may be species intermediate between man and beast” and again “in all probability there are rational animals somewhere that are superior to ourselves” (A VI vi 473). **Nature** has seen fit not to challenge human supremacy on Earth, Leibniz explains, and so these troubling creatures have been set at a distance. But, given his acceptance of a plurality of worlds, Leibniz is confident that they would be found somewhere in the scheme of things.

Despite this admission of the possibility of creatures intermediate between humans and animals, Leibniz usually wants to draw a sharp line between rational beings, which have the divine spark in them and qualify for membership of the **City of God**, and those that lack **reason**. To that extent, he is committed to qualify his acceptance of a thoroughgoing chain of being. Though such gaps or breaks in the chain—what Leibniz terms a **vacuum among forms**—might seem to be a sign of a lack of **perfection** in the created **order**, Leibniz has arguments available to him comparable to those that explain why some **evil** might be necessary even in the best of all possible worlds.

**CHARACTERISTIC, GENERAL** (*CHARACTERISTICA GENERALIS*). See CHARACTERISTIC, UNIVERSAL.

**CHARACTERISTIC, UNIVERSAL** (*CHARACTERISTICA UNIVERSALIS*). Leibniz’s interest in a universal language of thought goes back to his student days and to his youthful *Dissertation on the Art of Combinations*. He was not alone in his interest in devising a universal language—others, in whose projects he took a keen

interest, included Athanasius Kirscher (1602–1680), George Dalgarno (1626–1687), and one of the founders of the London **Royal Society**, John Wilkins (1614–1672). But Leibniz was unique in wishing to devise a **logical** language so that his project was closely allied to one for a universal **science**. The language would consist of terms that referred to simples—his **alphabet of human thoughts**—and rules governing the combination of these terms. The result would be a notation that would create a “rational philosophy” with a clarity comparable to **arithmetic** and a calculus for determining the **truths** of propositions in all areas, including **ethics** and **metaphysics** (A VI iv 267; AG 8).

Leibniz was moved to make extravagant claims for his universal language—even that missionaries might use it in teaching the true **natural religion**, with the result that “apostasy” (from the Christian religion) will be feared no more than loss of belief in arithmetic and geometry (A VI iv 269; AG 9). But, in spite of his efforts, Leibniz failed to arouse much interest in his universal characteristic—which some of those best placed to recognize its potential dismissed as a fantasy. It was in no way finalized, but Leibniz’s notes, which were ignored for more than two centuries, show how far he had gone beyond traditional syllogistic and how far he anticipated the development of modern symbolic logic. *See also* ADAMIC LANGUAGE.

**CHARITY (CARITAS).** Leibniz defines *charity* as “universal **benevolence**” (E 670; W 567). Benevolence being the habit of **loving** someone, that is, delighting in their **happiness**, charity is delighting in *anyone’s* happiness. Charity is a pivotal notion in Leibniz’s **ethics**, since the key virtue of **justice** is defined by him as “the charity of the wise.” *See also* WISDOM.

**CHINA.** Leibniz, like many other Europeans of his day, took a great deal of interest in China and Chinese civilization. He thought indeed that Europeans had much to learn from the Chinese, particularly about practical philosophy (**ethics** and politics). In view of the sophisticated nature of Chinese civilization, some missionaries thought that an “accommodation” should be sought between Chinese thought and Christian ideas. This was, however, a matter of some controversy. Others—and they prevailed within the Catholic Church—

thought that the Chinese should be treated as pagans and required to abandon their old ways of thinking when they converted to Christianity. Leibniz was a supporter of accommodation and, in 1716, he wrote a substantial *Discourse on the Natural Theology of the Chinese* in which he sought to show that the ancient Chinese did have notions like that of the Christian **God** and of **immortality**. He had earlier edited a collection of essays by Jesuit missionaries on recent news from China (*Novissima Sinica*).

**CHURCH UNITY.** The Germany in which Leibniz grew up was divided into numerous states, some Catholic and others different kinds of Protestant, depending on the religion of the ruler. Religious differences helped to fuel and perpetuate a disastrous war—the Thirty Years War (1618–1638)—that ended when Leibniz was a child but which put the religious question high on the agenda of German statesmen, including his early patrons. Himself a Lutheran by birth, Leibniz was eager to promote reconciliation between his denomination and others, particularly the Catholic Church, as well as with the Calvinists. Both during his association with the Catholic Court in **Mainz** (1668–1672) and in the first two decades of his time at the Court of **Hanover**, he was encouraged to play a leading role in the attempt to bring the Catholic and Lutheran churches together.

Leibniz believed that philosophy could be of use in promoting closer relations between the churches because it appealed to **reason** alone and therefore to what the different parties ought to be able to agree about. In his *Catholic Demonstrations* and his *Examination of the Christian Religion*, he used his philosophy to suggest how the Christian religion was founded on reason and how, from the Lutheran side, it was possible to give a “good sense” to some of the doctrines and practices of Catholics that they had previously rejected. Leibniz engaged in a number of **correspondences**, including those with **Antoine Arnauld**, **Jacques-Bénigne Bossuet**, and Paul Pelisson-Fontanier (1624–1693), with a view to promoting Church unity. This was a high priority for him for more than 30 years from early in his time in Mainz. It was only once it became clear that the Hanovers would need to stress their Protestant credentials to maintain a claim on the British throne that he ceased to be active in pursuing the prospect of a reunion with the Catholic Church.

**CITY OF GOD (CIVITAS DEI/CITÉ DE DIEU).** *The City of God* was a book by **Augustine** in which he contrasted the Church (*civitas dei*) with the State (*civitas terrene*). Leibniz took over the phrase but used it differently to refer to the perfect community of all the spirits in the **universe**. He refers to it as “this truly universal monarchy”—also, and less appropriately, as the “republic” of minds—and describes it as “a moral world within the natural world” (*Monadology*, §86). In the City of God, the virtuous will be rewarded and the wicked **punished**. Leibniz usually avoided speculation about who the members of his *civitas dei* might be in addition to **God**, the **angels**, and humans, past and present. But in theory it should include all the rational beings in the universe. *See also* PLURALITY OF WORLDS.

**CLARKE, SAMUEL (1675–1729).** English divine, philosophical theologian, and follower of **Isaac Newton**. His Boyle Lectures established Clarke as a leading apologist for Christian orthodoxy. It is likely that Newton was a close observer of, if not an indirect participant in, the philosophical controversy in which Clarke engaged as his champion against Leibniz. Five letters were written on each side before the **correspondence** was terminated by Leibniz’s death in 1716. They were published in London in the following year.

Leibniz set the polemical tone of the correspondence by claiming, in the opening letter to Princess **Caroline**, that **natural religion** was in a state of decay in England. He blamed what he saw as a tendency to **materialism** on the influence of **John Locke** and even more on the Newtonians. Locke was criticized for suggesting that the human **soul** might be material and therefore naturally perishable. Clarke distanced himself from Locke at this point but complained that the materialists refused to learn from Locke where he was right and only paid attention to his “errors.” In the case of Newton, however, whom Leibniz accused of virtually making **God** himself a corporeal being by claiming that **space** was God’s *sensorium*, Clarke rebutted the charge entirely. God, *pace* Leibniz’s misinterpretation of Newton, had no need of an organ by which to perceive the world nor indeed has he need of any medium at all. Newton’s **mathematical** principles of philosophy were, on the contrary, quite opposite to those of “the materialists.”

Leibniz conceded that the “Christian mathematicians” were not pure materialists—since they accepted immaterial **substances**—but he persisted with his charge, now fixing on the Newtonian commitment to absolute space, only partly filled with **matter**, and therefore to the existence of a **vacuum**. Here, as elsewhere in the correspondence, Leibniz makes much of his principle of **sufficient reason**. Clarke accepted this principle, but for him it means something quite different since “this sufficient reason is oft-times no other than the mere will of God” (Second Reply, §1, GP vii 359). For Leibniz, on the other hand, there is no such thing as “the mere will of God,” since God’s will is itself determined by the principle of **perfection**. Accordingly he accused Clarke of granting the principle in name only while denying it in reality.

The intellectual distance between the participants was marked also in their discussion of Newtonian **gravity**. Leibniz was adamant that gravity needed to be made **intelligible**, whereas Clarke was content with regularities that could be described mathematically. Leibniz charged, and Clarke denied, that Newton’s account would involve God in “perpetual **miracles**.” But the debate between them here was at cross-purposes, since each was using the term *miracle* in a different sense. By Clarke’s account, a “perpetual miracle” would be a **contradiction** in terms, since miracles are breaches of regularity. For Leibniz, on the other hand, a miracle is something that cannot be explained in natural terms.

Despite the amount of arguing at cross-purposes, the disputants brought out some of the issues between the fundamentally different views of space and **time** with which Newton and Leibniz are each particularly associated. Clarke defended a distinctive variant on the Newtonian theory, namely, that space and time are **attributes** of God. He also produced some of the most trenchant criticisms of the relational theory of space and time with which Leibniz was confronted.

**CLEAR AND DISTINCT IDEAS (*IDEAE CLARAE ET DISTINCTAE/IDÉES CLAIRES ET DISTINCTES*).** René Descartes made it a cardinal **principle** of his philosophy that those **ideas** we have that are “clear” and “distinct” are true. It is because it satisfies this criterion that he thought he could take *Cogito, ergo sum*

(“I think, therefore I am”) as an indubitable **truth** and a foundation on which the edifice of **knowledge** could safely be rebuilt. Many of Descartes’s critics, however, complained that his criteria of clarity and distinctness were themselves far from clear. Leibniz agreed with them. In his *Meditations on Knowledge, Truth, and Ideas*, Leibniz offered his own account of different kinds of ideas. It is apparent, however, that Leibniz’s distinctions belong to a different project from that of Descartes. He suggests that we have a *clear* sense of something when we are able to recognize it and a *distinct* sense of it when we can enumerate the marks by which it can be recognized. But clear and distinct ideas are low down in Leibniz’s hierarchy—at the top end is *adequate* knowledge, which humans have perhaps about numbers but little else. Descartes’s criterion is of little use, in his opinion, and it would be much better to rely on the rules of common **logic**.

**CODE OF THE LAW OF THE PEOPLES (CODEX JURIS GEN-  
TIUM DIPLOMATICUS)**. Published in 1693 this “diplomatic code” of international law was the first fruit of Leibniz’s researches into the history of the House of Brunswick. However, like the *Protogaea*, it is only prefatory to that particular project. It is a collection of political and historical documents—declarations of war, peace treaties, marriage contracts between sovereigns—spanning the 12th to 15th centuries, hitherto unpublished for the most part. The preface to the work is of most interest philosophically. Here Leibniz sets out the methodology by which he thinks history ought to be carried out: by public history “saying nothing false” and private history “omitting nothing true” (R 168) and determining whether the source materials are both accurate and reliable. Only in this way can we hope to understand the currents of history and the causes of events, and so go on to establish a “law of **nature** and of nations” that would provide an enduring peace, rather than that ephemeral peace of the usual political armistices. Leibniz expounds a theory of **natural law** for governing the relations between and within states that is based on Christian doctrine.

In examining the currents of history Leibniz asserts that public acts and events are but the manifest phenomena that result from an **infinity** of hidden yet powerful **forces**. This is the realm of those **appetitions** and **perceptions** of which we can never be consciously sensible and into which the final ends of history disappear.

In 1700 Leibniz published a supplement to this work entitled *Mantissa codicis juris gentium diplomaticus*.

**COGITO.** In his *Meditations on the First Philosophy* (1641), **René Descartes** adopted as a method of inquiry the practice of doubting everything that could possibly be doubted. The point of doing this was to find out those **truths** that could *not* be doubted and which could accordingly serve as firm foundations on which to build his philosophical **system**. Descartes found that the existence of material objects and an **external world** could be doubted. But, as he doubted, he could not doubt that he himself existed as a thinking thing: *Cogito, ergo sum* (“I think, therefore I am”). This proposition, sometimes referred to by subsequent philosophers simply as “the *Cogito*” was taken by Descartes as a paradigm of **certainty**.

Later philosophers have questioned whether Descartes was entitled to infer that he was a *res cogitans* (a thinking thing) and suggested that all that followed was that there was a doubting going on. Leibniz, however, thought that the **principle** was a sound one and that the *Cogito* should be included among what he called the **primary truths** of experience. He claimed, however, that it was neither original nor unique: it was not original with Descartes, since it was to be found in **Augustine**, and it was not unique, since there were other first truths of experience such as that various things are thought by me. Leibniz was, nonetheless, sympathetic to this **Platonic** aspect of Descartes’s thought, as is clear from this remark:

What the ancient Platonists have said is . . . quite true . . . that the existence of intelligible things, particularly of the I who think or am called a mind or **soul**, is more certain beyond comparison than is the existence of sensible things. (GP vi 502: cf. L 549)

*See also* CLEAR AND DISTINCT IDEAS.

**COMBINATIONS, ART OF (ARS COMBINATORIA).** The art of combining simple terms so as to produce complex ones was the subject of a dissertation Leibniz wrote while he was a postgraduate student at **Leipzig** and hoping to become a recognized teacher in philosophy—his *De arte combinatoria* of 1666. Leibniz expanded the

work for publication, including theses for disputation—among them the claim that perfect **demonstrations** are available in all disciplines. Leibniz’s dissertation was influenced by a tradition deriving from **Ramon Lull** and mediated to Leibniz by **Giordano Bruno** and the **Herborn School**. *See also* ALPHABET OF HUMAN THOUGHTS; CHARACTERISTIC, GENERAL/UNIVERSAL; DISCOVERY, ART OF; SYNTHESIS.

**COMMUNICATION OF SUBSTANCES.** The full title of Leibniz’s *New System* of 1695 is *New System of the Nature and Communication of Substances*. Leibniz argued in the first part of this work that it was in the nature of a **substance** to be indivisible, a true **unity**. It followed from this, he seems to have thought, that it is impossible for a substance to be acted on by any other created substance. He thus arrived in his own way at a problem that confronted the **Cartesians** about the relationship of **mind and body**: that because of the nature of substances, it was impossible for them to **interact** or, in Leibniz’s terminology, to “communicate” with one another. In the second part of his *New System*, Leibniz rejects the solution offered by the **occasionalists** to this problem and offers his own view, that **God** created every substance in such a way that everything that happened to it did so “with perfect **spontaneity**” but in complete “conformity” with what was happening to other substances. This “conformity” he later refers to as a **preestablished harmony**.

**COMPLETE BEING (*ÊTRE COMPLET*).** *See* COMPLETE CONCEPT.

**COMPLETE CONCEPT (*NOTION COMPLÈTE*).** Leibniz thought that **abstract** concepts were “incomplete” in that they highlighted only selected aspects of objects. The concept of a sphere in general does not include many features (e.g., color) that are to be found in particular spheres. However, according to Leibniz, each individual **substance** or “complete being” has a complete concept that includes everything that is true of it. Thus the two notions are connected with Leibniz’s important *in esse* **principle** and thus suggest a connection between his **logic** and his **metaphysics**.

**COMPOSSIBILITY.** *See* POSSIBLE WORLDS.

**CONATUS.** *Conatus* (effort, endeavor, inclination, impulse) is one of a number of expressions, along with *nisus*, first **entelechy**, primitive **force**, active force, and **appetition**, that refer to the **principle** of change in things. This use of *conatus* is opposed to that of **Benedict de Spinoza**, whose “*conatus se preservandi*” expresses the principle that things seek to maintain their states. According to Leibniz, the **metaphysical** explanation of **nature** involves appetite in **monads**, which is the effort or *conatus* that is the **final cause** of successive **perceptions** in the monad. This same *conatus* is expressed in **physics** as the efficient **cause** that brings about new configurations of **matter**.

**CONCOMITANCE, HYPOTHESIS OF.** *See* PREESTABLISHED HARMONY.

**CONCURRENCE OF GOD (CONCURSUS DEI/CONCOURS DE DIEU).** A phrase from **scholastic** theology intended to denote the way in which **God**, by virtue of his omnipotence, must be supposed to allow and, in a sense, cooperate with whatever happens in the world. It is sometimes translated—for instance, in the Huggard translation of the *Theodicy*—as “the cooperation of God” but that rather implies that, if God is not the **cause** of **evil**, he was at least an accessory before the fact, which is not what theorists of the *concurus dei* had in mind. Scholastic theories of the divine concurrence, on the contrary, were intended to explain how—even though nothing happens unless God allows it—God is not generally the cause of the evil he allows and is not to blame in any way for the harm people do. Leibniz’s theory is that God concurs both by establishing laws of **nature** in accordance with which things can happen naturally and by the greater good he is able to draw even from the evil that does occur. *See also* CONFESSION OF A PHILOSOPHER.

**CONFESSION OF A PHILOSOPHER (CONFESSIO PHILOSOPHI).** A dialogue between a theologian and a philosopher written by Leibniz around 1672–1673, although it remained unpublished until Yvon Beval’s edition of 1961. The *Confessio philosophi* is concerned

with the implications of the **principle** he later referred to as the principle of **sufficient reason**. In particular it addresses whether it follows that, if everything is to be explained ultimately in terms of the nature of **God**, God is the **cause** of sin. He argues that while God must *permit* sin (or else it would not exist), it does not follow that God *wills* it. The principle of sufficient reason seems also to exclude human **free will**. Leibniz argues that it would only do so if all the causes of human actions were external. But free actions are in **Aristotle's** sense "**spontaneous**," that is, arising from within the agent and not from outside. And such actions, where done for a reason, are free. The questions of the *Confessio philosophi* are addressed also in Leibniz's much later *Theodicy*. See also CONCURRENCE OF GOD.

**CONFESSION OF NATURE AGAINST THE ATHEISTS (CONFESSIO NATURAE CONTRA ATHEISTAS)**. An essay written by Leibniz in 1668 that he probably intended to be part of his ecumenical *Catholic Demonstrations* project. The title is apt for the first part of the essay, in which Leibniz sought to refute **atheism** by arguing that **atoms** cannot be ultimate entities in the **universe** (as the atheist is assumed to suppose) since an incorporeal principle is needed to explain their indivisibility and cohesion. (This "incorporeal principle" he identifies with **God**.) The second part of the essay is a complex **demonstration** of the **immortality** of the **soul** based on assumptions some of which he later abandoned. The *Confessio naturae* was circulated privately by Leibniz's then patron, **Johann von Boineburg**, but, contrary to Leibniz's intention if not his wishes, someone undertook to have it published anonymously in Augsburg in 1669 with the title by which it is now known.

**CONSCIOUSNESS**. See APPERCEPTION; UNCONSCIOUSNESS.

**CONSPIRE, ALL THINGS**. Leibniz was fond of quoting a dictum of the ancient Greek founder of medicine, Hippocrates: "all things conspire" or "all things breathe together." The dictum was originally applied to the human **body**, but Leibniz applied it to the whole world. The point, as Leibniz understood it, is that nothing happens in one part without having an effect on all the other parts. He con-

nects it with his view in **physics** that **nature** is a **plenum** and hence that “every movement has some effect on distant bodies in proportion to their distance” (*Monadology*, §61). It is also connected with his view in **metaphysics** that every **monad** is an **expression** of the entire **universe**, and therefore everything in the universe expresses everything else, albeit from a unique point of view. *See also* HARMONY.

**CONTINGENTS, FUTURE.** *See* FUTURE CONTINGENTS.

**CONTINGENT TRUTHS** (*VERITATES CONTINGENTIAE/VERITÉS CONTINGENTES*). Contingent **truths** are ones that happen to be true and are not **necessary truths**, that is, truths that it would involve no **contradiction** to deny. They are true of this world but not of all **possible worlds**. Such truths are called “contingent” because they depend on the **will** of **God**, as Leibniz supposed, contrary to **René Descartes** and others, that necessary truths did not—hence he also referred to these latter truths as **eternal truths**. *See also* FUTURE CONTINGENTS.

**CONTINUITY, LAW OF** (*LEX CONTINUITATIS/LOI DE LA CONTINUITÉ*). The law—or, as he sometimes calls it, the **principle**—of continuity was regarded by Leibniz as one of his “most important and best verified maxims.” He gave several statements of it of varying degrees of technicality. The simplest version is that **nature** does not contain gaps or leaps. Leibniz’s amplified this account:

The passage from the small to the great and back again always takes place through that which is intermediate, as much in degrees as in parts, and . . . a **motion** never arises immediately from rest, nor is reduced to it except through a smaller motion, just as we never manage to cross over any given line without first crossing over a shorter line. (*New Essays*, preface, A VI vi 56)

Leibniz first proposed his law of continuity in a letter of 1687 he wrote for the *Nouvelles de la République des Lettres* in which he claimed that it showed that **René Descartes**’s laws of motion were incorrect, since they allowed that a body might receive in a moment

a motion contrary to its previous one. But he came to think of it as having wide-ranging application, both critical and constructive. He also used it negatively in denying the possibility of **transmigration** of souls.

Constructively, however, he used it to support the view that “all the **orders** of natural beings form but a single chain, in which the various classes, like so many rings, are so closely linked to one another that it is impossible for the senses or the imagination to determine precisely the point at which one ends and the next begins” (BC II 558; W 187). Leibniz infers from his law of continuity that there must be “plant-animals” or “zoophytes”—creatures that would pass for either plants or **animals**—even though none had yet been observed. *See also* CHAIN OF BEING, GREAT; VACUUM AMONG FORMS.

**CONTINUUM** (*CONTINUUM/CONTINU*). A continuum is anything that is extended in **space** or **time** but is divisible into parts. Leibniz was impressed by a book by the **scholastic** philosopher Libert Fromond (1587–1653) called *The Labyrinth of the Continuum*. The “labyrinth” referred to the difficulty of finding a way out of the problem as to how any continuum could be real if its parts were themselves continua and so further divisible into continua, and so on, apparently to **infinity**. Leibniz inferred from this that space and time are not real things but only **relations**. He also used the infinite divisibility of continua as an objection to **René Descartes**’s claim that the **essence** of **matter** consists in **extension**. Matter, according to the **Cartesian** view, would be insubstantial and unreal. Leibniz’s solution was to insist that every material substance had what he variously called a **soul** or **entelechy** or **substantial form**.

**CONTRADICTION, PRINCIPLE OF** (*PRINCIPIUM CONTRADICTIONIS/PRINCIPE DE CONTRADICTION*). The principle that any proposition must be true if it would involve a contradiction to deny it. This was one of Leibniz’s fundamental **principles** and one he invariably includes among his **primary truths**—indeed, for him it is the highest principle of **necessary** or **eternal truths**, the one on which they all depend. He defended the principle by pointing out that, unless it is accepted, nothing can be *said*. The principle, he pointed out to his correspondent **Simon Foucher**, is one that even the

**skeptic** must suppose in writing or reasoning “or else at any moment you could defend quite the opposite of what you say” (GP i 382; MB 131). To say one thing is, at the same time, to deny its contradictory. And so to contradict oneself is to say something and then cancel what has just been said.

Leibniz thought that, by the use of definitions, it was possible to **demonstrate** necessary truths by reducing them to statements of **identity**. Thus, for instance, the truth of  $2 + 2 = 4$  can be shown by defining “2” as “1 + 1” and “4” as “1 + 1 + 1 + 1” and reducing “ $2 + 2 = 4$ ” to “ $1 + 1 + 1 + 1 = 1 + 1 + 1 + 1$ .” The principle of identity and the principle of contradiction, which are logically equivalent, are sometimes presented by Leibniz as the same principle.

**CONWAY, ANNE (1631–1679)**. An English metaphysician, born Anne Finch, later Viscountess Conway. She was a pupil of **Henry More** and was indebted to him for her critical but well-informed views of **René Descartes’s** philosophy. Partly through the influence of **Francis Mercury van Helmont**, who was her physician in the 1670s, she became interested in the writings of the Lurianic **Kabbalah**. These were at the time being translated into Latin by **Knorr von Rosenroth**. Anne Conway was the author of a posthumously published book entitled *The Principles of the Most Ancient and Modern Philosophy*, an ambitious account of the **metaphysics** of mind and **matter** and of **God** and the **Creation**, critical of the philosophies of Descartes, **Benedict de Spinoza**, and **Thomas Hobbes** and drawing on “the ancient philosophy of the Hebrews.” Helmont had this work translated into Latin and published in 1690, adding references to Rosenroth’s *Kabbala denudata*. Leibniz knew this edition and thought well of its author. Although he criticized her **vitalism**, he acknowledged that his own philosophy had an affinity with hers. His remark that his own philosophy “approached” that of Conway has encouraged some scholars to suggest that affinities between them reflect the influence of her work on Leibniz’s **monadology**.

**COOPERATION OF GOD.** *See* CONCURRENCE OF GOD.

**CORDEMOY, GÉRARD DE (1626–1684)**. **Cartesian** philosopher and author of *Le discernement du corps et de l’âme* (1666) in which

he defended a strict **dualism**. Cordemoy departed from **René Descartes**, however, in embracing a form of **atomism**. Leibniz thought that Cordemoy was right at this point to sense a deficiency in the Cartesian account of **matter**, namely, that it lacked a principle of substantial **unity**. Cordemoy was wrong, however, to look for this principle in extended matter, according to Leibniz, since material **atoms** are in principle further divisible.

**CORPOREAL PHILOSOPHY.** *See* ATOMISTS.

**CORPOREAL SUBSTANCES** (*SUBSTANTIA CORPOREA*).

**Monads** collect together as **organisms** and nonorganic **aggregations**. An *organic aggregate* is one whose constituent monads act as one thing and is what Leibniz calls a corporeal or composite **substance**. “Composite substances are those which constitute a per se **unity**, composed of a **soul** and an organic **body**, which is a machine of nature that results from monads” (AG 200; GP ii 439). Such a substance is to be contrasted with aggregates that lack organic unity. Aggregates that are comprised of corporeal substances—such as a flock of sheep—still lack an organic unity if they lack a common soul.

Each corporeal substance comprises a soul—a single monad—and a body, which is a collection of monads. Because of the **infinite divisibility** of the **continuum**, this collection, like all spatially **extended** things, consists of an **infinity** of monads. Each **perception** of a soul monad is a single representation of the multiple weaker perceptions of the monads of its body. Insofar as this composite of monads is united by the single being of its soul monad, Leibniz refers to it as a *substance*. “Each distinct simple substance or monad, which makes up the center of a composite substance (an **animal**, for example) and is the **principle** of its unity, is surrounded by a *mass* composed of an infinity of other monads, which constitute the *body belonging to* this central monad, through whose properties the monad represents the things outside it, in the same way that a center does” (*Principles of Nature and Grace, Founded on Reason*, §3). But this term *corporeal substance* does not mean that body, considered on its own, is a substance. The body, the **material** aspect, of a corporeal substance, as a *collection*, cannot be a substance.

Leibniz argues that since every substance must have some (spatially extended) properties, so every soul must have a (spatially extended) body. He writes that “every finite soul is embodied, even the **angels** are no exception” (GP vii 327; W 65). The soul, being a monad, endures—since that which is without parts cannot change in any way—but the body, being a collection, having parts, *can* change. In fact, Leibniz writes that “all bodies are in perpetual **flux**, like rivers, and parts enter into them and depart from them continuously” (*Monadology*, §71).

Since every monad must have a body, those monads that are collected together into the body of a corporeal substance are, at the same time and individually, the souls of smaller corporeal substances. Further, the monads in the bodies of these smaller corporeal substances are themselves also the souls of yet smaller corporeal substances. Because of the infinite divisibility of the continuum, this process is literally endless. “There is an infinite number of creatures in the smallest particle of matter, on account of the actual division of the *continuum* to infinity” (*Theodicy*, §195).

The perception and **appetition** of the soul of a corporeal substance is a unified representation of the “*petites*” perceptions and appetitions of the monads that compose the body of that corporeal substance. But this representation happens not by extrinsic **influence** between monads. According to Leibniz, the perceptions that all monads have—those of the soul monads and the monads of the body—flow from the monad substance itself, for they are the predicates that flow from the **complete concept** of the individual monad subjects, as comprehended by the divine mind. That the soul represents the body, that the body obeys the **will** of the soul—and that the two appear to **commun-icate**—is the result of **God** comprehending the complete concepts of all the monads of the universe simultaneously and harmoniously. *See also* IDEALISM.

**CORPUSCULARIAN PHILOSOPHY.** *See* ATOMISTS.

**CORRESPONDENCE.** Apart from his student years, his four years in **Paris**, and his brief visits to **London**, **Berlin**, Vienna, and other centers where people met and discussed academic topics, Leibniz

lived in relative isolation. In **Hanover**, he complained, he had no one to talk philosophy to other than the electress **Sophie**—Court etiquette discouraged discussion of serious subjects. Partly for these reasons, Leibniz was a prolific correspondent. He engaged in at least 1,000 correspondences of which more than 100 touch on philosophical topics. Some of these correspondences constitute valuable introductions to his philosophy and indeed he himself toyed with publishing one of them—his correspondence with **Antoine Arnauld**. Some parts of his correspondence with **Simon Foucher** were published as exchanges in the *Journal des Sçavans*. Not long after he died, his rather adversarial correspondence with **Samuel Clarke** was published. But nearly all of the letters Leibniz wrote remained unread by anyone except the person to whom they were directed until they became the object of scholarly interest. They show the high priority given by Leibniz to this activity and the great trouble to which he was prepared to go to explain his **ideas** to others.

Leibniz tailored the explanations he gave of his philosophy to suit the diverse backgrounds, interests, and presuppositions of his correspondents as he understood them. Some of them—such as the electress and her daughter **Sophie-Charlotte**—had little background, and his explanations for them are among the best introductions to his philosophy in his own words. They are lively and free of jargon but sometimes a little bland and lacking the detail he gave to more demanding correspondents. Many of his correspondents were university educated and, in writing to them, Leibniz fell readily into **scholastic** jargon—unless he thought this might put them off, as it would have put off some of those whose sympathies were **Cartesian**. Leibniz corresponded with a number of members of the Catholic clergy, including the Jansenist Arnauld, the Jesuits **Bartholomäus Des Bosses** and **René Joseph de Tournemine**, and the Benedictine **François Lamy**. In writing to them he sought to find areas of common ground and to gloss over important points of difference such as his rejection of the **Thomist** doctrine of **separated souls**. Leibniz even went out of his way to argue that his philosophy (unlike that of **René Descartes**) could make sense of the problematic doctrine of **transubstantiation**.

Many of Leibniz's philosophical correspondences are substantially published in the original language. Only one volume of the Akademie

series of Leibniz's *Philosophischer Briefwechsel* (covering the period from 1663 to 1685) has been published. But many of the important correspondences have been published, in part or in whole, either as separate editions or in one of the major older editions such as those by Gerhardt or Klopp.

**CORRESPONDENCE, WAY OF.** *See* PREESTABLISHED HARMONY.

**COSMOLOGICAL ARGUMENT.** One of the three main kinds of **arguments for the existence of God**, according to Immanuel Kant's late 18th-century classification. Unlike the **ontological argument**, which is wholly *a priori*, the cosmological argument is based on the factual claim that a world of contingent things exists. Facts about particular things or states can be explained by reference to prior facts in terms of laws of **nature**. However, the fact of the whole **universe**, or total sequence of all things, cannot be so explained in this way. It is therefore concluded that there is a **God**.

Leibniz did not classify his arguments for the **existence** of God, but he frequently used a form of cosmological argument. He characteristically claims, on the basis of his **principle of sufficient reason**, that there must be an explanation both for why the total sequence of things is as it is—when logically there could have been an **infinite** number of other sequences—and for why *any* sequence at all exists. Such a reason, in order to explain the existence and nature of the world, must lie outside or beyond the world; it must be a necessary reason that includes the reason for its own existence in itself (if an infinite regression is to be avoided); and it must be an existent thing if it is to be the basis of the existing world. That is, given the existence of the contingent world, and given the principle of sufficient reason, Leibniz concludes that there must be a being—God—whose existence is necessary and extramundane. “Therefore, since the ultimate ground must be in something which is of **metaphysical** necessity, and since the reason for an existing thing must come from something that actually exists, it follows that there must be some one entity of metaphysical necessity” (AG 150; G vii 303). That the demands of **reason** could have import in the metaphysical realm was a claim that Leibniz shared with **René Descartes**, **Benedict de Spinoza**, and

**George Berkeley.** *See also* ARGUMENT FROM ETERNAL TRUTHS.

**COSTE, PIERRE (1668–1747).** French Protestant clergyman who lived in Amsterdam and established himself as a translator—especially of the writings of **John Locke** and other English writers—into French. He came to England in 1697 as tutor to the son of Lady **Damaris Masham**. His translation of Locke’s *Essay Concerning Human Understanding* was published in 1700. It quickly came to the attention of Leibniz and was an important boost in the next few years to the writing of his *New Essays*. Coste and Leibniz had a limited **correspondence**, in the course of which Leibniz offered a statement of his position on **free will** (AG 193–96; GP iii 400–404).

**CREATION (CREATIO/CRÉATION).** For Leibniz this term denotes the explanation of the **existence** of the things of **nature**—why they exist, why they are as they are—given that things, as conceived by him, have an existence separate to that which is the **cause** of their existence or are **substances** in their own right, really distinct from the creator substance, for “the production of modifications has never been termed *creation*” (*Theodicy*, §395). The **sufficient reasons** for the properties of things are grounded in the simple substances (**monads**) of this world—contrary to **Benedict de Spinoza** and **Nicolas Malebranche**—but since **infinite** other worlds are logically possible, the existence of this world of monads is contingent and therefore stands in need of a sufficient reason itself, which must be grounded in a noncontingent or necessary substance. For Leibniz, creation is a matter of showing how contingent worldly substances can be founded in the necessary substance of **God**. God deduces all the infinite possible **universes** that can be derived from the **eternal truths**. Since, by the principle of **contradiction**, there can be only one actual universe, one of these **possible worlds** must be determined upon by virtue of a sufficient reason that is grounded in necessity—in some aspect of the necessary substance of God. This aspect is not God’s mind but is his goodness—for **reason** alone cannot choose between what are deduced from the eternal truths. Leibniz conceives a necessary substance with infinite goodness to be one that brings about the greatest amount of being that is possible—the maximum variety and

order of being. Accordingly, creation is not *ex nihilo* nor a temporal event in which things that previously did not exist now do. Rather, it is the founding of the contingent substance in necessary substance by the sufficient reason of God's goodness in a logico-ontological, but atemporal, order; hence Leibniz's use of terms such as continuous creation and **emanation**. This concept of creation has its precedent in **Thomas Aquinas**, who, in his *De aeternitate mundi contra murmurantes*, had argued against the notion that the world had a beginning, arguing instead for the notion of a Creator as a continually sustaining cause. Since, for Leibniz, both **corporeal substances** and **matter** are only modes of monads, they do not represent a further stage in creation beyond that of monads.

**CREDIBILITY, "MOTIVES" OF (*MOTIVA CREDIBILITATIS/ MOTIFS DE CRÉDIBILITÉ*)**. Leibniz held that there were rational grounds or "motives" for holding any belief and that there was therefore a basis in **reason** even for matters of religious **faith**. In referring to rational grounds for believing in the **mysteries** of religion or of accepting the **Scriptures** as the testimony of **God**, Leibniz adopted the phrase "motives of credibility" from Catholic theologians. He used the concept more widely, however, holding that there are often reasons for our beliefs that are not immediately before our minds. He supported the project of trying to find reasons for all our beliefs, in preference to **René Descartes**'s method of rejecting any beliefs of which we cannot be certain. *See also* FAITH AND REASON.

**CRITICAL THOUGHTS ON THE GENERAL PART OF THE PRINCIPLES OF DESCARTES (*ANIMADVERSIONES IN PARTEM GENERALEM PRINCIPIORUM CARTESIANUM*)**. **René Descartes**'s *Principles of Philosophy* was written as a formal textbook and contained, in addition to the purely philosophical matter of the "general part," a suitably careful exposition of his views on cosmology. Leibniz had produced many scattered criticisms of Descartes over a long period and his purpose in writing these "Animadversions" seems to have been partly to bring them together but also to put in circulation the critical points he had to make of his great predecessor in a definitive form. The work was written in 1692 and Leibniz sought unsuccessfully to have it published—it was far too

long for a journal, and a long critique in Latin might not by that time have been thought a promising book. Leibniz, indeed, found himself accused soon afterward of seeking to build his own reputation on the ruins of Descartes's—a charge that stung him no less for containing a grain of truth. It may be for this reason that the work was seen by hardly anyone else in Leibniz's lifetime.

*Critical Thoughts* was, nonetheless, by far the most systematic and the most considered critique of Descartes's philosophy that Leibniz produced, covering in order a number of the articles from parts 1 and 2 of the *Principles*. The first part is mainly concerned with epistemology and **metaphysics**, the second with **physics**. *Critical Thoughts* states Leibniz's considered objections to the method of doubt, the project of trying to prove the **existence** of an **external world**, and Descartes's **ontological argument** for the existence of **God**, as well as his views on many other Cartesian topics. Where, however, Leibniz had already published a criticism—for instance, of Descartes's appeal to **clear and distinct ideas** or of his **principle** that the same quantity of **motion** is always conserved—he did not repeat himself. These two particular aspects of Descartes's thought had been criticized in papers Leibniz had written some time before for the *Acta Eruditorum*: respectively, his *Meditations on Knowledge, Truth, and Ideas* and his *Brief Demonstration*.

**CUDWORTH, RALPH (1617–1688)**. One of the most distinguished philosophers of the group known as the “Cambridge **Platonists**.” Cudworth was originally associated with Emmanuel College but became master of Clare and later of Christ's, the college where **Henry More** taught. Cudworth wrote two important books, one on **ethics** (his *Treatise Concerning Eternal and Immutable Morality* was not published until 1731 and Leibniz did not know of it) and one on **metaphysics**. Only the first part of the latter, *The True Intellectual System of the Universe* (1678), was published. It was a very substantial and erudite work and established Cudworth's international reputation. In this book Cudworth sought to defend the corpuscularian philosophy against the charge of **atheism** by arguing for “spiritual plastic powers” that were capable of acting and having purposes even though (like most of Leibniz's **monads**) they were not conscious beings. These plastic powers constituted the spiritual aspect of **nature**,

according to Cudworth, and served as an intermediary between **God** and the natural **order**.

Leibniz studied Cudworth's *Intellectual System* during his stay in Rome in the spring of 1689 and wrote quite full notes, summarizing (in Latin) the points that particularly interested him, including many points of agreement (A VI iv; Nr 351, 1943–58). He received a copy of his own of Cudworth's book from the English philosopher's daughter Damaris, by then Lady **Masham**, around the beginning of 1704, though his **correspondence** with her is not much concerned with her father's philosophy. **Pierre Bayle**, however, had criticized Cudworth's plastic natures and Leibniz was invited to offer his opinion, which resulted in his paper *Vital Principles and Plastic Natures*. Leibniz agreed with Cudworth that something more than the laws of mechanism was needed to explain the formation of an **animal** but thought there was no need to invoke plastic natures.

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**DEATH (MORS/MORT)**. Leibniz held that living things are, strictly speaking, indestructible or, as he sometimes puts it, “naturally **immortal**.” When the gross **body** of an **animal** is destroyed, the animal itself is “enfolded” and diminished so that it ceases to be visible. In the language of the **monadology**: the **monads** that comprise the **matter** of the composite **substance** are dispersed like a scattered herd but the dominant monad remains like a dormant **seed**. It still has a body with organs of sense, however small. At a later stage it may expand and develop, bringing together other monads into a single composite substance, thus returning to the visible world. And so it goes on. The **transformation** of animals through an **infinite** number of cycles of “birth” and “death” has **analogies** with the **Pythagorean** doctrine of the **transmigration** of **souls**. But transformation was consistent, in Leibniz's opinion, with the course of **nature** in a way that transmigration was not, since it did not require sudden leaps from one state to another. Leibniz thought in addition that there was **empirical** support for his view from the findings of contemporary **microscopists**.

Leibniz gives prominence to his theories of death and **generation** in his *New System*, and they are an integral part of his later expositions

of his philosophy. In the *New System* he was at pains to stress that minds or rational souls, being made in the **image of God**, are exempt from the “revolutions of matter.” They are truly immortal but, though their **resurrection** after the destruction of their gross bodies was seen by Leibniz as analogous to the natural processes of regeneration, it follows the laws of grace and not the laws of nature.

**DE BEAUVAL, HENRY BASNAGE.** *See* BASNAGE DE BEAUVAL, HENRY.

**DE CORDEMOY, GÉRARD.** *See* CORDEMOY, GÉRARD DE.

**DEFINITION (DEFINITIO/DÉFINITION).** Leibniz distinguished between two kinds of definitions: those, which he called “nominal,” which did no more than show the connection between how different words are conventionally used, and those he called “real,” which explained the nature or **essence** of a thing. **Thomas Hobbes** admitted only the former kind of definition, and this was partly why, according to Leibniz, he erroneously thought all **truth** was arbitrary. In the case of a real definition, on the contrary, the possibility of the thing being defined is known, either through experience or *a priori*:

When the proof of possibility is presented a priori, the definition is both real and causal, as when it contains the possible production of the thing. And when the definition pushes its analysis back to the primitive concepts without assuming anything that needs a priori proof or its possibility, it is perfect or essential. (*Discourse on Metaphysics*, §24)

If *God* is defined as “the most perfect being,” that is only a nominal definition until it is shown that the **idea** of a most perfect being is a possible one, that is, that it is free of **contradiction**. **René Descartes**, in his **ontological argument**, failed to demonstrate this assumption, according to Leibniz. Leibniz thought he could demonstrate that all the **perfections** were compatible and hence that the idea of a being that had them all was free of contradiction and so a real one. *See also* ANALYSIS.

**DEISM (DÉISME).** Any of various views that admit the **existence** of a **creator** of the **universe** but deny further interventions and hence

**miracles** or **revelations**. **Reason** alone is sufficient to guide our lives, according to the deist, and there is no need for the teachings of the churches. Deism in a broad sense was not uncommon in the 17th and 18th centuries. **Benedict de Spinoza** was sometimes called a deist, as was **John Toland**. The term *deist* was used rather freely in the English polemical literature, of which Leibniz, thanks to his **correspondence** with **Thomas Burnett**, had a passing knowledge.

Deism was, however, allied to **freethinking** and Leibniz's declared opposition to freethinkers and his eagerness to dissociate himself from **innovators** like Spinoza suggest that he should be regarded as an enemy of deism. And indeed some of his beliefs—in particular that, unless **God** continuously creates the world, it will not continue to exist—are in marked contrast with those generally associated with deism.

Nonetheless there are tendencies in Leibniz's writings—those that reflect his **rationalism** in matters of religion—that make Leibniz seem quite close to deism in some matters. When he writes in his preface to the *New Essays*, for instance, that “in our day many people have little regard for revelation on its own or for miracles” (A VI vi 68), it is clear in the context that he himself wants to present religion in a way that will hold the attention of just those people who have no time for pure revelation or miracles. He thought that reason and, specifically, his philosophy could lead one to most of the main **truths** of Christianity—and he had effectively claimed as much in his *Discourse on Metaphysics*. But he acknowledged there and elsewhere that not everyone will use their reason properly and therefore it was necessary for God to reveal himself through Jesus Christ. Revelation was also necessary to know the Christian “**mysteries**,” though it is not clear how important these were for Leibniz personally, if at all. His philosophical **faith** is not as far from the personal—**natural—religion** of many deists and, even though he never engaged in any of the anti-Church rhetoric that some of them did, it is not clear that Church Christianity, with its sacraments and rituals, mattered to him. The **Hanover** clergy who nicknamed him “Lövenix” (meaning “believes nothing” in the local dialect) may have grasped a truth that is obscured for others by Leibniz's tireless work for **Church unity**.

**DEMOCRITUS (c. 460–c. 370 B.C.)**. Greek philosopher who, with Leucippus, first propounded a theory of **atomism**. Leibniz claims to

have been a follower during his atomist phase up to the writing of his *New Physical Hypothesis* in 1670. He refers to him quite frequently and may have owed to him his distinction between real beings, which are indivisible, and **aggregates**, which exist by “convention.” He claimed that Democritus was a precursor of his own view that the **souls of animals** are indestructible.

**DEMONSTRATION (DEMONSTRATIO).** The word *demonstration* is used by Leibniz in both a weak and a strong sense. In the weak sense, a demonstration is “a valid deductive argument,” an argument with premises and a conclusion in which the conclusion follows logically (necessarily) from the premises. In this sense it would involve the speaker in a **contradiction** if he accepted the premises but denied the conclusion of a demonstration. A demonstration, however, might be based on **hypotheses** or on points agreed “for the sake of argument,” in which case its conclusion would not necessarily be true. A demonstration in the strong sense is “a valid deductive argument whose premises are known for certain to be true.” Leibniz sometimes refers to this as “full demonstration.” Although full demonstrations were Leibniz’s ideal, he acknowledged that in many matters where people would like to have them, they have to be content with something less. Leibniz tended to hold that having confused rather than distinct **knowledge** was part of the human lot and that the better knowledge that made full demonstrations possible could only be hoped for in the hereafter. *See also* BEATIFIC VISION; GEOMETRY, METHOD OF.

**DES BOSSES, BARTHOLOMÄUS.** *See* BOSSES, BARTHOLOMÄUS DES.

**DESCARTES, RENÉ (1596–1656).** French **Modern philosopher, physicist, and mathematician** who had an immense influence on the subsequent development of European philosophy. In the late 17th century he remained a controversial figure whose mechanistic conception of physics and dismissal of **final causes** were widely seen as a threat to religion. Moreover the **Cartesian** school held that **matter** consists in **extension** and hence that the **material** world was to be understood in terms of mathematically **intelligible** notions such as size,

figure, and **motion**. The **principle** that matter consists of extension was a very radical one that not only subverted previous philosophical notions but seemed to undermine Catholic teaching about the **Eucharist**.

Descartes's most systematic work was his *Principia philosophia* (*Principles of Philosophy*) of 1644, in which he began with **metaphysics** or "first philosophy" and then proceeded to physics as well as cosmology. In the 17th century this was regarded as his most important work and as a textbook for Cartesians. Subsequently, however, it has been eclipsed by his earlier *Meditations on the First Philosophy* (1641), a work he wrote in a popular style and which is now one of the best-known philosophical writings in any language.

In each of these books, Descartes has a project of starting philosophy from the beginning again and, by using a method of doubt, seeking to rebuild the edifice of **knowledge** on firm foundations. The purpose of the method of doubt was to eliminate whatever could be doubted and so to arrive at a starting point for philosophy that was beyond doubt. Descartes soon concluded that, whatever else he could doubt (including the **existence** of an **external world**), he could not doubt his own existence as a thinking thing. He arrived in this way at the principle encapsulated in the formula *Cogito, ergo sum* ("I think, therefore I am"). But, though he could be certain of his own existence, at least as a thinking thing, he was not equally certain that he had a **body** or, more generally, that there was an external world. There might be, he supposed, an evil genius whose pleasure it was to deceive him and who made him think he was experiencing an external world when in fact he was undergoing a prolonged dream. Descartes sought to dispose of this possibility by **demonstrating** that there is a perfect **God** who is the author of the **universe** to whose nature deception of this kind would be alien. By this means Descartes sought to confute the **skeptic** and establish the reality of the objects of our senses.

Leibniz seems not to have appreciated the importance of Descartes until his stay in **Paris** in the 1670s. At that time he was himself moving quickly into modern mathematics and came to know of some of Descartes's contributions in that area. In philosophy he met up with people, such as **Nicolas Malebranche**, for whom Descartes was a figure of the first importance. But he thought that Descartes had

largely failed in his project of beginning philosophy again. His closest friends in Paris included some who, like him, deplored Descartes's rejection of past philosophy. Among them was **Simon Foucher**, an **Academic skeptic** who was clearly indebted to Descartes but who argued that Descartes had failed to refute skepticism. Leibniz adopted a middle position, though he was actually closer to Foucher on this point than he was to Descartes. He agreed with Descartes that the mind was more easily known than the objects of the senses but he agreed with Foucher that Descartes's argument for an external world had failed.

There are a great many references to Descartes in Leibniz's writings. There are important points of agreement but, early on, Leibniz made little of them and much more of the issues on which they differed. Leibniz agreed with Descartes about rejecting **occult qualities** and explaining the material world in terms of mathematically intelligible notions. But he did not accept the Cartesian corollary that the essence of matter consists of extension. His own view was that more is needed than bare extension and that, when the notion of **force** is added, a conception of matter can be reached that can be reconciled not only with ancient philosophy but with Catholic teaching. He agreed with the Cartesians about not bringing final causes into the details of explanations of **nature** but thought that they had gone too far in rejecting them. On the contrary they had a use, even in physics, and were of the greatest importance in metaphysics.

In the mid-1680s Leibniz published two papers criticizing two fundamental aspects of Descartes's philosophy. In his *Meditations on Knowledge, Truth, and Ideas*, he criticized Descartes' criterion of **truth**, his appeal to **clear and distinct ideas**. In his *Brief Demonstration*, he attacked a cornerstone of Descartes's physics—his principle that a constant quantity of motion is preserved in the universe. In the early 1690s he wrote and sought to publish his *Critical Thoughts on the General Part of the Principles of Descartes*, in which he offered a definitive statement of all the disagreements he had previously expressed in scattered notes and letters but had not published. He also wrote his *Specimen of Dynamics*, in which he sought to establish his new science of **dynamics**, in which his notion of force played the key role that motion had played in Descartes's system.

Leibniz was fond of complaining that Descartes's arguments were insufficiently rigorous. This was, for instance, his complaint against Descartes's **ontological argument** for the existence of God, which assumed without proof that the **idea** of God from which it was derived was free of **contradiction**. Many of these complaints were well founded, but Leibniz's eagerness to make them seems to have made his objections counterproductive in their effect, at least among the French. He was accused, in the 1690s, of seeking to build his own reputation on the ruins of that of Descartes. That may be one reason why, in his later writings, the tone of his references to Descartes changes markedly. It is also true that he found himself having to defend his own philosophy as an alternative to that of very different philosophers such as **John Locke**. And, by comparison with Locke, Descartes came to seem more like a philosophical ally. Descartes, after all, also believed in **innate ideas**, the **immateriality** of the mind, **a priori** proofs of the existence of God, and much else Leibniz hardly noticed before. Descartes's philosophy had previously been stated by Leibniz to be "the antechamber" to the true one—Leibniz diplomatically referred to his own as "the audience chamber" (i.e., closer to the truth but still not quite there). This may reflect his considered position. In his imaginary dialogue with Locke (the *New Essays*), Leibniz's disciple describes himself as a former follower of Descartes—it is the Lockean who was a follower of **Pierre Gassendi**. Leibniz seems to have come to appreciate that, even though many points of disagreement with Descartes remained, not all of them were as important as he had previously made them sound. While it would be a travesty to claim—as it used to be claimed in general histories of philosophy—that Leibniz belonged to the same "school" as Descartes, they both owed (as Leibniz later appreciated) a great deal to **Plato**. Writing in the *Acta Eruditorum*—a journal not mainly sympathetic to Cartesianism—he offered in defense of Descartes: "It cannot be denied that Descartes has made an outstanding contribution. Above all he rightly restored the study of Plato by leading the mind away from the senses and drawing its attention to the doubts of the Academy" (GP iv 468; L 432).

**DESIGN, ARGUMENT FROM.** See TELEOLOGICAL ARGUMENT.

**DESMAIZEAUX, PIERRE (1673–1745).** A French Protestant refugee who settled in England in 1699, establishing himself there as a man of letters who mediated English intellectual life to readers of Continental **journals**. Desmaizeaux was himself a **skeptic** and **free-thinker**, having been influenced by **Pierre Bayle** and Charles Saint-Evremond. His dispatches related not only to **John Locke**, **Isaac Newton**, and the Earl of Shaftesbury, whom he certainly admired, but also to **deists** such as **John Toland**, Anthony Collins, and Matthew Tindal, with whose cause he was a fellow traveler.

Desmaizeaux wrote a reply to Leibniz's *New System* and there was a brief exchange between them (WF 226–45). He particularly disputed Leibniz's claim that the **ancients** had provided a precedent for his claim that **animals** do not strictly suffer **death** but simply undergo a **transformation**. Leibniz was apt to play down the originality of this idea and imply he was no more than a **resuscitator** of a view that had found favor among the ancients. But, in his reply in the *Histoire Critique de la République des Lettres* in 1716, he admitted that the ancients had not gone as far as he did.

After Leibniz's death Desmaizeaux put together a number of Leibniz's unpublished letters and writings (as well as those by **Samuel Clarke**, Newton, and others) in his *Recueil de diverses pieces, sur la philosophie, la religion naturelle, l'histoire, les mathématiques, etc.* (Amsterdam, 1720). Though Leibniz's positions are expressed through his own words, Desmaizeaux's commentaries make it clear that, in the disputes with Locke, Clarke, and Newton, he was on the English side. Desmaizeaux anticipated the verdict of the French Enlightenment that Leibniz was full of the spirit of **system**, too inclined to throw himself into speculations without asking whether they are supported by experience.

**DE SUMMA RERUM (ON THE HIGHEST OF THINGS).** Title given by editors to a collection of works written by Leibniz around 1676. These notes—there is some variation as to which are included by different editors—reflect the state of Leibniz's **metaphysical** thought at the end of his time in **Paris**, and some editors, including Loemker, refer to them as the “Paris Notes.” The title *De summa rerum* is suggested by Leibniz in one of the notes, where he remarks that “**God** is a certain **substance**, a person, a mind” (A VI iii 475) and

adds that such meditations could be called “On the Secrets of the Sublime” or—the Latin is not easy to translate—*De summa rerum*. This suggestion was taken up by the Russian scholar, Ivan Jagodinski, who was the first to publish a collection of these notes in 1913 under the title *Leibnitiana elementa philosophiae arcanae de summa rerum*.

These Paris notes were made by Leibniz for his own benefit, and they do not represent a definitive nor even a consistent statement of his philosophy. Nonetheless they are of great interest for understanding the development of his thought. It has been claimed that Leibniz by this stage had largely evolved his mature philosophical **system**. Many of his important **principles** are to be found there, such as those concerning **contradiction, sufficient reason, harmony, perfection, and plenitude**. He may even have embraced a form of **monadology**. In some respects, however, his metaphysics was at that stage closer to that of **Benedict de Spinoza**, and it has been suggested that he was virtually a **pantheist** in some of these writings.

**DETERMINISM.** See FATALISM; FREE WILL; SUFFICIENT REASON, PRINCIPLE OF.

**DEUS EX MACHINA.** Leibniz seems to have taken this phrase (“**God** as extricator”), which he generally used without explanation, from the Roman poet Horace. In a letter to **Antoine Arnauld**, Leibniz quoted the relevant line of Horace’s *Ars poetica* more fully: “*nodus vindice dignus, cui Deus ex machina intervenire debeat*” (“a knot worthy of such an extricator that God should intervene to untie it”; GP ii 113). Leibniz never doubted the existence of a universal **cause** of all things, but he thought it was inappropriate to invoke the Deity to explain particular **phenomena**. The objection is that those who bring in God when what should be sought is an explanation in terms of secondary causes are taking a lazy shortcut. It is bad philosophy and bad **science** to take such shortcuts. Leibniz made this objection to **occasionalism**, which invoked a deity to explain the apparent **action** of one thing on another and, more particularly, the connection of **mind and body**. He also objected that those philosophers who invoked an *arché* or **world soul** to explain natural phenomena were making use of a deus ex machina.

**DE VOLDER, BURCHARDIUS.** *See* VOLDER, BURCHARDIUS DE.

**DISCOURSE ON METAPHYSICS (DISCOURS DE MÉTAPHYSIQUE).** Leibniz wrote this work in 1686 while stranded in an inn by bad weather. In a letter he mentioned that he had written “a little discourse on **metaphysics**,” and that is the source of the title. The *Discourse* is probably a version of the first, purely philosophical, part of his projected *Catholic Demonstrations*, as is suggested partly by the relative prominence of topics from philosophical **theology** included in it and also by his apparent intention to use it to promote **Church unity**. He sought to obtain the approval of its contents from the distinguished Catholic philosopher and theologian **Antoine Arnauld**, to whom he sent a list of its headings. Arnauld misunderstood the implications of Leibniz’s metaphysics in a way he might not have done had he been sent the full text, which Leibniz lamely said he had not yet had time to get copied. The *Discourse* thus did not serve whatever purpose Leibniz had for it. He later acknowledged it, however, as the first statement of his mature metaphysics, in particular of his theory of **substances** and of the **preestablished harmony** among them, which he developed in correspondence with Arnauld and others and published in his *New System* (1695). Leibniz toyed with publishing it, together with his **correspondence** with the illustrious Arnauld, but never did. It was not published until 1846, when K. L. Grotefend included it with an edition of Leibniz’s correspondence with Arnauld.

The *Discourse on Metaphysics* is divided into three main parts. In the first part (§§1–16) Leibniz states and begins to develop two leading **principles**: that **God** has chosen to **create** the most **perfect** world, and the **inseparable principle**—that it is in the nature of an individual substance to have such a **complete concept** that from it can be derived everything that is true of that substance. The second part (§§17–22) is concerned with **physics** and in particular with **Cartesian** physics, to which Leibniz objects on the ground that its laws of **motion** are inadequate and because of its exclusion of **final causes**. The third part (§§23–31) is concerned with the controversy about **ideas** and with spirits and their relation to God. Leibniz concludes by claiming that the *Discourse* offers a good account of the relation of the **soul** to the **body**, of **immortality**, and of the special excellence of spirits and their membership of the **City of God**, their freedom, and their independence of

everything except God himself. Finally he commends his principles on the basis of their “utility” in supporting the Christian religion.

**DISCOURSE ON THE NATURAL THEOLOGY OF THE CHINESE (DISCOURS SUR LA THÉOLOGIE NATURELLE DES CHINOIS).** See *NATURAL THEOLOGY OF THE CHINESE, DISCOURSE ON*.

**DISCOVERY, ART OF (ARS INVENIENDI/ART D’INVENTER or ART DE DÉCOUVRIR).** Traditionally, the art of finding the **truth**. The phrase was used by **Ramon Lull** and others, and Leibniz appropriated it, in effect claiming to be the first to truly master the art. In his philosophy it becomes the art of reaching new conclusions by a method of strict **demonstration** based on simple concepts or **primary truths**. This art is one that Leibniz thought was little known outside **mathematics** but which he thought could, and should, be extended to other areas such as **ethics** and **metaphysics**. In his *Projet et essai . . . pour avancer l’art d’inventer*, written in the late 1680s (A VI iv 963–70; W 50–58), he reviewed some of the attempts that had been made by others—including, for instance, **René Descartes**, **Thomas Hobbes**, and **Benedict de Spinoza**, as well as **Samuel Pufendorf** and some of the **Aristotelians**—to extend demonstrations to these other areas. Most of these attempts, he claimed, had met with little success. Leibniz himself, however, did not take the art of discovery much further, largely ceasing to refer to it in his later philosophy. See also *SYNTHESIS*.

**DISPUTES, CONFUSION OF (CONFUSION DES DISPUTES).** Leibniz found himself confronted in his own time by interminable controversies in philosophical and religious matters in which the differing parties held their positions dogmatically. Since these positions were not entirely supported by **reason**, it was impossible for reason to settle the disputes. Some were led to adopt a position of **skepticism** and to refuse to accept **principles** unless they were indubitable. This was the method of doubt adopted by **René Descartes**. But Descartes aimed to move beyond skepticism by building on indubitable foundations by means of careful **demonstrations**. Few thought that he had succeeded in his roundabout proof of the reality of the **external world**. His project seems, on the contrary, to have

provided a further stimulus to skepticism. Descartes's one-time follower, **Simon Foucher**, professed to seek **truth** and advance **knowledge** but ended up as an **Academic skeptic**, putting further principles in question and only adding to what Leibniz referred to as the "confusion of disputes" (e.g., GP i 381; MB 130).

Leibniz thought he saw the way out of the confusion of disputes in the method of **geometry** he claimed was adopted by **Euclid**. Euclid did not claim to have demonstrated all his **axioms**, and progress would never have been made in geometry if he had waited until they were available. Though Leibniz praised the long-term project of demonstrating Euclid's axioms, he never seriously doubted their truth. And he thought that in other areas, such as **metaphysics**, progress could also be made by following the example of geometry, by establishing many things with full demonstrative rigor on the basis of a few **hypotheses**:

Then at least we should know that there remain only these few hypotheses to be proved in order to arrive at a full demonstration, and in the meantime we should at least have the hypothetical ones that will lead us out of the confusion of disputes. (GP iv 165; W 36)

**DIVISIBILITY, INFINITE.** *See* INFINITE DIVISIBILITY.

**DOMINANT MONAD.** *See* MONAD.

**DOUBLE KINGDOM (DEUX REGNES).** Leibniz held that there were two sets of laws in operation in the **natural** world. "**Souls** act according to the laws of **final causes**, through **appetition**, ends, and means. **Bodies** act according to the laws of efficient **causes** or of **motion**" (*Monadology*, §79). God has arranged a **preestablished harmony** between the "two kingdoms" so that the two sets of laws are not in conflict but, on the contrary, what happens in accordance with each corresponds to events in the other (A VI iv 1626; P 85). The preestablished harmony makes sense of how souls and bodies can **communicate** with one another. It also underpins, for Leibniz, his reconciliation of the old philosophy with its stress on final causes with the insistence of **Modern philosophers** on admitting only mechanical explanations in **physics**.

**DREAM, LIFE ONE LONG.** *See* EXTERNAL WORLD.

**DUALISM.** A term used in several different ways to refer to different dualities. Those who held, as **René Descartes** did, that **mind and body** are two distinct **substances** are commonly held to be dualists. Leibniz was not a dualist in this sense, since he held that a **soul** without a body is not a **complete substance** and that, on the contrary, all **created** substances involve a union of something like a soul with something like a body. Nonetheless there is a comparable duality for Leibniz in his **double kingdom**, by virtue of which he could say that souls act as if there are no bodies and vice versa, and yet the laws that govern each so **harmonize** that it seems at first as if souls and bodies **interact**, though this appearance is due to a **preestablished harmony**. *See also* MONISM; SEPARATED SOULS.

**DYNAMICS (DYNAMICA).** Leibniz's main contribution to **science** lay in his work on some important concepts in dynamics. **Galileo Galilei** had proposed that objects maintained whatever **motion** they had unless acted upon by another **force**. His work was developed further by **René Descartes**. Leibniz, acting on a suggestion made to him by **Christiaan Huygens**, wrote his *Brief Demonstration* of 1686 as a critique of Descartes's work on dynamics. According to Leibniz the Frenchman had been wrong in not distinguishing between motion and velocity, and he had failed to take mass into account when explaining collisions between bodies. Leibniz argued that "quantity of motion" is a product of mass and velocity:  $mv$  or **momentum**. But this was not the same as the motion of falling bodies, which Leibniz thought was expressible as  $mv^2$ , what he termed *vis viva* or "live force." In this he had come close to the modern expression for kinetic energy,  $\frac{1}{2}mv^2$ .

In his *Principles* **Isaac Newton** had dealt with the interaction between bodies by giving **mathematical** expressibility priority over the coherent description of the **phenomena** themselves. In his *Specimen of Dynamics* of 1695 Leibniz attacked Newton's approach, calling it an idealized **abstraction** that did falsity to the reality of things. There can be nothing that is **infinitely** hard or infinitely elastic, as Newton's theory demanded of **atoms**. Neither could force be transferred instantaneously or at a distance. Motion, Leibniz argued, should be the effect of force; but Newton's notion of force was a mere derivation of velocity and mass, and consequently explained nothing.

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**ECLECTICISM.** The view that **truth** is to be found by reconciling the apparently conflicting views of philosophical schools or **sects**. There were several eclectic schools in ancient Greece. The Greek term *eclectic* means literally “select out” and reflects the eclectic’s search for what to recognize as right and what to discard as mistaken in each school. Eclecticism in the **Renaissance** period was linked to the revival of ancient learning. Leibniz was influenced by his eclectic teachers at **Leipzig** University and he is often interpreted as an “eclectic” philosopher. It is certainly true that he tended to look for what he could agree with in the **systems** of other philosophers and was more than willing to find his views anticipated in the writings of the **ancients**—even to the point of misinterpreting them, as he was accused of doing by **Pierre Desmaizeaux** and others. But having a coherent and defensible system of his own was a priority for Leibniz, and indeed that provided the point of reference from which he presented himself in “eclectic” terms. This is notable at the end of one of his defenses of his *New System* against the criticisms of **Pierre Bayle**:

Consideration of this system also shows that, when we penetrate to the foundations of things, we find better reasons for what the philosophical sects believed than they had: for the lack of substantial reality in the sensible things of the **skeptics**; the reduction of everything to **harmonies** or numbers, **ideas**, and perceptions by the **Pythagoreans** and **Platonists**; the one and the whole of Parmenides and **Plotinus**, yet without any **Spinozism**; the **Stoic** connectedness, which is nonetheless compatible with the **spontaneity** held to by others; the **vitalism** of the **Kabbalists** and hermetic philosophers who put a kind of feeling into everything; the forms and **entelechies** of **Aristotle** and the **Scholastics**; and even the **mechanical** explanation of all particular phenomena by **Democritus** and the **Moderns**; and so on. These truths can all be seen together as if from a single perspective point from which the object, obscured from any other standpoint, shows its regularity and how its parts fit together. (GP vii 523–24; L 496)

If Leibniz is called an eclectic, it seems clear nonetheless that he should be distinguished from those also so-called who only take what attracts them from existing systems without asking whether the selections really fit together. *See also* NEOPLATONISM.

**EFFORT.** *See* **CONATUS.**

**ELIZABETH OF BOHEMIA (1618–1680).** Princess Elizabeth, an older sister of Electress **Sophie** of **Hanover**, was a daughter of Frederick, the elector Palatine, and Elizabeth Stuart—and through her mother a granddaughter of James I of England. She became interested in philosophy and was noted as a critical correspondent of **René Descartes**. She was a convert to Catholicism and retired to the convent of Herford in Westphalia.

Leibniz met Princess Elizabeth when she visited Hanover in 1678, when they had discussions about Descartes and **Nicolas Malebranche**, for both of whom she had considerable respect. Leibniz wrote to her later giving his critical thoughts on **Cartesianism** (A II i 442–54; AG 235–40). He drew the attention of the princess to the absence in Descartes’s **ontological argument** of a proof that **God** is possible, that is, that the concept of God is free of **contradiction**. Leibniz offered his own proof based, as in his notes for **Benedict de Spinoza**, on the identification of the **perfections** of God with the simple forms and on the compatibility of the simple forms with one another.

**EMANATION (EMANATIO).** A **Neoplatonic** doctrine, probably deriving from **Plotinus**, according to which the **universe** is continuously produced by a kind of overflowing of the Divine Nature. The Neoplatonic doctrine does not sit easily with the Christian view that the universe is separate from **God** and **created** as a result of his **free will**. Nevertheless, it was widely adopted by Christian philosophers, including Leibniz, despite the fact that they repudiated the **pantheism** and **fatalism** involved in the Plotinian doctrine. Leibniz had no reservations about using the word *emanation* about the process whereby the universe results from God by a process of continual creation. Although some have thought that Leibniz was a sort of **deist** who believed the universe had been set up at the beginning and then just left to run its own course, he actually believed that created things were totally dependent on God and would slip into nothingness but for God’s work of continuous creation. Emanation is also connected in his mind with other related Neoplatonic doctrines, such as that the universe, and indeed each thing in it, is an “**expression**” or “**mirror**”

of the Divine Nature, though minds express that nature more perfectly than do other things. God's **perfections** are emanated into the universe which is, therefore, as perfect as it can be.

**EMPIRICISM.** The “empirics” were traditionally a group of people, especially in medicine, who rejected theory and claimed to learn from experience only. They were not always taken seriously and the term *empiric* became a synonym for the later term *quack*. Leibniz was familiar with this loose sense of the word *empiric*, and it is in this sense that he allowed that **animals** learned from experience and that people were empirics most of the time.

The term *empiricism* is a later concoction used to refer to the philosophical view that all **knowledge** of the world is derived from the senses. Leibniz certainly thought that empirical work was important in natural **science**. In a prospectus he wrote in the early 1680s on the value and method of natural science (A VI iv, No. 366; L 280–89), he defended the project of natural science in **Baconian** terms and articulated methods of scientific investigation that are largely, if not exclusively, empiricist.

Empiricism as a philosophical doctrine has to make very strong and exclusive claims, for instance, that all our **ideas** come from experience or that all our knowledge is derived from experience. So understood, it is a mistake to call Leibniz an empiricist. To the **scholastic** tag *Nihil est in intellectu quod non fuerit in sensu* (“There is nothing in the understanding that was not previously in the senses”) he unhesitatingly added *nisi intellectus ipse* (“except the understanding itself”) and went on to itemize some **innate ideas** such as being, **cause**, and other **ideas** with which **metaphysics** is specially concerned. As for the knowledge that is derived from the senses, for instance by **induction**, Leibniz claimed that while it can provide us with moral **certainty**, it cannot provide us with the absolute certainty that is sought in science and which can be achieved in the *a priori* sciences of **eternal truth**.

Leibniz was opposed to empiricism at both these points. He offered an alternative to empiricism in his paper *Sense and Matter* (AG 186–92; GP VI 499–508) and in his *New Essays*. But, if Leibniz was not a pure empiricist, he was not—at any rate later on—a pure **rationalist**, either. It is quite characteristic of Leibniz, especially in his

later writings, to offer both empirical arguments and *a priori* arguments for the same conclusion. For instance, in defending his claim that animals do not strictly undergo **death**, he appeals to the observations of the **microscopists** and does not rely only on *a priori* considerations to do with the natural **immortality** of all true **substances** or **unities**.

**ENCYCLOPEDIA** (*ENCYCLOPAEDIA/ENCYCLOPÉDIE*). Leibniz long dreamed of producing an encyclopedia of human **knowledge**. He was depressed by the disorganized state of libraries and produced a catalog for the library of his first patron, **Baron Johann von Boineburg**. He was particularly discouraged by the disorganized state of knowledge of the various branches of the **sciences**, including his one-time special subject, **jurisprudence**. He was, on the other hand, inspired by holistic views of human knowledge, such as those of the **Herborn** encyclopedists. Early on in his career Leibniz produced his *New Method of Teaching Jurisprudence*, and he formed the ambition to produce an encyclopedia that would have what he called universal science at its heart. He wrote several outlines of this work and introductions to it, explaining his universal science. But it would have required a large team of people to produce the encyclopedia itself and so the project would have required the support of an existing learned society or of an exceedingly wealthy patron. Leibniz turned unsuccessfully to the **Royal Society** and the **Académie des Sciences**. He looked in vain for support from princes, including Louis XIV. Leibniz left a large number of manuscripts that relate to the project, many of them included in a volume (iv) of the Akademie series (VI) of his *Philosophische Schriften*.

**ENFOLDING** (*ENVELOPPEMENT*). A term Leibniz used in apparently diverse contexts to suggest something contained and hidden in something else. It features in his account of the theory of **preformation**, where he reports the observations of the **microscopist** Jan Swammerdam—that the parts of a butterfly are already enfolded in the larva, the plant in its **seed**, and the **animal** in the semen (GP vi 517). His own frequently stated theory that animals are not destroyed when they undergo **death** but are only **transformed** as their gross **bodies** disintegrate and their essential natures are reduced and hidden

in **matter** makes a similar use of the verb *envelopper*. This language also features in his discussion of the *inesse principle* and, in particular, of the thought that the **complete concept** of an individual **substance** contains (*enveloppe*) everything that is true of it. In his **correspondence** with **Antoine Arnauld** and elsewhere, Leibniz extends this thought to each individual substance, which he claims “enfolds” everything that will happen to it (GP ii 70). In the *Monadology* the related metaphor of pregnancy is used in the well-known claim that the present state of each simple substance is “big” with its future (§12). These apparently diverse uses of the term *enfold*, insofar as they relate to Leibniz’s theory of substance, seem to represent contrasting philosophical styles and modes of argumentation: the one **exoteric** and *a posteriori*, and the other **esoteric** and *a priori*.

**ENGLAND.** The largest and principal country of Great Britain. In Leibniz’s time England and Scotland shared a monarch but, until the Union of the Parliament in 1707, England and Wales had separate parliament. Leibniz twice visited England, though his business was entirely in **London**, in the 1670s. From the 1690s, with the prospect of his patroness, the electress **Sophie**, being named as the heir to the British crown, he became a keen observer of the English political, religious, and cultural scene. He found in **Thomas Burnett** of Kemnay a **correspondent** who would keep him well informed. Leibniz himself hoped to become the royal historiographer when Sophie’s son, who became heir on her death, acceded to the British throne in 1714. **Georg Ludwig**, however, instructed him to remain in **Hanover**. It is possible that the new king was advised that Leibniz would not be an acceptable figure in England. His controversy with the **Newtonians** and the **Royal Society** about who first discovered the **infinitesimal calculus** was unabated at the time of his death and the legacy of bitterness it engendered was to last for a long time.

**ENTELECHY (ENTELECHIA/ENTÉLÉCHIE).** An **Aristotelian** term Leibniz thought had been rendered unintelligible by the **scholastics** but which he thought he could give sense to as the primitive **force** of a living thing. He frequently used it more or less interchangeably with **monad** or **soul**. In Leibniz’s system, monads all share, though in varying degree, the **perfections** of their **Creator**. In the *Monadology*

and in some other later writings, he made the dubious claim that the etymology of the word *entelechy* implied perfection.

**ENTHUSIASM** (*ENTHUSIASMUS/ENTHOUSIASME*). A term which, in the 17th century, came to mean something like “fanaticism,” especially in relation to religion. Leibniz’s spokesman in the *New Essays*, in which there is an entire chapter devoted to the topic, notes that the term once had a favorable connotation but had come to be applied to “people who believe without **reason** that their impulses come from **God**” (A VI vi 505). Enthusiasts characteristically made claims of special visions or **revelations**. Leibniz was highly skeptical of such people, whom he was inclined to dismiss as “pious frauds.” **Natural religion**, for Leibniz, was a sufficient guide to salvation and, at all events, “we have no need of new revelations” (A VI vi 509). *See also* MYSTICISM; QUIETISM.

**ENVELOPING**. *See* ENFOLDING.

**EPICURUS (341–271 B.C.)**. Epicurus of Samos was, to begin with, a follower of **Democritus**, and an early exponent of **atomism** and **materialism**. **Pierre Gassendi**, whose atomism was imbibed by the young Leibniz, revived his work, though he sought to accommodate it both to **Modern philosophy** and to Christianity. Leibniz was hostile to Epicureanism, which he considered “dangerous to piety.” In his *Two Sects of Naturalists* (A VI iv 1384–88; AG 281–84), Leibniz identified **Thomas Hobbes** as a Modern follower of Epicurus—though he did not accuse Gassendi, whom he would not have accused of **naturalism**. He summarized the opinion of the Epicureans as the belief that all things are corporeal and therefore that there is no afterlife or Providence. Its ethical content he stated as the view that “there is no **happiness** other than the tranquility of a life here below content with its own lot, since it is madness to oppose the torrent of things and to be discontented with what cannot be changed” (A VI iv 1385). Though Leibniz did not fall into the error of making Epicurus the champion of the sensory **pleasures**, he seems not to have learned anything from him.

**ERNST AUGUST (1629–1698)**. The younger brother of **Johann Friedrich**, from whom he inherited the dukedom in **Hanover**. Ernst

August was a man of affairs with little interest in Leibniz’s purely intellectual pursuits. In the hope of impressing him, Leibniz came up with plans for draining the mines in the Harz mountains, which were prone to flooding. The duke was ambitious to extend his domains and importance and to these ends encouraged Leibniz to trace the history of his family—the House of Brunswick-Lüneburg. Leibniz was able to establish that the duke’s family was descended from the Italian House of Este. Leibniz also played an important part in the complex negotiations that resulted in the duke being elevated to elector of Hanover in 1692. It was, however, through his wife, **Sophie**—a granddaughter of James I of England—that the House of Hanover was to achieve its greatest fame. Their son, **Georg Ludwig**, became the first of a line of Hanover monarchs on the British throne.

**ERNST VON HESSEN RHEINFELS (1623–1693).** Born a Lutheran but a convert to Catholicism, Ernst, the landgrave of Hessen Rheinfels, shared Leibniz’s desire to bring about a reconciliation between the Catholic and Lutheran churches. Leibniz met him in 1679 when the landgrave visited the Hanover Library and, after the death of Duke **Johann Friedrich** in that same year, it was to the landgrave that Leibniz turned to pursue his *Catholic Demonstrations* project. In 1686 Leibniz wrote his *Discourse on Metaphysics*, which he believed provided a philosophical basis for reconciling Christians and bringing about **church unity**. He sent summaries to the landgrave, asking him to forward them to **Antoine Arnauld**, who would, Leibniz hoped, certify that these were doctrines a Catholic could entertain. Ernst acted faithfully as a mediator and, despite his frequent attempts to convert Leibniz to Catholicism, he was not to blame for the failure of the project.

**ESOTERIC (ACROAMATICUS/ACROAMATIQUE).** The distinction between an “esoteric” style intended for serious disciples and an “**exoteric**” style intended for the wider public was introduced by ancient Greek philosophers. Leibniz shows his awareness of the distinction and refers to it in his exoteric *New Essays*, where his disciple admits that he himself tried to write in the esoteric style, writing about **ethics** and **metaphysics** “like a **mathematician**” (A VI vi 260). In an important early discussion of styles of philosophy, he wrote

more plainly: “The esoteric [*acroamatic*] is where everything is **demonstrated**” (GP iv 146). He thought that in philosophy one’s doctrines should be based on *a priori* reasoning, where possible, but that more rigorous and abstract reasoning was only appropriate for a select few and that arguments that were *a posteriori* would be more accessible for those who lacked the appropriate background.

The distinction between esoteric and exoteric styles of philosophy was of great importance to Leibniz since he was very concerned to have his philosophy widely accepted. Most of his published writings, including the *New System* and the *Theodicy*, as well as those he had in mind to publish, such as the *New Essays*, not to mention those he wrote for people without a rigorous academic training, were exoteric. Leibniz adopted literary forms in his exoteric writings—such as the dialogue or autobiography—and other devices, such as allusions to matters of topical interest—such as scandals and science fiction—in the hope of retaining the attention of his reader. No such concessions are made in his esoteric writings.

Leibniz’s esoteric writings include papers such as his *Primary Truths* and *A Specimen of Discoveries about Marvellous Secrets of Nature in General*. No one could understand these papers without seeing that Leibniz is laying out his **system** in a demonstrative form. Significantly, it is not known that Leibniz ever showed these papers to anyone else. He attempted to share his esoteric theory of **substance** as derived from his *inesse principle* with **Antoine Arnauld**. But, perhaps because he had difficulty in convincing Arnauld, he also used many of the *a posteriori* arguments for his view of substance that later feature in the exoteric writings he published.

The difference between esoteric and exoteric styles has sometimes been associated with a distinction between a hidden philosophy, which was difficult to understand and likely to provoke censure, and a bland, publicly acceptable philosophy. Leibniz was aware of this dimension of the differentiation, and he speculated that **Pythagoras** did not really believe in the reincarnation and **transmigration of souls** with which his name was popularly associated and that he taught it only as a public philosophy. Some of Leibniz’s interpreters, notably Bertrand Russell, have argued that Leibniz himself had a hidden, rigorous, but heterodox philosophy that he kept to himself, and a public, orthodox one he presented to princesses. But it is not clear that

the princesses for whom Leibniz wrote cared about orthodoxy as such, witness the interest shown by the electress **Sophie** and her daughter **Sophie-Charlotte** in the notorious **freethinker John Toland** and the heterodox **Pierre Bayle**. There is much about Leibniz's exoteric philosophy, moreover, to offend narrow orthodoxy, such as his view about the **plurality of worlds**.

That is not to say that there are no problems of consistency in Leibniz's philosophy. And his deepest thoughts are certainly to be found in his more esoteric writings. But the distinction is not an absolute one. Leibniz was willing to offer relatively superficial accounts of his philosophy or ones that were in other respects tailored to his intended readers in order to avoid putting them off. It is known, for instance, that he omitted some of his more difficult or problematic doctrines (including fate and contingency) from his *New System* and slanted it to make it more acceptable to readers whose sympathies were **Cartesian**. But, as he indicated to his **Paris** correspondent, **Simon Foucher**, he intended to include these doctrines at a later stage "if the public receives these meditations well" (GP i 423). In principle, had all gone well, there is no reason to doubt that Leibniz would have gradually published the more esoteric features of his philosophy in a suitable **journal**. But, as things turned out, even the exoteric versions of his philosophy, as the responses to his *New System* proved, were usually misunderstood, and his philosophy was commonly dismissed almost out of hand—sometimes, ironically, because it was taken to involve **fatalism**.

**ESSENCE (ESSENTIA/ESSENCE)**. The true nature of something and the basis of its properties. Though there may be many **definitions** of a general term, one of them might state the essence of the thing it refers to. Thus, to take a simple example of Leibniz's: "6" is essentially defined as "1 + 1 + 1 + 1 + 1 + 1." The properties of the number 6 follow from this essence. Thus "3 + 3" and "3 × 2" are both properties of the number 6. In his *De summa rerum* Leibniz took this example to illustrate how things originate from **God's** essence. Just as the properties of the number 6 are different from one another and its essence, so, he claimed, "things differ from one another and from God" (A VI iii 519). In his *New Essays*, Leibniz took up **John Locke's** interest in the distinction between real essences and nominal

essences, agreeing that we do not know the real essence of gold, for example, from which its properties, such as fixedness, could be derived. *See also* EMANATION.

**ETERNAL TRUTHS** (*AETERNAE VERITATES/VERITÉS ÉTERNELLES*). Leibniz held that the **truths** of **logic**, **mathematics**, **natural law**, and **ethics** were not only timeless and immutable but independent of even **God's will**. This is an influence from **Platonism**. Eternal truths hold, as he sometimes puts it, in all **possible worlds** and not only in the actual world God chose to **create**. They are **necessary truths** and so to be contrasted with **contingent truths**, which are dependent on the divine will and are true only of the world God chose to create. Leibniz staunchly opposed those, like **René Descartes**, who held that even truths that seem necessary to us are also dependent on God's will. He objected that, if the eternal truths are made subject to God's will, then they become "arbitrary" and make nonsense of our worship of God. "For why praise Him for what He has done if He would be equally praiseworthy for doing the opposite?" (*Discourse on Metaphysics*, §2). Eternal truths are known *a priori* and are contrasted with contingent truths, which are known through experience. The highest principle of eternal truths, according to Leibniz, is the principle of **contradiction**. *See also* ARGUMENT FROM ETERNAL TRUTHS; VOLUNTARISM.

**ETHICS** (*ETHICA*). Ethics, for Leibniz, is the **science** of **wisdom**—a **demonstrative** science that provides us with **eternal truths**; for instance, it tells us about the nature of **happiness** and also how to find it. In a letter of 1679 to his then patron, Duke **Johann Friedrich**, he stressed the importance of discovering a "true theory of ethics" in order to understand the nature of **justice**, **pleasure**, and happiness (A II i 489: cf. L 150).

Leibniz's philosophical psychology is broadly hedonistic, that is, he takes it to be part of our nature to pursue our own happiness. Such a theory is confronted with the problem of why we should care about the happiness of others and be **charitable** toward them. Leibniz seems to approach this question in two not entirely congruent ways. One is to say that we are social in nature, that we are naturally sympathetic to other people, and thus our happiness is bound up with

theirs. The other approach is to appeal to God's justice and to say that, in the **City of God**, no virtue goes unrewarded nor vice unpunished. This may be why he told a **correspondent**, in the context of approving **Plato's** ethics, that ethics and **metaphysics** "demand one another's company" (GP iii 637; L 159). The **harmony** of things requires, for Leibniz, that virtue should be rewarded and vice **punished**. But this requires a metaphysics that provides for **immortality**, as Leibniz's (like Plato's) did.

**EUCHARIST (EUCARISTIA).** A Christian sacrament believed to have been instituted by Jesus at the Last Supper and recorded in the New Testament (Luke 22:19), when he is said to have instructed his disciples to take bread and wine, representing his **body** and blood, in remembrance of him. There is no agreement among Christian denominations about how important such commemorations are or what they mean, but the Catholic Church came to believe that, during the religious service, the bread and wine actually *became* the body and blood of Christ. **Scholastic** theologians sought to make some philosophical sense of this **mysterious** change through a doctrine according to which, in the words of the Council of Trent, "the whole substance of the bread" is changed into the body of Christ and the whole substance of the wine into his blood, "only the appearances remaining." This change was known as **transubstantiation**. Lutherans were not required to subscribe to exactly the same doctrine, and the Eucharist was an issue that created difficulties for **Church unity**. It was also a doctrine to which 17th-century philosophers found it difficult to attach a sense. **René Descartes's** **principle** that the **essence** of **matter** consists of **extension** was one that seemed to Catholic theologians to be a threat to their teaching and Descartes's writings were, partly for this reason, put on the Index of books Catholics were not supposed to read. Leibniz rejected the **Cartesian** principle on philosophical grounds but went out of his way to show how his own account of matter could accommodate the Catholic teaching. Indeed he sought to provide some philosophical defense of it in the context of his early *Catholic Demonstrations* project (A VI i 508–12; L 115–19), and he returned to it in a lengthy treatment in his *Examination of the Christian Religion* (A VI iv 2418–24; Ru 98–117).

**EUCLID (fl. 300 B.C.).** Euklides was a Greek **mathematician** who lived and taught at Alexandria, Egypt. In the 13 books of his *Elements*, Euclid laid the foundations of geometry as it was known right up to Leibniz's time and for a while later. The **science** of geometry became a paradigm of what science should be like and Leibniz was not alone in thinking that the **geometry method** should be extended to areas such as **ethics** and **metaphysics**, where it was hoped that clear concepts and strict **demonstrations** based on **axioms** that were **primary truths** might reduce or even eliminate the endless controversy to which discussions of these areas always seemed to lead.

Later geometers found that Euclid had simply assumed certain axioms that called for proof. **Gilles de Roberval**, whom Leibniz knew in **Paris**, took up this project. Leibniz's view was that Euclid should not be blamed for assuming things without proof, "for he at least established the fact that if we assume a few **hypotheses**, we can be sure that what follows is no less certain than the hypotheses themselves" (GP iv 355; L 384). More importantly, he thought, unless Euclid had been willing to do this, he would never have been able to make progress and so establish a science of geometry that others could later improve. Thus he disagreed with the **skeptics**, such as his friend **Simon Foucher**, who dismissed **systems** in which there were axioms that were neither self-evident nor demonstrated. As Leibniz put it in an important letter to Foucher of 1686:

In the matters of the human sciences we must try to advance and even if the only way to do so was by establishing many things on a few hypotheses, that is still of use: at least we should know that all that remained to reach a full demonstration was to prove these few suppositions, and in the meantime we should have some hypothetical **truths** and escape from the confusion of disputes. This is the method of the Geometers. (GP i 381; MB 130)

Leibniz thus presented himself as the true Euclid of the "human sciences." But he did not entirely reject the standard of full demonstration on the basis of self-evident axioms. His two-pronged strategy in adopting the method of geometry was a matter of priorities. He gave priority to making progress, even though it involved making use of undemonstrated assumptions and treating the standard as an ideal rather than a requirement. In doing this, he took himself to be proceeding in the spirit of Euclid.

**EUGENE OF SAVOY, PRINCE (1663–1736).** Born in **Paris**, a prince of the House of Savoy, Eugene is best known as a soldier in the service of the Holy Roman emperor. Prince Eugene fought with great distinction against the Ottoman Turks in Austria and Hungary. He became more involved in politics but was involved as a commander, with the Duke of Marlborough, at the Battle of Blenheim in 1704 and in many later campaigns. Prince Eugene was noted as a patron of the arts.

He probably met Leibniz on a visit to **Hanover** in 1708 and received him hospitably in Vienna in 1712. The prince was more interested in **theology** than in philosophy and took the opposite position from Leibniz in the controversy about the supposed **natural theology** of the **Chinese**. Prince Eugene seems to have thought well of the *Theodicy* and wanted a summary of it. He was probably a stimulus to the writing of the *Monadology* and was presented with a bound volume of Leibniz's writings that included its companion essay, *Principles of Nature and Grace, Founded on Reason*.

**EVIL (MALUM/MAL).** The contrast term for *good* or *perfection*. For Leibniz, there are three kinds of evil, corresponding to the three kinds of perfection: **metaphysical**, natural, and moral. Metaphysical evil is a reflection of the limitation or imperfection of creatures and so, for Leibniz, as for **Augustine**, its root is in nothingness. Natural evil is passivity or suffering, whereas moral evil is sin. *See also* EVIL, ORIGIN OF.

**EVIL, ORIGIN OF.** The question, how any **evil** could come into a world **created** by a perfect **God**, is one that perplexed **scholastic** theologians and was taken up by Leibniz in various writings, particularly his *Confession of a Philosopher* and his *Theodicy*. The **existence** of some natural and **metaphysical** evil in the world, as Leibniz understood it, is a consequence of the creation being less perfect than the Creator. (If it were as perfect, it would also be God.) But it is more difficult to explain the existence of moral evil, sin, without supposing that God is either unable to prevent it or does not care enough to do so. Leibniz accounts for the existence of moral evil by reference to human **free will**. God knows that people will sin and could prevent them from doing so. But he **concurs** in their doing what they freely

choose to do, even though it is evil, because he can draw a greater good from allowing these evils than by preventing them. Exactly how this can be so is not clear to human beings. But **optimists** (including Leibniz) believe that the **universe**, as the creation of a **perfect** God, must itself be the most perfect possible.

**EXAMINATION OF THE CHRISTIAN RELIGION, THE.** The work entitled *Examinatio christianae religionis* in the Akademie edition of Leibniz's philosophical writings (A VI iv 2356–2455) and dated 1686 was previously known in separate editions as the *Systema theologicum*. Neither title was clearly authorized by Leibniz and neither is really apt for this substantial piece of writing, which is mainly focused on points of Catholic doctrine to which Protestants commonly took exception. Leibniz had written to a Catholic **correspondent**, the landgrave **Ernst von Hessen Rheinfels**, that he wished to write something on the points of controversy between Catholics and Protestants. This text, in which the fact that the author was not a Catholic would not be revealed, was intended to play some part in Leibniz's project for reunion between Catholics and Lutherans. It is likely that this writing was the work now known as *The Examination of the Christian Religion*. It was first published in 1819 together with a French translation under the title *Exposition de la doctrine de Leibnitz sur la religion*. It was translated into English as the *System of Theology* in the 19th century.

The *Examination* is not primarily a philosophical work but it begins with a personal credo or statement of Leibniz's **natural theology** and contains a number of discussions on the main topics of his philosophical **theology**, ranging from **evil** and **free will** to **miracles** and **revelation**, as well as the **beatific vision**, **immortality**, and **resurrection**. See also CHURCH UNITY.

**EXISTENCE (EXISTENTIA/EXISTENCE).** **John Locke** had distinguished an actual **substance** from the mere **idea** of it by asserting that the conception of the former included, additionally, the "idea of substance in general." This idea, however, was not definable: Locke described it as an "I know not what." There are many passages in Leibniz where he concurs with Locke that existence is an indefinable notion, one that can only "be conceived through itself," that "existence

is therefore an uncompounded or unanalyzable notion” (GP i 271). This way of thinking, however, assumes that the definition can only be reached through an **analytic** reduction of the concept into essential qualities.

But, from the late 1670s, Leibniz believed that existence should not be considered an **essence**; rather, existence was an *outcome*, a *consequence*, of the degree of **perfection** that is enshrined in the essence of a thing. This essential degree of perfection determines a possible substance’s tendency, its “striving,” to exist. That things tend to exist rather than not follows, according to Leibniz, from the fact that we know that something exists rather than nothing.

Since something rather than nothing exists, there is a certain urge for existence or (so to speak) a straining toward existence in possible things or in possibility or essence itself; in a word, essence in and of itself strives for existence. Furthermore, it follows from this that all possibles, that is, everything that expresses essence or possible reality, strive with equal right for existence in proportion to the amount of essence or reality or the degree of perfection they contain, for perfection is nothing but the amount of essence. (AG 150)

Invoking a version of the **principle of sufficient reason**, Leibniz argues that the attainment to existence of any possible thing is prevented only by its being incompatible with the maximum realization of perfection. In the case of **God**, whose essence is **infinitely** perfect, the tendency to existence cannot possibly be incompatible with the maximum realization of perfection, therefore he must, necessarily, exist. In the case of finite possible substances, whose individual perfections are limited, their incompatibility or not, hence their existence, depends on whether they are to be included in that one **universe** that will realize the maximum possible perfection. *See also* STRIVING POSSIBLES.

**EXOTERIC (EXOTERICUS/EXOTÉRIQUE).** The distinction between an “exoteric” style intended for the public and an “esoteric” style intended only for those who are more serious about being initiated into the difficulties of a subject is an ancient one. Some of the ancient Greek philosophers, such as **Pythagoras**, were thought to have given out popular doctrines for public consumption and only instructed an inner circle of disciples in their real philosophy. Leibniz

was conscious of the distinction and of the need to write in both styles, more rigorously and **demonstratively** for those who were willing and able to follow him, and more loosely and even conversationally for others.

At the same time it was, for him, a matter of degree. Some of the dialogues he wrote were clearly attempts at writing in the popular style that had made **Nicolas Malebranche**'s name so widely known. Leibniz wrote in an exoteric style for laypeople, such as **Sophie-Charlotte**, queen of Prussia. He tried to write in that style in his unpublished *New Essays Concerning Human Understanding* and in his *Theodicy*, though he admitted that his style was relatively esoteric compared, for instance, with that of **John Locke**. His *New System* might be regarded as relatively exoteric since it does not go into some of the more difficult aspects of Leibniz's thought, focusing on the *a posteriori* rather than the difficult and abstract but demonstrative and *a priori* arguments for his **system**.

**EXPRESSION (EXPRESSIO/EXPRESSION).** In Leibniz's **system**, the **universe** is a reflection of **God**'s nature. Thus he could say that the "virtue" of each **substance** is "to express well the glory of God" (*Discourse on Metaphysics*, §15). Rational minds do this better than other substances, since they can attain to **eternal truths**, and so they can be said to be made in the **image of God**. But all substances, in accordance with their varying degrees of **perfection**, express their **Creator**. Moreover, each substance or individual in the universe is a **microcosm** of the whole universe. It expresses the whole universe from its point of view and therefore expresses every other substance, though not equally well. In this way what happens to any one individual in the universe affects all the others, though not equally. These ideas owed much to **Neoplatonism**. See also CONSPIRE, ALL THINGS; MIRROR, THE MONAD AS A.

**EXTENSION (EXTENSIO/ÉTENDUE).** This concept had played a fundamental role in the **Cartesian physics** that had been dominant until about 1680. For **René Descartes**, all the properties of material **bodies** were explicable in terms of their spatial properties. The **essence** of body was spatial extension, and properties were mere modes of extension. In his *Nature Itself*, Leibniz argued that if this

were the case, then the **matter** of the **universe** would be indistinguishable in its parts and, consequently, **motion** would be impossible. Extension, he claimed, could not be fundamental but must actually arise out of something more primitive. This something was **force**, specifically, passive force or resistance, which is force repeated—or extended—continuously over some part of the **plenum**. That which is extended, the material body of a **corporeal substance**, is a collection of subordinate or passive **monads**. Since **nature** is a plenum, this collection actually contains an **infinity** of these points of passive force or resistance, which are thus repeated continuously or are extended. *See also* EUCHARIST.

**EXTERNAL WORLD.** A doubt about the **existence** of an external world was raised by **René Descartes** in his *Meditations*. Descartes sought to show that it was more **certain** that he existed as a thinking thing than that an external world existed, for a malicious demon might ensure he had all the experiences he had and yet he could be in a perpetual dream state. Descartes sought to demonstrate the existence of a good **God**, from which he inferred that he could not be in a state of perpetual deception since that would be inconsistent with the nature of his **Creator** who, being wholly good, would never deceive. Very few were convinced by this argument. In the case of **Simon Foucher**, for instance, it had the effect of boosting his **Academic skepticism**. In his first letter to Foucher, in which he expresses considerable sympathy with the **skeptical** viewpoint, Leibniz argued that Descartes's conclusion did not follow. Even if it turned out that life was one long dream, he claimed, it would not follow that God was "imperfect" (A II i 248; AG 4). He continued to hold that the existence of an external world could not be **demonstrated**, though it was a matter of the highest moral certainty. Contrary to most skeptics, he was even willing to say that, in a sense, this amounts to **knowledge**.

**EXTRINSIC DENOMINATION** (*DENOMINATIO EXTRINSICA*).

A **scholastic** phrase used to refer to cases where the basis on which a predication is made of something does not lie in the thing itself. Leibniz's example is of a man becoming a widower in India by virtue of his wife's **death** in Europe. The scholastic distinction between in-

trinsic and extrinsic denominations corresponded to properties that were **essential** to something being what it is as opposed to properties that were **accidental**. This distinction might in turn seem to correspond to one between necessary and contingent propositions. However Leibniz's extension of the *inesse principle* to all propositions led him to define this last distinction differently. In statements of his **system**, he frequently asserted that one consequence was "that there are no purely extrinsic denominations." In his *Primary Truths*, for instance, he infers that "whenever the denomination of a thing is changed, there must be a variation in the thing itself" (A VI vi 1646–47; AG 32). That means—to take Leibniz's own example—that there *is* a change in the man in India when his wife dies in Europe even though, as the example implies, he does not yet know of her death. He *is* a widower, though he does not yet know it.

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**FAITH (FIDES/FOI/GLAUBE).** The acceptance as undoubted of a proposition that is proved neither by **demonstrative** argument nor by the evidence of our own senses. Characteristically faith involves putting trust in other people. Leibniz, perhaps following **Augustine** and appealing to his *Usefulness of Believing*, regarded faith in this sense as an important part of ordinary life: "Most of our actions, even in the affairs of common life, rest on faith, and are not on that account less successful in their outcome" (A VI iv 2363; Ru 13). We act on faith when we accept the testimony of others—we trust them to be telling the truth, to be reliable witnesses, and so on—as we do all the time.

Christian faith, which Leibniz thought was essentially the acceptance of the **Scriptures** as the revealed word of **God**, also depends upon the acceptance of the testimony of others, namely, those who claimed to be witnesses to the **miracles** that were the true mark of divine **revelation**. Leibniz took the miracles of the Bible to be historical events, and so Christian faith is **analogous**, in his view, with what is required for nearly all our beliefs about the past. Leibniz thought it necessary to make a rational decision about whether a witness was trustworthy, and so **faith and reason** were never in opposition. In his *Examination of the Christian Religion*, he used the analogy of

someone who is sent to govern a province, who must first submit to “cautious scrutiny of his credentials” (A VI iv 2362; Ru 11) but whose authority must then be accepted. *See also* CREDIBILITY, “MOTIVES” OF.

**FAITH AND REASON.** Leibniz held that religious **faith** was in need of some support from **reason**—what **theologians** called motives of **credibility**. He rejected the view of faith as some kind of unreasoning commitment that was canvassed by **fideists**. He argued that, while it went beyond reason, some degree of rational probability attached to religious belief. Belief in the **mysteries** of the Christian religion, for instance, such as **Creation** and the **Incarnation**, depended upon belief in the Bible. Acceptance of the Bible as the revealed word of **God** depended, in turn, on the historical veracity of the stories about **miracles** and, in particular, of prophecies. Leibniz prefaced his *Theodicy* with the *Preliminary Dissertation on the Conformity of Faith with Reason*, in which he was particularly concerned to reject the view of **Pierre Bayle** that faith was contrary to reason. *See also* AVERROISTS; REVELATION.

**FARDELLA, MICHELANGELO (1650–1718).** A Sicilian priest who taught **mathematics** and **physics** as well as **logic** and **metaphysics**. He formed an early interest in **Augustine** and **René Descartes**, which led him to visit **Paris** in 1678, where he met **Nicolas Malebranche**, **Antoine Arnauld**, Pierre-Sylvan Régis, **François Lamy**, and others. On his return to Italy Fardella became noted as an opponent of the still-prevalent **scholastic** philosophy and a defender of **Cartesian** method. Controversy led him to move from his teaching position in Modena to Venice in the mid-1680s. He became professor of astronomy and meteorology at Padua in 1694. His best-known book is on Augustine’s account of the human **soul**: *Animae humanae natura ab Augustino detecta* (1698). Fardella acquired some notoriety for expressing the view, taken up by **Pierre Bayle** and others, that acceptance of the authority of the Bible does not require one to believe that there is an **external world** of material **bodies**.

Leibniz met Fardella in Venice in 1690 and the two men **corresponded** until 1714. Fardella took a keen interest in Leibniz’s mathematics and played a leading part in securing a good reception in

Italy for his **infinitesimal calculus**. He was also a careful critic of Leibniz's philosophy. It was in an early letter to Fardella that Leibniz first introduced the term *monad* to refer to a "simple **substance**."

**FATALISM.** The view that, since everything is in the control of a higher destiny or Providence, it is inevitable that it will turn out in the way it does. Fatalism is taken to have the implication that what humans do makes no difference. Some of Leibniz's contemporaries, including **Antoine Arnauld**, thought his system was fatalistic since, according to his **preestablished harmony**, everything that happens to a **substance** flows from its own **nature**. Leibniz thought that this showed that **spontaneity** and so, in rational beings, **free will**, was accommodated in his **system**. But others thought that all individuals do is to live out the script written for them by **God**, who gave them their natures and chose to bring just those individuals into being.

**FELICITY.** *See* HAPPINESS.

**FIDEISM.** The view that religion is based on **faith** alone and not at all on **reason**. The term, which was not known to Leibniz, has been commonly applied by later writers to some of those Leibniz criticizes for their dismissal of reason in religion, such as the **Averroists** and **Pierre Bayle**, and for their excessive emphasis on "pure **revelation**." Leibniz thought that people who professed to reject **natural religion** in order to "reduce everything to revelation" were rightly to be suspected of insincerity (A VI vi 68), for it is part of what is meant by "belief" that questions about reasons are appropriate (A VI vi 494). *See also* FAITH AND REASON; *PRELIMINARY DISSERTATION ON THE CONFORMITY OF FAITH WITH REASON*.

**FINAL CAUSES.** One of **Aristotle's** four kinds of **cause**. In 17th-century debates, they were contrasted particularly with *efficient* causes. Final-cause explanations answer the question of *why* something is the case by reference to its purpose, whereas efficient-cause explanations answer the question of *how* something happened by reference to antecedent states of affairs. **René Descartes** held that the natural **sciences** should be concerned only with efficient and not final causes. Leibniz argued repeatedly, for instance, in his *Discourse on*

*Metaphysics* (§§17–22), that the two methods of explanation were compatible and that final-cause explanations could be useful, even in **physics**. See also DOUBLE KINGDOM.

**FIRST TRUTHS.** See PRIMARY TRUTHS.

**FITNESS, PRINCIPLE OF (PRINCIPE DE LA CONVENANCE).**

According to Leibniz, **God** could have chosen to **create** any of an **infinite** number of **possible worlds** but chose, in accordance with his **wisdom** and goodness, to create the one *best* possible world. His choice of the best world and therefore the explanation for any **contingent truth** or indeed the **existence** of any contingent thing was determined by what Leibniz sometimes refers to as the **principle** of “fitness” (*Monadology*, §§46 and 54) or “principle of the best.” The principle of fitness is closely connected with the principle of **perfection**, but Leibniz clearly thought that the “fitness” of things was observable in **nature** and provided one kind of argument for the existence of God (*Principles of Nature and Grace, Founded on Reason*, §11), whereas the principle of perfection was taken to be **a priori**. See also TELEOLOGICAL ARGUMENT.

**FLUX (FLUXUS/FLUX).** Since **time** is a **continuum** in Leibniz’s **metaphysics**, change of **spatial** position among coexistents is not reducible to instants of change separated by nonchange. Likewise, **motion** is not reducible to discrete packets of motion that jump in and out of absolute stasis. The relationship between **monads** is a flux one. Though the body of a **corporeal substance** has its **aggregate** form continually well-founded by virtue of being united to the (dominant) **soul** monad, the actual (subordinate) monads that are gathered together as the **body**, out of the **plenum**, are themselves continually entering and departing the body as it interacts with its environment, “for all bodies are in a perpetual flux, like rivers, and some parts enter into them and some pass out continuously” (*Monadology*, §71). Here Leibniz alludes to Heraclitus, who, in saying that “all things move and nothing remains still,” had displayed the metaphor of the river. **Pierre Bayle** misrepresented Leibniz on this point when, in note H to the article “Rorarius” in his *Dictionary*, he wrote that the soul is “in-

separably united with the first organized body in which God had lodged them.”

**FONTENELLE, BERNARD LE BOVIER DE (1657–1757).** French scientist and writer. In 1686 Fontenelle published a highly successful popularization of the Copernican system entitled *Entretiens sur la pluralité des mondes* (Conversations on the **plurality of worlds**). In 1697 he was elected to the **Académie des Sciences** and, in two years, he became its secretary. As secretary it was his duty to write eulogies (*éloges*) for deceased members and, in 1717, he duly did this for Leibniz, with whom he had been briefly in **correspondence** around the turn of the century.

**FORCE (VIS/FORCE).** In his *Specimen of Dynamics* of 1695, Leibniz criticized **Isaac Newton**’s account of force. He rejected the concept of mechanical interaction because the concept of the **atom** and the concept of transfer of force by collision were irreconcilable. The idea that forces could act at a distance he also rejected as “mere pseudo-explanation.” These were only idealized **abstractions** that added nothing to our **knowledge** of reality. In the explanation of **action**, Leibniz rejects efficient **causes** in favor of **final causes**—that which is the **sufficient reason** for the movement of another is the cause of that action; that “which provides an *a priori* reason for what happens in another” is why “one says it *acts* upon the other” (*Monadology*, §50). This action happens not through direct contact but is “an ideal **influence** of one **monad** upon another” (*Monadology*, §51). This is because each **substance**, insofar as it is a **complete concept** in the mind of **God**, unfolds its properties, including those of position and change of position—**motion**—in a way predetermined by the accommodation or **preestablished harmony** of all substances to each other. Only the **infinite** mind can have *a priori* knowledge, or perceive with absolute clarity, the **relations** of all things to each other. Human knowledge can only ascribe force with the limited clarity of **empirical** knowledge: what *seems*, on the basis of sense data, to be most clearly the cause of action.

The final cause in each substance is referred to by Leibniz variously as its internal or active **principle**, **entelechy**, primitive force,

**appetition**, or **power**. When not (apparently) being realized as action, it is effort or potency. Since nature is **infinitely divisible** and panorganic, there can be no monad that is not *both* the final cause or active principle for some smaller mass of **matter** and the effect or passive principle of some other monad insofar as it has its final cause located in that other monad. Thus every monad possesses both active and passive force to some degree; only God is pure active force or is absolutely **perfect** in power. *See also* ORGANISM; VITALISM.

**FORM.** *See* SUBSTANTIAL FORM.

**FORMS, ORIGIN OF (ORIGO FORMARUM/ORIGINE DES FORMES).** *See* SOULS, ORIGIN OF.

**FOUCHER, SIMON (1644–1696).** A minor French cleric and *savant* who became a canon in his hometown of Dijon but lived in **Paris**. Foucher had moved in **Cartesian** circles but became a critic of **René Descartes**'s philosophy as well as that of **Nicolas Malebranche**. He adopted the standpoint of **Academic skepticism**, that is, the position of the **skeptics** of the later academy of **Plato** in ancient Athens.

Leibniz met Foucher in Paris in the early 1670s and they **corresponded**, off and on, for more than 20 years (GP i 365–427). The two agreed in a number of their criticisms of Descartes, for instance, that he failed to **demonstrate** the **existence** of an **external world**. They were particularly opposed to the Cartesian dismissal of past philosophy and agreed, on the contrary, on the importance of reviving it. Leibniz encouraged Foucher in his project of reviving Academic skepticism and making it relevant to the contemporary philosophical scene. Foucher's method was to expose and question the defensibility of the presuppositions of dogmatic systems, including those of Descartes and Malebranche. He had expressed the expectation that his German friend could, and the hope that he would, produce a more rigorous and defensible **system**. But he was disappointed with the *New System* when it appeared in the *Journal des Sçavans*. He was the first to make a published response, as it had been agreed with Leibniz he would, and his critique contained little that was positive. It struck him as being too **hypothetical**, on the one hand, and unnecessarily entangled by the dogmatic assumptions of

the Cartesians, on the other. Leibniz replied that his system was more rigorous than Foucher had noticed, his **preestablished harmony** following from his view about **unities**, and not as hypothetical as Foucher thought. But there was no way Leibniz could deny that he was offering to solve the problems of the Cartesians over the **mind and body** relationship and not, as Foucher would have preferred, to have undermined the basis on which the problems arose. The scene was set for what might have been one of Leibniz's most interesting philosophical exchanges, but Foucher died before the correspondence could be taken any further. *See also* ANCIENTS; RESUSCITATORS.

**FREEDOM.** *See* FREE WILL.

**FREETHINKER (*ESPRIT FORT*).** Someone whose thought is not constrained by traditional beliefs or accepted authorities (such as the Church) in matters of belief. Leibniz mostly used the term *innovator* to refer to such people and, for his own part, claimed to find that **ancient** and well-received opinions were usually the best. But he did not think that new opinions were necessarily wrong. Someone who went against well-established opinions, however, advanced **paradoxes** and incurred the onus of **demonstrating the truth** of their opinions. Leibniz sometimes did this himself and was concerned, as the freethinker was not, to provide the demonstration.

**FREE WILL (*LIBERTAS VOLUNTATIS/FRANC-ARBITRE*).** An agent freely **wills**, according to Leibniz, when, from among a plurality of possible **actions**, the **reason** for the one particular action chosen is grounded in that agent, that is, is not necessitated by an external **substance**. Thus **God's** will is free since, of the possible actions present to his mind, his choice to **create**, and to create this particular world, is grounded in his **essence** and therefore his goodness, and he was not necessitated in this by the **eternal truths**. In order to make his creation choice (of the best), God must have determined—calculated—beforehand all the actions of all the creatures in this world. But this determination in no way affects the status of the substances he creates as agents in their own right. God is the **sufficient reason** only for their **existence**, not for their actions.

A created **monad** acts freely to the extent that, from a plurality of possible actions present to its **perception**, the reason for the chosen action lies in the internal principle of that monad. In the case of human beings, this free choice is made on the basis of a rational assessment of the alternatives according to which seems the best. In this, Leibniz follows **Aristotle**; more generally, in maintaining the free will of creatures in the face of divine determination, he shares the “compatibilist” views of **Thomas Hobbes**, **John Locke**, and David Hume. In reaching this position, Leibniz was influenced by the work of the Portuguese Jesuit Luis de Molina (1535–1600), whose concept of *scientia media* Leibniz equated to the “knowledge of contingent possibles.” See also FATALISM; INCLINING WITHOUT NECES-SITATING; SPONTANEITY.

**FULGURATION (FULGURATION)**. Literally “lightning flash,” this word was occasionally used by Leibniz as a metaphor for the **creation** of **monads**, particularly when he wished to stress the **em-anative** and continuous sense of the concept. **God** is continually underpinning or sustaining the **existence** of monads by the **suffi-cient reason** of his goodness, hence Leibniz writes that monads “are generated, so to speak, by continuous fulgurations of the di-vinity from moment to moment” (*Monadology*, §47). It is because **time** is a **continuum** that it does not consist of discrete **atomic** in-stants, that there is in any period of time an **infinity** of instants, that “the multitude of momentary states is a mass of an infinity of flashes of the divinity, of whom everything at each instant is a cre-ation” (GP vii 564–65).

**FULL CONCEPT.** See COMPLETE CONCEPT.

**FUTURE CONTINGENTS (FUTURA CONTINGENTIA)**. Accord-ing to many **theological** systems, **God** knows what the future will be and has known everything that will happen since before the begin-ning of **time**. Moreover, everything that will happen is foreordained by God. It seems, then, that everything that happens *must* happen—that there is no contingency in the world and that everything happens by necessity. Leibniz’s answer to this problem is to draw a distinction between what is contingent, though infallible because known by God,

and what is absolutely necessary, which it would involve a **contradiction** to deny. In this way he thought he could distinguish his position from that of a **fatalist**.

– G –

**GALILEI, GALILEO (1564–1642).** Galileo enjoyed a position of preeminence among **Modern philosophers**, particularly because of his pioneering work in the **science of motion** and in developing Copernican astronomy. Galileo’s telescopic observations made it difficult to continue believing that the moon was a celestial **substance** and supported the view it was made of the same material as the Earth. This fueled speculations about the **plurality of worlds**. After the publication of his *Dialogue Concerning the Two Chief World Systems* (1632), Galileo was tried by the Inquisition and spent the rest of his life under virtual house arrest, prohibited from publishing further. Leibniz was, however, later able to study his *Two New Sciences* (1638) and sought to build on his work on motion.

**GASSENDI, PIERRE (1592–1655).** Gassendi was a French Catholic priest who sought to revive the **atomism** of **Democritus** and **Epicurus**, though in a form that was consistent with Christian beliefs, for instance, in the **immortality** of the **soul**. He was a leading participant in the discussions of the new philosophers, corresponding with both **Thomas Hobbes** and **René Descartes**. Leibniz knew the debate with Descartes and sought to mediate in it. It may have partly been the inspiration for the form of his *New Essays*, in which the **Lockean** spokesman is a former disciple of Gassendi and his own spokesman a former disciple of Descartes.

Gassendi wrote a book (*Epistolica exercitatio . . .*, 1630) in which he attacked the “Mosaic philosophy” of Robert Fludd (1574–1637). In what Leibniz called the “fanatical” philosophy of Fludd and others, all action is attributed to **God** and the value of **scientific** investigation into “secondary **causes**” is correspondingly diminished. Leibniz valued Gassendi’s refutation of Fludd and may have derived from it his objections to the **occasionalists** and others whose explanations of **nature** involved a *deus ex machina*.

More generally, Leibniz regarded Gassendi as one of the founders of **Modern philosophy** and admitted that, when he was first attracted to the new philosophy it was to the “void” and the “incorruptible” atoms of Gassendi’s theory. He later rejected this view, but he thought that it might be useful to use Gassendi’s theory in introducing young people to modern science since their imaginations would be engaged by atomism, as his own had been. They could move on later, as he did, to more sophisticated and correct views of the nature of things.

**GENERAL INVESTIGATIONS CONCERNING THE ANALYSIS OF CONCEPTS AND TRUTHS (GENERALES INQUISITIONES DE ANALYSI NOTIONUM ET VERITATUM).** This work (A VI iv 739–88), completed in the same year (1686) as the *Discourse on Metaphysics*, was not published until 1903, when Louis Couturat published it among his *Opuscules et fragments inédits*. Couturat claimed that these notes provided the “**logical** foundation” for Leibniz’s mature **metaphysics**. And certainly they do contain an account of his distinctive theory of **complete concepts** and of the theory of containment that underpinned his *inesse* **principle**, which played an **axiomatic** role in the metaphysics of **substance** expounded in the *Discourse*. An English translation, with an introduction and evaluation, was published by Walter H. O’Briant in 1968.

**GENERAL SCIENCE.** See SCIENCE, UNIVERSAL.

**GENERATION (GENERATIO/GÉNÉRATION).** Leibniz held that living things are indestructible because all **souls** are “naturally **immortal**.” What appears to be the **death** of a living thing is really only a **transformation** of a creature that continues to **exist** in a diminished form. Leibniz thought it “**natural**” that all living things have existed in some form since the **creation** and consequently that there is no “generation” of a new **animal**, strictly speaking. What appears to be the birth of a new animal is merely the transformation—development and enlargement—of something that already exists. Leibniz accepted the theory of **preformation** then in favor with biologists and supported, as he thought, by the findings of contemporary **microscopists**.

Leibniz’s claim that living things always arise out of tiny living things that are not normally visible and that new souls are never cre-

ated was one he qualified in the case of human souls. Humans are rational animals and so, as living creatures, they are no more specially generated than other animals. But, as creatures with minds, gifted with the divine spark of **reason** and made in the **image of God**, they come into being by a special process—a **miraculous** and not a natural process—Leibniz refers to as **transcreation**. See also PREEXISTENCE; SOULS, ORIGIN OF.

### GEOMETRY, METHOD OF (*MÉTHODE DES GÉOMÈTRES*).

The achievements of **Euclid** and other Greek geometers were a source of inspiration to Leibniz and other philosophers of his time, who despaired of the endless controversies of **metaphysics** and looked for a way of resolving them. The method of geometry, as Leibniz understood it, was to put forward **primary truths** that are beyond dispute and to proceed by strict **demonstration** from them. Leibniz frequently claimed that this was his method. In one of his letters to **Antoine Arnauld**, for instance, he claimed to advance by “geometrical demonstrations,” putting forward only two “primary truths”: the principle of **contradiction** and the principle of **sufficient reason** (GP ii 62). In a letter to **Simon Foucher** of the same year (1686), he wrote more tentatively of positing “**axioms**” such as the principle of contradiction, the *inesse* **principle**, and “various other axioms of that nature” (GP i 382). The project as described to Arnauld is more dogmatic and is the one attributed to Leibniz by those who construe him as a **rationalist** philosopher. As described to Foucher, however, it sounds more like finding common ground with an opponent in order, as Leibniz puts it, “to escape from the confusion of disputes” (GP i 381).

It may be wrong to attribute to Leibniz either the view that all the axioms of his **system** were absolutely certain or that some of them were merely **hypothetical**. So far as geometry itself was concerned, he did not regard its axioms as dubious even though he recognized that they had not in fact been demonstrated. He praised the project of **Gilles de Roberval** to demonstrate axioms that Euclid himself had assumed without proof. But he did not condemn Euclid for proceeding even though he lacked the proof of his axioms:

It is not easy to demonstrate all the axioms, or to break the demonstrations down into what is intuitively known. And if people had wanted to

wait until that could be done, we might even now have no science of geometry. (A VI vi 370)

Compared to Foucher, who rejected all metaphysics where the axioms had not been demonstrated, Leibniz thought the history of geometry provided this important moral. Using the method of geometry, for Leibniz, was above all a matter of using a strict method of demonstration rather than refusing to put forward hypotheses. For then, as he put it in his *Critical Thoughts* of 1692, “we can be sure that what follows is as certain, at least, as the hypotheses themselves” (GP i 355; L 384). *See also* DISPUTES, CONFUSION OF.

**GEORG LUDWIG (1660–1727).** The son of **Ernst August**, elector of **Hanover**, and his wife **Sophie**, a granddaughter of James I of **England**. Georg’s mother was named in the Act of Succession of 1701 and, in accordance with that Act, he succeeded through her as George I of Great Britain in 1714. George not only saw little value in Leibniz’s intellectual achievements but was very dissatisfied with his failure, as it seemed, to give sufficient priority to producing the history of the House of Hanover he had undertaken. Leibniz hoped to become historiographer of England and **Caroline**, Princess of Wales, interceded on his behalf, but the king merely expressed doubt as to whether Leibniz was capable of writing history. Leibniz was instructed to remain in Hanover and get on with the job he was supposed to do.

**GOD (DEUS/DIEU/GOTT).** The most perfect being who is the **creator** of everything else and on whom everything else depends for its continued **existence**. In Leibniz’s **system**, God as a pure spirit is fundamentally different from other **substances**, all of which have **bodies**.

God has indispensable roles in Leibniz’s **metaphysics**. First, Leibniz had **defined** individual substance in terms of his **principle** of the identity of **indiscernibles**: that an individual substance must contain all the properties it will ever have as **essential** properties. **Knowledge** of reality, according to his subject-predicate **logic**, is accordingly represented in those propositions of which the concept of the subject is comprehended completely—a comprehension that involves infinite **analysis**. Thus Leibniz’s definition of substance, whether actual or

possible substance, presupposes the existence of an **infinite** mind—God’s mind. Second, *given* this definition of substance and Leibniz’s analysis of **nature** that the world consists of a plurality of these substances, Leibniz argues that, since other **possible worlds**—or arrangements of these substances—are logically possible, the substances of nature must have a contingent existence. He then argues that a substance is now required to act as the **sufficient reason** for the existence of contingents—why *this* particular world exists—a substance that must be extramundane and which, to avoid an infinite regress, must be a necessary substance: God’s substance. That a necessary substance with an infinite mind is *required* by Leibniz’s metaphysics does not of itself prove the existence of that substance. Leibniz must advance arguments for the existence of God separately.

The role that God has in relation to the world is as the sufficient reason for its existence. He is, in other words, its creator. As a necessary substance, he is independent of all others and is thereby unlimited or infinite or **perfect**. As infinite and necessary, he must therefore be one, undivided and eternal. As the reason for the existence of all other substances, and having necessary substance himself, his **power** must be infinite. His mind too must be without limit—hence he is omniscient. And Leibniz believes that God’s goodness is boundless and not negated by any **evil** property.

In his relationship to the world he has created, God is different from it, since he is one unlimited substance whereas the world consists of infinite limited substances. But he is also intimately connected with it insofar as created substances depend on him for their continued existence, and, as contingents born out of the **preestablished harmony**, they reflect his omniscience and his **will**. This dependency on God also has a moral significance since God is also head of the republic of minds. *See also* ARGUMENTS FOR THE EXISTENCE OF GOD; CITY OF GOD; CONCURRENCE OF GOD; GOD AND THE WORLD; IMAGE OF GOD; LOVE; THEISM; *THEODICY*; THEOLOGY.

**GOD AND THE WORLD.** The relationship between **God** and the world, or between uncreated and created **substance**, was a vexed one in early **Modern philosophy**. The issue hinges on whether or not a thing **created**, and therefore dependent on another for its **existence**,

should be conceived of as a substance in its own right. **Benedict de Spinoza**, whose position provides the best contrast with Leibniz's, argued that the things of the world are not substances but mere modes of the one eternal divine substance. Leibniz, in his **metaphysics**, however, claims that **monads** are substances insofar as they enshrine the **sufficient reasons** for their properties. Yet, since their existence is contingent—the world could, **logically**, have been otherwise—another substance must exist that enshrines the sufficient reason for their existence.

Leibniz always asserted the contingency of created substances. That they do not necessarily follow from the concept of the divine substance—as the properties of a triangle follow from its concept—and thus cannot be mere modes of God, is why Leibniz is not a Spinozist or a **pantheist**. God is transcendent to the world insofar as he is without any limitations—he is infinite with respect to his **power**, his **reason**, and his **will**—hence the created monad is always limited in these respects, “for God could not give the creature everything without making of it a God” (*Theodicy*, §31). On the other hand, monads **emanate** from God, in that he is their originating **causal** substance, and they exist in his mind as **complete concepts** that additionally have been instantiated by his will into actual substances.

In this sense, Leibniz conceives of God as being immanent in every created monad, for each is derived of his substance, reflects his omniscient comprehension of all things in terms of its place in the **preestablished harmony**, and reflects his will with regard to its very creation: “For one clearly sees that all other substances depend on God, . . . that God is all in all, and that he is intimately united with all creatures” (*Discourse on Metaphysics*, §32). This immanent aspect of the God–world relationship has led to pantheistic interpretations of Leibniz. However, since he also conceives God to be transcendent to the world, his position is essentially **theistic**. *See also* DEISM.

**GRACE, LAWS OF.** *See* MIRACLES.

**GRAVITY (GRAVITAS/GRAVITÉ).** **Isaac Newton's** theory of gravity postulated a **force** that acted between bodies at a distance—without any intermediary physical interactions—and instantaneously. Leibniz declared such a force “**miraculous**” and said that it could

have no place in explaining **nature**. In fact, he argued, it explained nothing—it was an “**occult quality**.” It cannot explain how gravity alters the velocity of bodies because it is itself derived from mass and velocity: it is not a real thing apart from bodies and their **motions**.

In his *New Physical Hypothesis* of 1671, Leibniz had sought to explain the motions of the planets about the sun in terms of the “vortex” theory. Sun and planets existed in an ether of superfine particles. The rotation of the sun caused a vortex in this ether by means of the physical interactions among its constituent particles, and this vortex of particles effectively pushed the planets along their circular courses. This rehabilitated gravity from being a miraculous to a regular force, one that transmitted itself through physical interaction and did so in a finite time.

Later, in the *Specimen of Dynamics* (1695), Leibniz realized that transfer of force by **atomic** interaction was conceptually impossible, that any such transfer was, in fact, tantamount to **action** at a distance and so was in violation of his law of **continuity**. He concluded that change could only be explained in terms of **final causes**, as properties flowing from the **appetitions** of **monadic** substances, with **cause** and effect between **substances** to be understood as, ultimately, one concerning the priority of **relations** between the **ideas** of these substances as they exist in the mind of **God** in **preestablished harmony**.

**GREAT CHAIN OF BEING.** *See* CHAIN OF BEING, GREAT.

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**HANOVER.** A town in north Germany that, in Leibniz’s youth, was the capital of the principality of Brunswick-Lüneburg-Calenberg. Its duke in the early 1670s, **Johann Friedrich**, admired Leibniz and shared with him his interest in promoting **Church unity**. In 1673 the duke offered Leibniz the posts of librarian and councilor in Hanover. Though he would have preferred to remain in **Paris** and delayed taking up the post, Leibniz eventually agreed. From 1676 until his death in 1716, Hanover was his base, though he sought opportunities to travel when these could be justified to his employer.

Leibniz was not entirely happy in Hanover, missing the intellectual stimulus provided by life in **Paris** or **London**, and his prodigious activity as a **correspondent** was one consequence of his relative isolation. Moreover his later employers, **Ernst August** and **Georg Ludwig**, had no interest in subjects like philosophy and, he once wrote, if it were not for the electress **Sophie**, such matters would hardly be mentioned in Court circles. It was to please his later employers that Leibniz embarked on his history of the House of Brunswick, though he became bogged down in preliminary studies and failed in his attempt to become historiographer of **England** when Georg Ludwig succeeded to the English throne as George I in the “Hanoverian succession.” The new king ordered Leibniz to remain in Hanover.

Leibniz died in Hanover and his vast legacy of papers was kept secure there. Hanover became the center for Leibniz studies, where scholars have been drawn to study the unpublished manuscripts. It is also the home of the preeminent Leibniz society, the Leibniz Gesellschaft, which publishes the *Studia Leibnitiana*. See also *CODE OF THE LAW OF THE PEOPLES (CODEX JURIS GENTIUM DIPLOMATICUS)*. Image 4 is a photograph of the Leibnizhaus in Hanover.

**HAPPINESS (FELICITAS/BONHEUR)**. “Happiness,” for Leibniz, is “the state of lasting **pleasure**” (GP vii 43: cf. L 425). He distinguished between the ephemeral pleasures of the senses and the more durable intellectual pleasures, such as the delight in the **harmony** and **beauty** of the world. To **love** someone, according to Leibniz, is to take pleasure in their happiness, and the love of others is, he thought, a source of happiness on the side of the person who loves. Perfect happiness is to be found through loving **God**, for Leibniz, which means delighting in God’s **perfections** as well as in the happiness of all other **souls**. God loves all the souls in the **City of God**, of which he is the monarch, so that the flourishing of his empire “consists in the greatest possible happiness of the inhabitants” (*Discourse on Metaphysics*, §36). The absence of happiness is an **evil**, for Leibniz, and constitutes a problem (though he did not regard it as insuperable) for his belief that this is the best of all **possible worlds**. See also **OPTIMISM**.

**HARMONY (HARMONIA/HARMONIE)**. Harmony was a leading metaphysical **idea** for Leibniz from early on in his philosophical de-

velopment. It is what he termed “**unity** in multiplicity” and combines **order** and variety or **plenitude**. The world is hugely varied but, at the same time, “all things **conspire**.” This makes the world **beautiful** and is a source of **pleasure**—indeed of **happiness**—to all rational creatures, not least to **God**, who **created** it. “God created the world,” he wrote, “according to the maximum possible harmony or beauty” (GP vii 74). **Music** and art are, for Leibniz, fundamentally human creations of harmony and therefore beauty. **Science** uncovers the underlying harmony of the **universe** and so leads people to wonder and delight in God’s creation. Leibniz himself strove to reflect the deep harmony of the world in his own **metaphysics**, which brought out, or so he intended, how things in the world are fundamentally the same—they are all **monads** or composed of monads—even though at another level the world seems to be populated by a vastly rich diversity of things.

Leibniz’s system of “**preestablished harmony**,” as he came to call it, is a special exemplification of the harmony in God’s creation. He seems to have arrived at it many years after he took on his more general commitment to harmony as a leading idea. He had come to the view that no created substance could **cause** any change in any other and so needed to explain why events fitted one another in the way they appear to do in what is commonly seen as a causal network. His view was that the changes in the **accidents** of substances arise **spontaneously**, that is, from their own natures, and not from outside **influences**. It is this that distinguishes his **system** from **occasionalism**, not the preestablished harmony itself, with which occasionalists had no difficulty in agreeing. *See also* ANALOGY; CHAIN OF BEING, GREAT; HERBORN; PERFECTION; TELEOLOGICAL ARGUMENT; WISDOM.

**HELMONT, FRANCIS MERCURY VAN (1614–1698).** A Flemish courtier, physician, **alchemist**, **kabbalistic** philosopher, and publisher of controversial religious writings. Francis was the only surviving son of the famous medical chemist Jan Baptista van Helmont (1574–1644), whose works he published. Born a Catholic, the younger Helmont attracted the attentions of the Inquisition and spent some years in a prison in Rome even though no formal charges were made against him. Thereafter he gave up the land he inherited in the

Brabant and spent his time traveling in Protestant countries. He spent several years in England, where he became physician to the ailing philosopher, Lady **Anne Conway** (c. 1630–1679), causing a scandal when the two joined the Quakers. Helmont assisted **Knorr von Rosenroth** in collecting some of the materials for the latter's *Kabbala denudata* (1677 and 1684), the first Latin translation from the Hebrew of key kabbalistic texts, especially of those of the Lurianic Kabbalah.

Helmont was an old friend of Leibniz's patroness, Electress **Sophie**, and her father's family and made an extended visit to **Hanover** in 1696, when Leibniz was involved in discussions of his ideas. Leibniz himself had known Helmont since the early 1670s and, although he often found the kabbalistic philosopher unnecessarily obscure or tendentious, he valued his conversation and was broadly sympathetic to his philosophy. Helmont was particularly associated with a version of the doctrine of the **transmigration** of souls. Leibniz disagreed with this doctrine as intended, though he could give a "good sense" to it.

Helmont did not know Latin, and his books mostly arose by a precarious process whereby he would hold forth and others would take notes, which they then wrote up on his behalf. Leibniz, who would write his opinions of Helmont's books for the electress, thought that some of the books he had seen that were produced in this way did Helmont less than justice. This may be why he allowed himself to be involved in the writing of Helmont's last work, his *Thoughts on Genesis* (1697). Leibniz added some of his own ideas to the exposition of Helmont's thoughts and to that (limited) extent he was a coauthor and not merely a ghost writer.

**HERBORN.** A German university town, with which were associated a number of leading **eclectic** and **Neoplatonic** philosophers in the early 17th century. Among these were Johann Heinrich Alsted (1588–1638) and Johann Heinrich Bisterfeld (1605–1655), who particularly attracted the young Leibniz's attention in the late 1660s. From the Herborn philosophers, Leibniz learned about **Ramon Lull**, and they seem to have inspired his interest in the art of **combinations**. Alsted's seven-volume *Encyclopedia* (1630) was a source of inspiration to Leibniz's early ideas for an **encyclopedia** of all the **sci-**

**ences.** Bisterfeld may also have been an important early influence on Leibniz's views about universal **harmony**.

**HESSEN RHEINFELS, ERNST VON.** *See* ERNST VON HESSEN RHEINFELS.

**HIGHEST OF THINGS, ON THE.** *See* DE SUMMA RERUM.

**HISTOIRE DES OUVRAGES DES SAVANTS.** **Henri Basnage de Beauval** took over the editorship of the Amsterdam periodical *Nouvelles de la République des Lettres* in 1687 and renamed it *Histoire des Ouvrages des Savants*. Leibniz wrote some clarifications of his *New System* for the **journal** and contributed other pieces to it later, such as his *Vital Principles and Plastic Natures* of 1705.

**HOBBS, THOMAS (1588–1679).** English philosopher, author of the now-classic book on political theory *Leviathan*. Hobbes was best known to Leibniz through a trilogy he intended to develop, on the basis of the **mechanical philosophy**, a connected view of the physical world, of human beings, and of the citizen. The trilogy, called the *Elements of Philosophy*, had already appeared in separate parts—*De corpore* (1655), *De homine* (1658), and *De cive* (1642)—but these were not collected together until 1668. In 1670 Leibniz made a careful study of Hobbes, and his early work on **motion** was influenced by *De corpore*. He was also much impressed by Hobbes's suggestion that all thought was a kind of computation, which inspired his ambition to produce a **logical** calculus.

But, although some of the early influences of Hobbes may have remained with him, Leibniz was fundamentally opposed to Hobbes's philosophy on several counts. He opposed his **materialism** in **metaphysics** and what he took to be his tacit denial of **immortality**. For some time, Leibniz projected a book on the mind (*De mente*) that would, or so he claimed, complement and complete Hobbes's work. He criticized Hobbes's view that all **definitions** were “nominal” and hence that the **truths** that depend on them are arbitrary and not **eternal truths** (A VI iv 20–24; AG 268–72). He strongly disagreed with Hobbes's **political philosophy** because of its commitment, as it seemed to Leibniz, to equating might with right and to making **justice** arbitrary.

**HUYGENS, CHRISTIAAN (1629–1695).** Dutch **mathematician** and **physicist** of international distinction, who held a salaried post with the **Académie des Sciences** from its foundation. His *Traité de la lumière* (1690) was a major contribution to optics. During Leibniz’s stay in **Paris** he learned a good deal from Huygens about new developments in the mathematical **sciences**, and they carried on an extensive **correspondence** after Leibniz’s departure for **Hanover**. In his posthumously published *Cosmotheoros* (1698), Huygens was concerned to offer “conjectures” about other planets. Leibniz knew this work, which he referred to in one of his discussions of the **plurality of worlds** (*New Essays*: A VI vi 473). He approved of Huygens’s use of **analogy** to argue from conditions on our Earth to those on other planets.

**HYPOTHESIS (SUPPOSITIO/HYPOTHÈSE).** Leibniz offered the main claims of his *New System* as a hypothesis and not as something he had **demonstrated** or could fully demonstrate. The suggestion made by doing this is that its support would be *a posteriori*. And indeed he himself noted in his first defense of the new **system** that it was commonly sufficient for a hypothesis “to prove itself *a posteriori*, because it satisfies the phenomena” (GP iv 496). But he went on to add that “when there are other reasons as well, and these are *a priori*, that is even better.”

Hypotheses, insofar as Leibniz was willing to make use of them, were clearly meant to be much more than conjectures. Leibniz did not possess a fully demonstrated system, as he was willing to admit. But his use of hypotheses has to be understood in the context of his method of **geometry**. Ideally use would be made only of **primary truths** and everything would be rigorously demonstrated from them. But, in order to make progress, it is allowable to introduce hypotheses that there are very good reasons for **presuming** to be true even if it is not yet possible to demonstrate them. *See also* PREESTABLISHED HARMONY.

**HYPOTHETICAL NECESSITY (NECESSITAS HYPOTHETICA/NÉCESSITÉ HYPOTHÉTIQUE).** Sometimes also called a “consequential necessity” (“nécessité de consequence”), this is what is necessary as a consequence of an assumption. It is distinguished by

Leibniz from what is necessary in itself or is, as he puts it, an **absolute necessity**. If we suppose, as Leibniz did, a world **created by God**, then everything that happens in it happens as a consequence of God's decrees. But, though that means that everything that happens is hypothetically necessary, and indeed that God knew it would happen when he created the world, that does not mean that it had to happen in the sense intended by **fatalism**. What is *contingent* is not necessary in itself, though it may be hypothetically necessary. Thus, so Leibniz thought, it is possible to reconcile God's foreknowledge and prior ordination of events with human **free will**.

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**IBN RUSHD, ABU AL-WALID MUHAMMAD (1126–1198)**. An Arab scholar known to Leibniz as Averroës whose commentaries on **Aristotle** were highly influential and controversial in the Christian world up to and during the **Renaissance**. Ibn Rushd sought to reconcile philosophy with religious belief by arguing that religious **truth** takes a different form from that of philosophy and that it did not matter if philosophy pointed in a direction different from religion. Controversially, he accepted the **immortality** of the **soul** as a religious truth while holding that philosophy provides no confirmation of it. He was suspected of secretly subscribing to the view that the soul was mortal. **Averroism** was opposed by **Thomas Aquinas**, who argued for a synthesis of **faith and reason**. Leibniz took up the same cause as Aquinas in the *Theodicy* and other works.

**IDEA (IDEA/IDÉE)**. A term widely used by **Modern philosophers** after **René Descartes**, though Leibniz was just as happy to use terms such as *notion* or *concept*. Ideas were thought of as fundamental to philosophy, and so questions about the nature of ideas, the origin of ideas, and how ideas can be reliable guides to **knowledge** were the subjects of often fierce debate as, for instance, when **Antoine Arnauld** attacked **Nicolas Malebranche's** view that all ideas are in **God** and not in our minds. Leibniz adopted a middle position, allowing that all ideas are in God but insisting that we simultaneously had ideas in our minds that corresponded to God's.

Leibniz's thinking about ideas derives, with modifications, from **Plato**. Ideas are, for him, first and foremost in God and only derivatively in us. In a paper on the question, What is an idea? Leibniz wrote:

That the ideas of things are in us means . . . just that God, who created both the things and the mind, has impressed a power of thinking upon the mind so that what it can derive by its own operations corresponds perfectly to the nature of the things. (A VI vi 1369–71; L 207–08)

Leibniz gives as an example the idea of a circle. He held that this concept is an **innate idea**, that it is a source of knowledge of **eternal truths**, and that it is impressed in us by God. Equally he thought that ideas like **justice** were innate and “no less founded in the immutable nature of things, and in the divine ideas, than are the principles of **arithmetic** and geometry” (D IV iii 280; R 71).

Strictly speaking, for Leibniz, all ideas are innate in us since there are no external **causes** of changes in us except God. But he can and did make sense of a distinction between ideas that are occasioned by our senses and those that lie within ourselves. In his *New Essays* he opposed **John Locke's empiricism** about ideas, arguing against the view that there is nothing in the mind that was not previously in the senses. He held, on the contrary, that there are “intellectual ideas” that the mind itself provides us with, among which he included being, **unity**, **substance**, duration, change, **action**, **perception**, and **pleasure**, among a host of others (A VI vi 51).

Leibniz was closer to Descartes at this point. But he was critical of Descartes's appeal to **clear and distinct ideas**, and in his *Meditations on Knowledge, Truth, and Ideas*, Leibniz had sought to improve on Descartes and to draw his own distinctions between different kinds of ideas. See also ABSTRACTION; “SEEING ALL THINGS IN GOD.”

**IDEALISTS (IDÉALISTES)**. Leibniz once referred to **Plato** as “the greatest of the idealists,” by which he seems to have meant those who were opposed to **materialism** (G iv 560; L 578). In this sense of the word, Leibniz himself was certainly an idealist in that he denied that only **matter** is real. But the term is used by other philosophers and by interpreters of Leibniz to mean something else, and there are in

any case problems as to what Leibniz's conception of matter is. If "idealism" is the doctrine that matter does not **exist** but only minds do, then the material objects of the **external world** are only **ideas** in the minds of **God** and creatures, as in the philosophy of **George Berkeley**. But Leibniz is not an idealist in this sense. For him, matter exists, and every mind has a **body**: his concept of the **corporeal substance** necessarily involves both the concept of material body as well as mind. Though not a **substance**, matter is a real and "**well-founded phenomenon**": "I am also far from saying that matter is a *shadow* or even a *nothing*. . . . It is a phenomenon, very real" (AG 227; GP vi 625).

If idealism means that matter exists but not independently of mind—that is, is not a substance—then Leibniz *is* an idealist, for the material body of a corporeal substance necessarily involves a mind, as its unitary principle, and so cannot exist apart from mind. Furthermore, matter, in its very nature, is an **aggregate** of **monads** or mental substances. My **perceptions** of the external world are not produced through mechanical interaction, but unfold from out of my mind according to God's **complete concept** of my mind, which encapsulates the entire (external) world. **Knowledge** of the existence of the external world depends on the proof of the existence of God, since only the **infinite** mind has *a priori* knowledge of substances and the existence of a plurality of substances. Whether the nature of the external world is then interpreted in terms of idealism or not depends on whether its material objects are conceived to exist independently of mind or whether they even exist at all. *See also* RELATIONS.

**IDENTITY, PERSONAL.** *See* PERSONAL IDENTITY.

**IDENTITY, PRINCIPLE OF (*PRINCIPIUM IDENTITATIS*).** The **principle** that everything is identical with itself is, for Leibniz, a **primary truth**. At the beginning of his *Primary Truths*, he gives a number of variant statements such as "A is A," "A is not *not-A*," and "nothing is greater or less than itself" (A VI iv 1644; P 87). When he refers to it as a "principle," it is as an alternative way of referring to the principle of **contradiction**, with which it is **logically** equivalent. For example, in his second letter to **Samuel Clarke**, Leibniz writes

that “the principle of contradiction or identity” is the “great foundation of **mathematics**” (Ar 7; GP vii 355).

**IDENTITY OF INDISCERNIBLES.** See INDISCERNIBLES, IDENTITY OF.

**IMAGE OF GOD (*IMAGO DEI*).** The phrase “image of God” comes from Genesis, and there it is clear that it is the human race alone that was said to be made in **God’s** image. In this spirit, Leibniz often makes a sharp distinction between humans, or at least rational **souls**, and the rest of **creation**. When God confers reason on an **animal** soul, it becomes a moral creature, capable of knowing **eternal truths**, capable of virtue, and eligible for admission to the **City of God**.

But, although this is probably his considered view, at other times Leibniz seems anxious to oppose anthropocentric accounts of the purpose of creation and willing to say that *all* created things are made in the image of God. He frequently wrote of all **substances** as if they were imitations of God. In a **Neoplatonic** vein, he suggested that all created substances are bound to reflect, in varying measure, the perfections of the Creator. Thus, in his *Discourse on Metaphysics*, he suggests that all created substances “imitate” both the **wisdom** and the **power** of God as far as they are able. They imitate his wisdom insofar as they **express** or **mirror**, if only confusedly, everything that happens in the **universe** past, present, and future and this, he suggests, “has some resemblance to an infinite **perception** or **knowledge**” (§9). And, since everything is connected with everything else, every substance is accommodated to every other and so, in a sense, what one substance does affects all the others “in imitation of the omnipotence of the Creator” (ibid.).

There is a tension here, as elsewhere, between Leibniz’s Neoplatonic commitment to **plenitude** and **continuity**, which leads him to stress the similarities between humans and other animals, and his **natural religion**, which tends to make humans into the main reason for God creating the universe. According to the first view, there ought to be creatures so close to humans as to be eligible for any special considerations that are given to humans. In his *New Essays* he claims that “in all probability there are rational animals somewhere that are

superior to ourselves” (A VI vi 473). But **Nature** has seen fit not to challenge human supremacy on Earth, Leibniz explains, and so these troubling creatures have been set at a distance. Leibniz’s philosophy commits him to admitting that there may be all sorts of rational animals other than humans made in the image of God, though, in deference to Christian orthodoxy, it is not a view he sought to emphasize. *See also* CHAIN OF BEING, GREAT; VACUUM AMONG FORMS.

**IMMATERIAL SUBSTANCE** (*SUBSTANTIA IMMATERIALIS/SUBSTANCE IMMATÉRIELLE*). Leibniz did not think that any created **substance** could exist in a disembodied form. This was, for him, partly a **metaphysical** consequence of what it was to be a created thing. The only disembodied substance was the **Creator, God**. Leibniz still undertook to defend “immaterial substances” against the claims of **materialists**, but he took this phrase to refer to substances that were *not merely* material rather than substances that were *wholly separate* from matter. He rejected **René Descartes**’s view of the mind as a separate substance and rejected the **scholastic** doctrine of **separated souls**. Such views of **souls** made **immortality** incredible, he thought. The difficulties with belief in immortality “will simply disappear (in large part at least) when it ceases to be a question of substance separated from **matter**” (A VI vi 68). *See also* BODY.

**IMMORTALITY** (*IMMORTALITAS/IMMORTALITÉ*). Throughout his life, Leibniz was eager to defend what he termed the “natural immortality” of the **soul** against those, such as the **Socinians**, who held that the soul was naturally mortal but could, thanks to the grace of **God**, miraculously survive the **death** of the **body**. In some of his early writings, Leibniz was content to argue that the soul, being an **immaterial substance**, could not be destroyed, because that would involve breaking it into smaller parts, which was not possible since the soul was simple and had no parts into which it *could* be broken. He recognized early on, however, that immortality worth having would presuppose the preservation of **memory** and self-identity. Natural immortality was a characteristic of all true **unities** and therefore of all **monads** and therefore all **animals**. It was, by itself, no guarantee of the preservation of a self to which memory and self-identity

were **essential**. Proper immortality, in which there was reward and **punishment**, required the preservation of the self and was reserved for rational souls. But it depended on Providence, and belief in it was a matter of **faith**. The arguments for the natural immortality of all monads did nonetheless add to the credibility of belief in a future life for rational souls, for, to Leibniz's way of thinking, it was easier to believe in something for which there was some **analogy in nature**. *See also* ETHICS; RESURRECTION; TRANSFORMATION.

**INCARNATION** (*INCARNATIO*). One of the great Christian **mysteries**, in which **God** is believed to have taken on human flesh in the person of Jesus Christ. Leibniz admitted that, as a mystery, it was beyond human comprehension. The philosopher might, however, answer anyone who held that it involved a **contradiction**, and Leibniz wrote replies against the **Socinians**, who held it was contrary to **reason** to assert the divinity of Jesus. He thought, moreover, that a philosopher might also suggest tentative **analogies** within human experience and in this way make mysteries like the Incarnation more believable. **Robert Boyle** had written, in his *Excellency of Theology*, that the difficulty of how the **soul** is affected by the passions of the **body** is a difficulty as great as any mystery in **theology**. In his reading notes on Boyle's book, Leibniz noted, "The difficulty about the union of the **soul and body** is as great as the difficulty about the incarnation" (A VI iii 227). But though the difficulty is as great and it is no more possible to explain the union of the soul and the body than it is to explain the Incarnation, we do have a certain though confused knowledge of the union of soul and body. And so it can, in Leibniz's view, be invoked as an analogy and provide "an analogical understanding" (*Preliminary Dissertation*, §§54–55).

**INCLINING WITHOUT NECESSITATING** (*INCLINER SANS NÉCESSITER*). A phrase derived from an ancient view of astrology that the stars incline without necessitating, that is, that the influence of the stars does not determine human fate absolutely but allows some freedom of **action**. The dictum "*Astra inclinant non necessitant*" occurs in the writings of Cicero and **Thomas Aquinas**. Leibniz refers to this dictum in his *Theodicy* (§43) as a "famous saying" and uses it to explain his view of how **free will** is still possible even

though what we do is **certain** and foreknown by **God**. The **will**, he claims, is “always more inclined toward the course it adopts, but it is never bound by necessity to adopt it” (*Theodicy*, §43). He qualifies the analogy by saying that, even if astrology were true—and he makes it clear he thinks it is without “foundation”—then the stars would form only a part of the total set of “inclinations” that result in a person’s choice. The main point of his allusion to the saying seems to have been to popularize his claim that it is possible to admit determination without **fatalism**. It does not actually add any substance to the claim. The reference to “inclining without necessitating” is a loose way of saying that an outcome may be certain, because it is predictable, but that does not mean it is **absolutely necessary**.

**INCOMPLETE CONCEPT.** *See* ABSTRACTION; COMPLETE CONCEPT.

**INDIFFERENCE, LIBERTY OF (*LIBERTAS INDIFFERENTIAE*).** Some **scholastic** philosophers and **theologians** assumed that true **free will** required a liberty of indifference or equipoise, that is, that someone acts freely when, and only when, nothing inclines their **will** one way rather than another. Leibniz was staunchly opposed to this notion, which is inconsistent with his principle of **sufficient reason**. In many places (notably *Theodicy*, §§45–49) he attacked the notion of a liberty of indifference as “chimerical,” citing the celebrated problem example of Buridan’s ass. The poor ass of the example, being unable to decide between two equally attractive bales of hay, starves to death. Apart from such **paradoxical** consequences, the notion of a liberty of indifference was ruled out for Leibniz by his principle of sufficient reason. His own view is that there is always a “prevailing reason” that determines the **soul** to make its choice, the will being determined to **action** by what it conceives (rightly or wrongly) to be the good.

**INDISCERNIBLES, IDENTITY OF (*PRINCIPIUM IDENTITATIS INDISCERNIBILIIUM*).** The **principle** that no two individual things in the **universe** are exactly alike, or that every individual is identical with every other from which it is indiscernible, that is, with which it shares exactly the same properties. Leibniz usually derived

this principle from the principle of **sufficient reason** and the principle that there are no purely **extrinsic denominations** that have no foundation in the thing itself. He also derived it from the **plenitude** of the most **perfect** universe, which would be as rich and therefore as diverse as possible, containing no duplication of things that differed from each other only numerically as did the basic entities of **atomism**. Though the real basis for Leibniz's endorsement of this principle was *a priori*, he expected it to be confirmed by looking at the world around us. One story about him relates to an occasion when he challenged some who doubted his principle to find two leaves that were identical. They failed, but their success would not have worried him because of the limitations of the senses. *See also* INDIVIDUATION, PRINCIPLE OF.

**INDIVIDUATION, PRINCIPLE OF (*PRINCIPIUM INDIVIDUI/PRINCIPE D'INDIVIDUATION*)**. Leibniz's interest in the **scholastic** philosophical quest for the "**principle**" of individuation—what it is that underwrites the continuing **existence** of an individual as the same individual—dates from his student days at **Leipzig**. In 1663 he wrote, under the supervision of **Jakob Thomasius**, a dissertation with the title *Disputatio metaphysica de principio individui* (Metaphysical Disputation on the Principle of Individuation). The solution to the problem in his mature philosophy is found in his doctrines of a **complete concept** and of the identity of **indiscernibles**. Given that no two individuals are identical, every individual **substance** has a unique complete concept in which is contained all the predicates that are true of it and which underwrites its identity *a priori*. Leibniz later criticized the scholastics for believing that there can exist two things that differ only numerically, suggesting that "their puzzles about what they have called the *principle of individuation*" had arisen from this erroneous belief (GP vii 395; L 700).

**INDUCTION (*INDUCTIO/INDUCTION*)**. The process of inference from observations about particular cases to general conclusions. (It is contrasted with deduction, by means of which it is possible to go from universal propositions to statements about particular cases.) We make inductive inferences all the time, Leibniz acknowledged, but induction is an imperfect process in itself since our conclusions al-

ways go beyond the evidence with which our experience provides us. Indeed, induction by itself, Leibniz thought, cannot lead us to the strictly universal and necessary conclusions that are sought in **science**. Further assumptions are needed to arrive at such conclusions. Leibniz seemed clear that these assumptions would be *a priori* and that induction posed a problem for **empiricism** that it could not solve on its own terms. In an early work, he identified what he called a “principle of physical **certainty**” among the fundamental principles of the sciences: “Everything men have experienced always and in many ways will happen again, e.g., that iron sinks in water” (A VI iv 530; P 9). The certainty attaching to this principle, however, seems to be no more than “moral” or “practical.” See also *A POSTERIORI*.

**INESSE PRINCIPLE.** A **scholastic** principle adopted and adapted by Leibniz who, at least at one stage, saw it as fundamental for his theory of **truth** and thus for his theory of **substance**. The **principle** states that the concept of the predicate of a true proposition is always contained in that of the subject or, more concisely, *praedicatum inest subjecto*. The Latin verb *inesse* means “to be in.” For example, the predicate “2 + 3” is contained in the subject “5,” as can be shown by analysis of the subject concept. By substituting definitional equivalents ( $5 = 4 + 1$ ,  $4 = 3 + 1$ , and  $2 = 1 + 1$ ) and one or two other elementary rules of inference, it is possible to reduce “ $2 + 3 = 5$ ” to the **identity** statement “ $2 + 3 = 2 + 3$ .” The inesse principle thus holds for all truths that are based on the principle of **contradiction**, as Leibniz held that all **eternal truths** were. In his *General Investigations* and his *Discourse on Metaphysics*, however, Leibniz went further and took the inesse principle quite generally to apply to all truths, including **contingent truths**. In section 8 of the *Discourse*, he used it as the basis of his theory of substance, claiming that it was in the nature of any **individual** substance or complete being to have a **complete concept** that contained all its predicates, and so it would be possible to infer from the complete concept of any being all that would ever be true of it.

**God** as an omniscient being may be supposed to actually possess the complete concepts of all individual substances, so the *inesse* principle makes sense of God’s **knowledge** of the world being wholly *a priori*, which it has to be for Leibniz, who took seriously the

proposition that God is a pure spirit. The principle seems, however, to collapse the distinction between **necessary truths** and contingent truths, from God's point of view, and so to lead to **fatalism**, as his correspondent **Antoine Arnauld** at first believed. In his later writings, Leibniz ceased using the principle to derive his theory of substance, perhaps because he was less sure than he pretended to be that he could remove from it all suspicion of fatalism or perhaps because he was content, in the main, to offer more **exoteric** accounts of his philosophy in his later years and did not present his **metaphysics** as a **demonstrative** system. Nonetheless Leibniz never actually repudiated his extension of the principle to contingent truths, and it seems to have remained his model for God's knowledge of individual creatures.

**INFINITE DIVISIBILITY.** According to Leibniz, spatial **extension**, or the distance between objects or across an object, is a **relation** of place, which itself is a property of the **substances** concerned. Place, distance, and spatial extension are not substances but numerical predicates, and as such are only ideal. They need not be treated any differently from number in general. Hence, in the same way that any number can be divided, divided again, and so on ad infinitum, so can spatial extension. It, like number, is a **continuum**. Consequently, as **Aristotle** had maintained against the **atomists** in his *Physics*, there can be no smallest indivisible units of extension or separation, that is, no **atoms** and no **vacua**.

For Leibniz, **nature** is, rather, a **plenum** of **monads**. **Matter**, as what is extended in **space**, must be composed of an **infinity** of such monads. Likewise, temporal extension, or the quantity of **time** lapsed between two states, is a relation of change of state, which is a property of the substances involved. Thus, change of state, succession of phenomena, and temporal extension are not substances but predicates. Like space, time is a continuum and can be divided ad infinitum, with the consequence that there can be no smallest indivisible units of change or time, that is, no instants and no stasis. Nature is, rather, a temporal plenum, and change in matter must consist of an **infinity** of instants, or must be in **flux**.

The **truth** of contingent facts, according to Leibniz, can be reached only by an **analysis** of their **causes**—an analysis that, because of the infinite divisibility of nature, involves “an infinity of shapes and **mo-**

**tions**, present and past, that enter into the efficient cause,” and “an infinity of minute inclinations and dispositions of my **soul**, present and past, that enter into its **final cause**” (*Monadology*, §36).

**INFINITESIMAL CALCULUS.** During his stay in **Paris** Leibniz mixed with a number of **mathematicians** and was encouraged by them—particularly by **Christiaan Huygens**—to do original work in this area. By 1675 he had discovered the fundamental **principles** of the integral and differential calculus. The calculus is fundamental for modern mathematics because it provides a mathematical representation for continuous change. Leibniz’s interest in the calculus is thus not separate from his **metaphysical** interests, for instance, in the **continuum**.

In mathematics, unlike metaphysics, however, there was keen competition to be the first—and to be acknowledged to be the first—to do something new and worthwhile in the subject. Leibniz had seen some of the work done by **Isaac Newton** on the calculus and was later accused of plagiarizing it from his English rival. This accusation was reinforced by the unfavorable verdict of a special committee of the **Royal Society in London**, which held a sort of judicial inquiry into the matter. No one presented any defense of Leibniz’s perspective to this committee, however, and subsequent research has vindicated Leibniz’s claim to have discovered the calculus independently. Newton was certainly the first to discover the infinitesimal calculus, but it is Leibniz’s differential notation, not Newton’s notation of fluxions, that is generally used nowadays. *See also* CONTINUITY, LAW OF; FLUX.

**INFINITY (INFINITAS/INFINI).** **Aristotle**, and later Immanuel Kant, distinguished between the potential infinite and the actual infinite. The *potential infinite* meant that for any (finite) **number**, a greater could always be thought, and this without end. The *actual infinite* meant that there exists an actual number that is greater than every (finite) number. The former was allowed; the latter not. Leibniz utilized this distinction in articulating the difference between **God** and creatures. Concerning this he writes to the electress **Sophie** in 1696 that his “fundamental meditations revolve on two things, namely, about **unity** and infinity” (GP vii 542). Regarding the potential infinite, Leibniz writes that “however great may be a **space**, a

**time**, or a number, there is always another greater than it without end; and that thus the true infinite is not found in a whole composed of parts.” The true or actual infinite “is none the less, however, found elsewhere; namely, in the *absolute*, which is without parts . . . the *positive infinite*” (La 16–17). **God** is oneness—**substance** undivided—and consequently without limit, or infinite, and in that he exists, he is an actual infinite. Creatures are limited substances and hence infinitely less than God, and the world is a **plenum** or infinity of these. However, “infinity, that is to say, the **aggregation** of an infinite number of substances, is, properly speaking, not a whole”—not an actual infinite, or undifferentiated, substance (*Theodicy*, §195).

Like **René Descartes**, Leibniz had deployed the concept of the actual infinite in his **ontological argument** for the existence of God. If the concept of an infinite (unlimited) being is without contradiction, then, as unlimited, he must necessarily exist. Leibniz referred to infinite or unlimited **attributes** as **perfections**. God, as the actual infinite, is accordingly perfect in all ways.

**INFLUENCE (INFLUXUS/INFLUENCE)**. Some **scholastic** philosophers, notably **Francisco Suárez**, sought to explain how one thing acts on another by postulating an *influxus* or influence whereby the being of the “**cause**” flows into its “**effect**.” Leibniz and other **Modern philosophers** rejected this notion as “barbaric” and unintelligible. **René Descartes** tried, but failed, to make sense of how, in his terms, the mind could influence the **body** and vice versa. He postulated a pineal gland as an intermediary but, as the **Cartesians** tended to admit, this story did not meet modern standards of **intelligibility**. Leibniz regarded the common “way of influence” as “incomprehensible” (*New System*, §12). His own system of **preestablished harmony** was presented as an alternative. *See also* INTERACTIONISM; OCCASIONALISM.

**INFLUENCE, WAY OF.** *See* INTERACTIONISM.

**INNATE IDEAS (IDEA INNATA/IDÉES INNÉES)**. The view that some **ideas** are inborn and not acquired through experience and learning is associated with Socrates and **Plato**. Against this view, it was held that there is nothing in the intellect that was not previously

in the senses, a view to which **John Locke** lent considerable support by the arguments of his *Essay Concerning Human Understanding*. Leibniz defended innate ideas against Locke in the preface to his *New Essays*. Locke, he notes, admits ideas of reflection and these, he suggests, we arrive at through reflection on what is already in us: such ideas as being, **unity, substance**, change, **activity, perception, pleasure**, and many others (A VI vi 51). Leibniz also wished to defend, against Locke and others, innate **principles** and **eternal truths**. See also EMPIRICISM; *SENSE AND MATTER, LETTER ON WHAT IS INDEPENDENT OF*.

**INNOVATOR (NOVATOR/NOVATEUR)**. A term of derogation applied to those who would bring novel ideas into religious matters, where, in the 17th century, tradition was generally sacrosanct. Prestige attached in Leibniz's time to innovation in the **mathematical** sciences, and quarrels about who discovered something first were frequent. The quarrel between Leibniz, **Isaac Newton**, and their followers about who first discovered the calculus was remarkable in lasting so many years after their deaths and becoming, for the English, a matter of national pride. But in religious matters, and in such areas as **metaphysics** that bordered on them, it was entirely different. It was necessary, if the opinion of Church authorities mattered, to be careful in metaphysics to underplay what was novel and to emphasize the continuities with past authorities. This made a considerable difference to the style in which Leibniz presented his philosophy, especially in the context of his ecumenical work.

The charge of being an “innovator” is one he thought was being made against him at one stage in his **correspondence** with **Antoine Arnauld**. His reply is indicative both of his sensitivity to the charge and his way of responding to it:

I also wish Mr. Arnauld to know that—contrary to the way he has taken my thoughts—I make no claim to the reputation of being an innovator. On the contrary I generally find that the most ancient and well-received opinions are the best ones. And I do not think someone can be accused of being an innovator just because he produces new **truths**, if he does not overturn established views. (GP ii 20–21)

Leibniz certainly produced “new truths” and quite a number of his major publications (e.g., his *New System*) had the word “new”

prominently in the title. So this qualification is important. Insofar as Leibniz's metaphysics was new—for instance, his **preestablished harmony**—it was quite consistent with received views. Leibniz indeed had a genuine respect for the views of the **ancients** and sometimes—for instance, his view that the apparent birth or **death** of an **animal** is nothing more than a **transformation** of something that is indestructible—encouraged his readers to think what he was saying was not particularly original and that he was resuscitating views that had been put forward before by the ancients. *See also* FREE-THINKER; INFINITESIMAL CALCULUS; RESUSCITATORS.

**INTELLIGIBILITY (*INTELLIGIBILITAS*)**. Terms such as *intelligible* and *unintelligible* were part of the rhetoric of **Modern philosophy**, used in the appeal to **clear and distinct ideas** and in criticizing earlier philosophers, such as the **scholastics** and **Neoplatonists**, for being unnecessarily obscure. Leibniz made use of this rhetoric, though he did not think that intelligibility was a virtue peculiar to the new philosophy. He held, on the contrary, that it was to be found among the **ancients**, especially **Plato** and **Aristotle**, whose good example in this respect had been overlooked by those who claimed to follow them. *See also* INFLUENCE; NIZOLIUS, MARIUS; OCCULT QUALITIES.

**INTERACTIONISM**. The label given nowadays to the common view, endorsed by **René Descartes**, that **mind and body** influence one another. Leibniz referred to it as “the way of **influence**.” By Leibniz's time, the difficulties with this view of the mind–body relationship were already well rehearsed. Since the mind is not in **space** and bodily causation requires the **cause** and the effect to be contiguous, it was unclear how the mind could have any effect on a **body** or vice versa. For this reason, many of the **Cartesians** and others—notably **Nicholas Malebranche**—adopted a view known as **occasionalism**, which in its negative aspect denied that there was any strict causation or agency in the world. In his *New System* and other writings of his mature period, Leibniz agreed with the occasionalists insofar as they were critics of interactionism, though he disagreed with their positive conclusion that the only true cause or agent was **God**. *See also* COMMUNICATION OF SUBSTANCES; INFLUENCE; PREESTABLISHED HARMONY.

**INTRINSIC DENOMINATIONS.** *See* EXTRINSIC DENOMINATIONS.

**INVENTION, ART OF.** *See* DISCOVERY, ART OF.

– J –

**JACQUELOT, ISAAC (1647–1708).** Chaplain to the French Colony in **Berlin** and author of *La Conformité de la foi avec la raison* (1704). Jacquelot met Leibniz in Berlin in 1702 and again several times over the next four years, both in Berlin and in **Hanover**. They also **corresponded** (GP iii 442–82; selections in WF 171–201) about topics such as **free will** and the **existence of God**. Jacquelot attached an appendix to his book in a 1705 edition in which he wrote that freedom in Leibniz’s **system** was a “pure illusion.” I believe that I can move my arm freely, according to Jacquelot, but that is not so if my arm has simply been set up so as to move at the relevant moment. Jacquelot upset Leibniz by claiming that the system of **preestablished harmony** was a “dangerous extreme.” In his reply, Leibniz protested that there was no pleasure in a correspondence where he was being misrepresented so much, where objections were being made that are difficulties for all systems, where no attention was paid to his previous replies, and where he was being charged without proof with “hateful conclusions.” This reply seems to have put an end to the correspondence.

**JENA.** A small town in eastern Germany that became famous for its university, founded in 1558. Leibniz spent the summer semester of 1663 there during his time as a student at **Leipzig**. There he studied under **Erhard Weigel**, who was an important early influence on him. The jurist **Samuel Pufendorf** had preceded him and also learned much from Weigel. Rather later, Leibniz’s protégé, **Christian Wolff**, also studied at Jena.

**JOHANN FRIEDRICH, DUKE OF BRUNSWICK-LÜNEBURG-CALENBERG (1625–1679).** A Catholic convert and ally of Louis XIV, whom he admired, Johann Friedrich nonetheless treated his Protestant subjects well. He met Leibniz in 1671 and showed an interest in the *Catholic Demonstrations* project, sharing Leibniz’s desire for **Church unity**. After Leibniz had lost his connections in **Mainz**,

Johann Friedrich offered him the posts of librarian and councilor in **Hanover**. Leibniz took these posts up in 1676. When Johann Friedrich died, the dukedom passed to his younger brother, **Ernst August**.

**JOURNAL DES SÇAVANS.** A leading French **journal** that played an important part in the exchange of ideas and information in the 17th and subsequent centuries. Founded in 1665 by Denys de Sallo, it is sometimes referred to as the first **scientific** journal. But the aims of the *Journal des Sçavans* were quite broad, reflecting the interests of a largely lay public of learned people (*sçavans*, or *savants* in the more modern spelling). The *Journal*, which was published weekly throughout Leibniz's adult life, included reviews, obituaries, and short articles on a huge variety of topics, including reports of scientific experiments and observations.

Leibniz used **correspondence** as his main means of philosophical exchange rather than notes for inclusion in journals. And it is appropriate that his **Paris** correspondent **Simon Foucher** committed some of Leibniz's letters to him (as well as his own replies) to the *Journal des Sçavans*. Previously he had circulated Leibniz's letters among mutual friends, but in 1686 he encouraged Leibniz to divide his letters into separate parts on different pieces of paper—those that relate to “matters of the sciences” and those that relate to “personal matters” (GP i 387). In this way the French public was first offered some of Leibniz's philosophical thoughts, for instance, about what was wrong with **René Descartes**'s view that the essence of **matter** consists of **extension**.

Leibniz's first public presentation of his philosophy—his **New System**—appeared in two successive issues of the *Journal des Sçavans* in 1695. The *Journal* also contained Foucher's critical response and Leibniz's reply but, at that point, Foucher died and the discussions of Leibniz's *New System* passed to other journals, especially those edited by French Protestant refugees in the Netherlands.

**JOURNALS.** During Leibniz's lifetime, journals became an important instrument of communication among scientists, philosophers, and men of letters generally. The earliest, the *Journal des Sçavans*, had been founded in Paris in 1665 and Leibniz himself helped to found the *Acta Eruditorum* in Leipzig in 1682. Among the other leading journals of the time that contained discussions of Leibniz's philoso-

phy and to which he contributed were the *Nouvelles de la République des Lettres* of Amsterdam (founded in 1684) and its successor, the *Histoire des Ouvrages des Savants* of Rotterdam (founded in 1684), as well as the Jesuit *Mémoires pour l'Histoire des Sciences and des Beaux Arts* of Trévoux (founded in 1701). Leibniz also contributed to the *Transactions* of the **Royal Society**.

Prior to the emergence of journals, the prime means of written communication had been **correspondence**, and it was not until the 1690s that Leibniz himself began to see journals as an important means of pursuing a philosophical discussion as opposed to presenting a technical note in **mathematics** or **physics**. When he did, he seems to have envisaged his potential readers, like his correspondents, as people whose background should influence how he presented his ideas. So, as he told one correspondent, he used **scholastic** language to some extent when writing for the *Acta* of Leipzig and accommodated himself more to “the style of the **Cartesians**” when writing for others such as the *Journal des Sçavans* (GP iii 624).

**JUNG, JOACHIM (1587–1657).** Jung, or Jungius—the Latin name by which he was known in the learned world—was a German **mathematician** and **scientist** who was in some respects a forerunner of **Modern philosophy**. He had held chairs of mathematics and medicine elsewhere but is mainly associated with Hamburg, where he was professor of natural science from 1629 until 1640. His most important work was his *Logica hamburgensis* (1638). Jung was the founder of the Societas Ereunetica, which sought to promote sound science with a stress on **logic** and mathematics and a suspicion of **metaphysics** that has suggested a comparison with the much later logical positivists of the Vienna Circle.

Leibniz had a huge admiration for Jung, ranking him in importance with the other great Modern philosophers and even going so far as to claim that, had he been adequately supported, he would have achieved more than **René Descartes**. Leibniz acquired Jung’s books in 1678 for his employer’s library in **Hanover** and was concerned about the fate of Jung’s manuscripts, many of which were destroyed by fire in 1681. Like Jung, Leibniz saw the formation of societies of learned men as the way to promote the sciences, and Jung may have influenced his view that metaphysics should be reformed through the methods of logic and mathematics. See also

GEOMETRY, METHOD OF; *REFORM OF METAPHYSICS, ON THE.*

**JURISPRUDENCE (*JURISPRUDENTIA*).** Leibniz was a lawyer by training as well as a philosopher and **theologian**. It was appropriate for him to conceive a **science** of “universal jurisprudence” based on **reason** that was distinct from any study of laws and legal practices in particular countries. Universal jurisprudence is the study of the **eternal truths** of **justice** that hold independently of the actual laws of any country and indeed even in the **City of God**.

Leibniz’s contribution to jurisprudence draws on both a tradition of Christian **Platonism** and the well-established tradition of **natural law**. A fundamental question of jurisprudence, on which the possibility of natural law depends, is whether anything can be just or unjust independently of a particular system of law. And this, in the context of universal jurisprudence, is linked to a question that arises from Plato’s dialogue *Euthyphro*, whether what **God** does is just because he does it or whether he does it because it is just. For Leibniz these questions come together as to “whether justice and goodness are arbitrary or whether they belong, as do numbers and proportions, among the **necessary** and eternal **truths** about the nature of things” (L 561; M 51).

Leibniz’s position on these questions is clear enough. He opposes those philosophers, such as **René Descartes** and **Thomas Hobbes**, who would make either human or divine justice (or both) “arbitrary.” He insists that there are eternal laws of justice that are independent of sovereign decrees, even those of the divine being. And jurisprudence is the science of these eternal laws, as much one of the “necessary and **demonstrative**” sciences as are **logic** and **arithmetic**. In an early writing, the *Elements of Natural Law* (1670–1671) (A VI i 459–65; L 131–37), he links his project with the Platonic quest for a true **definition**—particularly the attempt to define *justice* in the *Republic*—and argues that the science of law is a science based, as the true sciences are, on definition and demonstration. *See also NEW METHOD FOR LEARNING AND TEACHING JURISPRUDENCE.*

**JUSTICE (*JUSTITIA/JUSTICE/GERECHTIGKEIT*).** Justice is a central concept of **jurisprudence** and **natural law**—disciplines which were, according to Leibniz, concerned with **eternal truths**. It

follows “certain rules of equality and of proportion” which, he claims, are “no less founded in the immutable nature of things, and in the divine ideas, than are the **principles** of **arithmetic** and **geometry**” (D IV iii 280; R 71). Justice is independent, therefore, not only of the laws of any country but even of God’s decrees. Leibniz’s “universal jurisprudence” led him to seek a **definition** of *justice* that would apply both to human affairs and to the actions of Providence. The word *theodicy* is one he concocted because, as he explained in the draft preface to his *Theodicy*, it means “the justice of God.” God rules over the republic of minds as a perfectly just monarch, and this justice means that the virtuous will be rewarded and the **evildoer** punished.

In his *New Method for Learning and Teaching Jurisprudence* of 1667, Leibniz made use of a received distinction between different kinds and “degrees” of justice, and he returned to this distinction in much later writings on the subject. The lowest kind of justice is to do no harm to anyone. Then there is “equity” or fairness, the principle that everyone should be treated equally and given their due. But, Leibniz argued, **happiness** is the basis of universal justice and so the highest grade of justice was what he defined as “the **charity** of the wise” (GP ii 581; W 567). *See also* *MEDITATION ON THE COMMON NOTION OF JUSTICE*; PUNISHMENT.

– K –

**KABBALAH.** Kabbalah began in 12th-century France with the appearance of the book *Sefer ha-bahir*. This combined, for the first time, Jewish mystical interpretation of the Bible with **Neoplatonic creation** theory. At the end of the 13th century, Moses de Leon wrote the most acclaimed work of Kabbalah, the *Zohar*. He distributed his work in installments, claiming that he had merely copied them from an ancient work that had originally been written in 2nd-century Israel. This myth was responsible for the *Zohar* being considered a *prisca theologia*—that it contained wisdom that had been revealed to Moses but which had not been set down in Scripture. Following the expulsion of the Jews from Spain in 1492, kabbalists reestablished themselves in Italy and Palestine, among other places. In Italy, Pico

della Mirandola (1463–1494), believing Kabbalah to be a *prisca theologia* text, thought it proved the **truth** of the Christian doctrines of the **Incarnation** and the **Trinity**; in his *Nine Hundred Theses* he sought to **demonstrate** this. Johannes Reuchlin (1455–1522) subsequently set about synthesizing Christianity and Kabbalah in his *De arte cabalistica*. In Palestine, Kabbalah underwent a revolutionary development under Isaac Luria. Considered the Messiah by his disciples, Luria taught a radically different cosmological process to that developed in the *Zohar*. It was this version of Kabbalah, in particular, that attracted the attention of the 17th-century Christianizers of Kabbalah, **Christian Knorr von Rosenroth**, **Francis Mercury van Helmont**, and **Anne Conway**. In his *Kabbala denudata*, von Rosenroth included Latin translations of sections of the *Zohar*, numerous works by Lurianic kabbalists, and tracts that sought to synthesize Christianity with Lurianic Kabbalah.

Leibniz probably acquired some knowledge of Jewish Kabbalah through conversations with von Rosenroth. Of Christian Kabbalah, he had read Pico, and one of his teachers at Leipzig, Johann Scherzer (1628–1683), was interested in kabbalistic thought, including the works of Reuchlin. But his most significant involvement was with the Christianized version of Lurianic Kabbalah, as presented in the writings of Helmont and Conway. However, Leibniz seems never to have believed that Kabbalah, or any of its derivatives, were *prisca theologia*. In the writings of Helmont and Conway, Leibniz would have been most interested in the latent Neoplatonism there and would have shared their wish to harmonize the different religions.

**KEPLER, JOHANNES (1571–1632)**. German astronomer who helped to establish the Copernican system. As well as making important contributions to **mathematical** astronomy—notably to confirm that the planets moved in elliptical orbits—Kepler also worked on optics and the theory of the composition of **motion**. Leibniz regarded him very highly and made frequent references to Kepler's belief, which he shared, in a natural inertia of bodies. He knew of Kepler's posthumously published science fiction work, the *Somnium* (1634), an early writing on what a hypothetical traveler found on the moon. *See also* PLURALITY OF WORLDS.

**KNOWLEDGE (COGNITIO/CONNAISSANCE).** Leibniz used the term *knowledge* both in a weak sense that corresponds to ordinary uses and in a strong sense that answers to a philosophical ideal. The strong kind of knowledge is **science** in the sense of *scientia*, which Leibniz defines as “certain knowledge of true propositions” (A VI iv 135). When Leibniz makes distinctions between different kinds of knowledge, as in his *Meditations on Knowledge, Truth, and Ideas*, they can be graded from the lowest to the highest forms of knowledge. The lowest is “obscure” knowledge, as when I have seen something before but do not remember it well enough to distinguish it from other similar things. Even if I can, when the knowledge is said to be “clear,” I may not be able to explain the criteria by which I can tell it apart. And again, even if I can do this, when the knowledge is “distinct,” it may not be “adequate,” since it may involve notions we do not fully understand. It is only adequate knowledge when we are able to give a complete **analysis** of the notions involved. Leibniz admitted it might not be possible to give a good example of adequate knowledge possessed by humans, though he suggested that our knowledge of numbers might be of this kind.

His willingness to admit different grades of knowledge is one reason why Leibniz was untempted by **skepticism**. He was happy to concede that it is not possible to **demonstrate** the existence of an **external world** and claimed that **René Descartes** would have been better advised not to try to do it. He was more than happy to allow that our knowledge of ourselves was better than our knowledge of sensible things. But he was not tempted to infer that we do not “really know” matters of which we could be morally **certain** even if they could not be demonstrated. We may, to some extent, improve the grade of knowledge we have of things and Leibniz aspired to do this. But he accepted it as part of the human condition that our knowledge would not be perfect. A more perfect knowledge was something that, for Leibniz, was reserved for a better life. *See also* BEATIFIC VISION.

– L –

**LABYRINTH.** Leibniz was fond of the comparison between an intractable problem and a “labyrinth,” a comparison that was enhanced for him by the myth of Ariadne and the thread she used to escape

from the labyrinth. The comparison seems to have been suggested to him by a 1631 book entitled *Labyrinthus, sive de compositione continui* by the Belgian **scholastic** philosopher and **theologian**, Libert Fromond (1587–1653). Leibniz always mentioned the problems about the **continuum** when writing about the most difficult “labyrinths of the human mind.” He also mentioned the problems about **free will** and predestination. In his *Preliminary Dissertation*, Leibniz alludes to **Pierre Bayle**’s claim that the difficulties for belief in a continuum or in predestination cannot be resolved and indeed that the objections to these beliefs are “irrefutable” (§24). Since the implication was that these beliefs were contrary to **reason**, Leibniz was eager to claim that he had found the thread by which it was possible to escape from these labyrinths.

**LAMY, FRANÇOIS (1636–1711)**. French Benedictine monk of the Congregation of St. Maur who taught philosophy in the monasteries of Mont St. Quentin and St. Médard. Lamy became a well-known writer whose books included a refutation of **Benedict de Spinoza**. His *De la connaissance de soi-même* (On the Knowledge of the Self)—published in several volumes between 1694 and 1698—offers a defense of **occasionalism**. In a second edition of 1699 Lamy considered the objections of Leibniz’s *New System* to occasionalism and the alternative **system** of **preestablished harmony**. Lamy seems to have found Leibniz’s system initially attractive but was, on reflection, put off it by a number of worries that Leibniz sought to allay. Among these was that the **soul** is not free in Leibniz’s system and that **God** is unjust and capricious. (There is a substantial selection from the exchange translated in WF 133–70.) Lamy’s defense of occasionalism from Leibniz’s charge that it involved God in “perpetual **miracles**” elicited from Leibniz a clarification of his distinction between the **natural** and the miraculous.

**LAW, NATURAL**. See NATURAL LAW.

**LAWS OF NATURE**. See NATURE.

**LEAPS, PRINCIPLE THAT NATURE DOES NOT ACT BY**. See CONTINUITY, LAW OF.

**LEIPZIG.** The city in Saxony where Leibniz was born in 1646 and where he grew up. His father, who was a professor at the university there, died when Gottfried was very young. But unusually Gottfried was allowed access to his late father's library and was reading works of **scholastic** theology when still a child. He entered the university in 1661 and attended lectures on the philosophy of **Aristotle** as well as introductory lectures on **Euclid**. Leibniz defended and published a bachelor's dissertation on the principle of **individuation** in 1663. But it was while an undergraduate that he started reading the writings of **Modern philosophers** (such as **Francis Bacon** and **Pierre Gassendi**) and it was in a grove on the outskirts of Leipzig that he made his decision, as he later claimed, to give up scholastic ideas in favor of the Modern philosophy. In fact he was never to make such a sharp break from the scholastics and generally claimed in later years to have successfully reconciled what was right in both the new and the old philosophies. Perhaps the strongest influences on Leibniz at Leipzig were two of his teachers, Johann Adam Scherzer and **Jakob Thomasius**, who encouraged him in his lifelong tendency to **eclecticism**. Leibniz began his studies of law in Leipzig but was refused his doctorate in 1666 on grounds relating to his youth, prompting him to leave his native town and move to the University of **Altdorf**.

**LETTER ON WHAT IS INDEPENDENT OF SENSE AND MATTER (LETTRE TOUCHANT CE QUI EST INDEPENDENT DES SENS ET DE LA MATIÈRE).** *See* SENSE AND MATTER, LETTER ON WHAT IS INDEPENDENT OF.

**LIGHT, NATURAL.** *See* NATURAL LIGHT.

**LIGHT OF OUR SOUL.** *See* "SEEING ALL THINGS IN GOD."

**LIVING THINGS.** *See* ANIMALS.

**LOCKE, JOHN (1632–1704).** The leading English philosopher of the late 17th century and perhaps the biggest single influence on 18th-century philosophy in England. Locke was a fellow of the **Royal Society** from 1666 and a friend and admirer of both **Robert Boyle** and **Isaac Newton**. His involvement in politics led to his exile in the Nether-

lands during the reign of Charles II. On his return, he was free to publish, and soon his most important works appeared: *Letters Concerning Toleration* (1689), *Two Treatises of Government* (1690), and *An Essay Concerning Human Knowledge* (1690). His *Reasonableness of Christianity as Delivered in the Scriptures* (1695) drew him into controversy.

Leibniz became interested in Locke during the 1690s and was kept informed about him by his diligent correspondent **Thomas Burnett** of Kemnay. Locke was best known to Leibniz as the author of the *Essay*, in which he opposed **innate ideas** and sought to show how **ideas** were derived from the senses. But, partly because of Burnett, Leibniz was well versed in the controversies that the *Essay* engendered—for instance, with the bishop of Worcester—and his view of him was colored by these controversies. He came to think of Locke as a **Socinian**.

Locke's philosophy also aroused the interest of **Sophie-Charlotte**, queen of Prussia, who encouraged Leibniz to write down his views on the *Essay*. This resulted eventually in a substantial commentary that Leibniz dressed up as a dialogue, his *New Essays Concerning Human Understanding*. Leibniz had hoped to engage Locke himself in **correspondence**, but the older philosopher was not forthcoming and, after Locke's death, Leibniz decided not to publish his book. See also MASHAM, DAMARIS.

**LOGIC (LOGICA/LOGIQUE)**. Loosely, the art of reasoning or finding the truth, but more narrowly the **science** of **demonstrative** inference. In the broad sense, logic is the art of finding new **truths** and also the art of judging proposed truth. In that sense it includes methodology, and hence Leibniz could recommend the method of **geometry** as the true logic. In the broad sense, Leibniz's logic included his **in esse principle** as a theory of the nature of truth. Thus his logic has been understood to be the foundation of his **metaphysics**.

In the narrow sense, logic is concerned with formal inferences such as those of the **Aristotelian** syllogism. Here Leibniz made important advances with his universal **characteristic**, going far beyond traditional logic—so much so, indeed, that it is sometimes claimed on his behalf that he was the founder of modern symbolic logic, though modern logic had already been developed independently before Leibniz's contribution was appreciated and his notes began to be published at the end of the 19th century.

Leibniz held that the highest **principle** of logic is the principle of **contradiction**. Logic, in this sense, is the foundation of all the sciences of **eternal truth**. *See also* ARNAULD, ANTOINE; DISCOVERY, ART OF; *GENERAL INVESTIGATIONS CONCERNING THE ANALYSIS OF CONCEPTS AND TRUTHS*; IDENTITY, PRINCIPLE OF; PROBABILITY.

**LONDON**. The chief city of **England** and, after the **Royal Society** was formed, the main center for **scientific** discussion in the late 17th century. Leibniz first visited London in 1673, when England and France were at war with the Netherlands, as part of a peace mission on behalf of the elector of **Mainz**. The mission was a failure but it gave Leibniz an opportunity to demonstrate the model of a **calculating machine** he had constructed to members of the Royal Society. He met with his correspondent **Henry Oldenburg**, one of the secretaries of the Society, as well as with a number of other members, including **Robert Boyle**. Leibniz's notes on the visit show his interest in finding out as much as he could about the state of **mathematics** and the natural sciences in England. The visit was by no means a complete success, however, as the model of his calculating machine he brought with him was not in working order. He was also worsted in an exchange with the mathematician John Pell, who undermined his claim to be doing original work in mathematics by referring him to the work of others with which he was not yet familiar. He was nonetheless elected a fellow of the Society soon after his return to **Paris**.

Leibniz took the opportunity of returning to London in 1676, this time with a working model of his calculating machine, when he was on the way from Paris to take up his new position in **Hanover**. Leibniz later expressed the wish that he were living in a city like London or Paris where he could find people with whom to discuss philosophy. Had his patroness, the electress **Sophie**, lived long enough to become the British queen, he could have expected to find himself in London with some prized position at Court. But her son **Georg Ludwig**, who acceded to the throne in 1714, refused his request to be the royal historiographer and insisted that he remain in Hanover.

**LOVE (AMOR/LIEBE)**. The concept of love is an integral part of Leibniz's moral psychology and is linked with a number of other

concepts. In a paper on **wisdom**, he wrote that “**happiness, pleasure, love, perfection, being, power, freedom, order, and beauty** are all connected with each other” (GP vii 87; L 426). To love someone, according to Leibniz, is to take pleasure in that person’s happiness or perfection.

Leibniz’s account of love is influenced by his broadly hedonistic moral psychology. In the 1690s there was a debate between two eminent French clerics, François Fénelon and **Jacques-Bénigne Bossuet**, in which Fénelon took and Bossuet objected to the view that the true love of **God** must be entirely “disinterested” even to the point that the **soul** should no longer care about its own salvation. Leibniz frequently commented on this debate in his later writings, drawing a distinction between “mercenary love,” in which a person is loved for the pleasure of the lover, and true love, where the pleasure of the lover is derived from the happiness or perfection of the beloved. “We love God above all things,” he wrote in an early work, “because the pleasure we experience in contemplating the most beautiful being of all is greater than any joy that can be imagined” (A VI i 461; L 134). *See also* CHARITY.

**LULL, RAMON (c. 1232–1316)**. A Franciscan monk and philosopher, Lull was responsible for an art of **combinations** that he intended for use in missionary work among the Muslims who comprised the majority in his native island of Mallorca. Interest in the art of Lull was revived in the 16th and early 17th centuries and was pursued by **Giordano Bruno** and the **Herborn encyclopedists**. The young Leibniz took up this interest. Though he was critical of the vagueness of Lull’s main terms, Leibniz credited him with being a pioneer in a project that he himself hoped to take much further.

**LUTHERAN CHURCH.** *See* AUGSBURG CONFESSION.

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**MAINZ.** A city on the west bank of the Rhine, where Leibniz went in 1668 to take up a post as a judge in the High Court of Appeal given

to him by the archbishop-elect, John Philip of Schönborn. Leibniz had recently made the friendship of **Johann Christian von Boineburg**, one of the elector's ministers, who had helped him get the post and also employed him as a librarian and a legal advisor. The Court at Mainz was Catholic, and Boineburg himself had converted to Catholicism. The ethos of the Court, however, was tolerant of the Lutheran Leibniz, and he was encouraged in his ecumenical writings and writings in defense of the Christian religion. His *Confession of Nature against the Atheists* and a large number of pieces that were part of his *Catholic Demonstrations* project belong to this period.

During Leibniz's stay in Mainz he wrote an anonymous tract supporting the elector's candidate on the occasion of the election of a king of Poland. He also wrote a memorandum encouraging Louis XIV to wage war in Egypt rather than in the Netherlands. It was in pursuit of this objective that he left Mainz in 1672 to visit **Paris**, and it was also as part of a peace mission on behalf of Mainz (by this stage to end the war rather than prevent it) that he visited **London** in the following year. As things turned out, both the elector and Boineburg died while Leibniz was away from Mainz and he was never to return.

**MALEBRANCHE, NICOLAS (1638–1715).** Malebranche was born in **Paris**, educated at the Sorbonne and became a priest of the Oratorian order, which put a particular stress on the philosophical **theology** of **Augustine**. He was delighted to discover that the ideas of **René Descartes** fitted well with those of Augustine. Though too original to be styled a **Cartesian**, Malebranche did much to make Descartes's philosophy acceptable in religious circles. His *Recherche de la vérité* (Search after Truth) was published in two volumes in 1673 and 1675, while Leibniz was still in Paris. Malebranche was dissatisfied with Descartes's account of how the mind could **influence** the **body** and vice versa. He, like some of the Cartesians, adopted the view that, strictly speaking, the mind does not influence the body at all, nor vice versa, but that certain events in the mind could be the "**occasion**" for certain changes in the state of the body, and vice versa—that is, the occasion for **God** to act to bring about the changes. Leibniz's **system of preestablished harmony** was offered in his *New System* as a contribution to this controversy. Leibniz acknowledged that Malebranche and the other occasionalists were right against Descartes,

that strictly speaking the mind did not act on the body or vice versa. But Leibniz's system had the advantage, as he saw it, that it did not require him to agree with them that, strictly speaking, only God **acts**.

When Malebranche's *Traité de la nature et de la grâce* (Treatise of Nature and of Grace) was published in 1680, it provoked a storm of controversy. Malebranche held that it is in the nature of God's **perfection** to produce a thoroughly **ordered universe**. By his account, however, not only is the universe governed by laws of **nature** but God's dealings with his **creation** are themselves ordered by laws of grace. There cannot be anything arbitrary about God's grace, according to Malebranche, and the common view of God as someone whose **will** is bent or changed by prayer is to be rejected as a superstition. Leibniz took Malebranche's side in this controversy and held, accordingly, that **miracles** (which are actions of divine grace) must always conform to the laws of grace.

Malebranche had a long-running dispute with **Antoine Arnauld** about the nature of **ideas**. According to Malebranche, our ideas are in God and we **see all things in God**. Arnauld insisted, on the contrary, that all our ideas are within us. Leibniz sought to mediate in this controversy, for instance, in his *Meditations on Knowledge, Truth, and Ideas*. He thought he could give a good sense to the Malebranchian doctrine while allowing that, in a sense, our ideas are in us.

Malebranche was an extremely influential figure in his time, and Leibniz felt much closer to his philosophy than he did to the thoughts of some other major philosophers of the period, such as **Pierre Bayle** and **John Locke**. He even went so far as to tell one Malebranche sympathizer that his new system was "not so much a reversal but a continuation" of Malebranche's doctrine (GM ii 299). But, given the many details on which they disagreed, this was probably an exaggeration intended to make the Malebranchist more sympathetic to Leibniz's own system.

**MASHAM, DAMARIS (1658–1708)**. Born in Cambridge, **England**, daughter of the leading Cambridge **Platonist**, **Ralph Cudworth**, Damaris Cudworth was a close friend of **John Locke**, with whom she corresponded in the 1680s during his exile in the Netherlands. Though she married Sir Francis Masham in 1685, Locke remained a close friend and indeed went to stay with the Mashams as a paying

guest at Oates, in Essex, towards the end of his life. Lady Masham was the anonymous author of a controversial book, *A Discourse Concerning the Love of God* (1696) in which she showed her indebtedness to Locke's philosophy.

Leibniz had a short **correspondence** with Lady Masham in 1704–1705 that was prompted by her sending him a copy of her father's *True Intellectual System of the Universe*. Leibniz, knowing that Locke was staying at her house, hoped that she would show his letters to her philosophical mentor and that her responses would be guided by Locke himself. He duly offered her an exposition of his **system**, but her responses seem to have been her own. Some of her criticisms—for instance, that it was not clear why **God** needed to create **bodies** at all—show that she had an acute and independent mind. The correspondence, which petered out after Locke's death, was published by Gerhardt (GP iii 331–75) and a substantial selection is included in the translation of Woolhouse and Francks (WF 202–25).

**MATERIALISTS (MATÉRIALISTES).** Those who hold that there is nothing that is not material—and hence that, if there are **souls**, they are material. This was a view Leibniz associated with the followers of **Democritus** and **Epicurus**—and particularly, in his own time, with **Thomas Hobbes** and **John Toland**. Leibniz admitted to being more materialist in his philosophy as a young man, when he embraced a form of **atomism**. He became aware, however, that it was tempting for **Modern philosophers** to adhere exclusively to mechanical explanations and that a new defense was required of **metaphysics** and of **immaterial substances**. One of his earliest defenses was the *Confession of Nature against the Atheists*.

Leibniz suspected **John Locke** of encouraging materialism, and his *New Essays* were probably conceived, in part, as an antidote. Although Locke officially finds room for spiritual substances in his *Essay Concerning Human Understanding*, he also expressed the opinion that God might have super added thought to **matter**. Although this opinion was expressed incidentally and indeed is not easy to locate in the essay, it was seized on by Locke's critics and Locke became tarred with the materialist brush. His reputation for materialism was compounded, for Leibniz, by the defenses of his philosophy offered by Toland, whom he knew as a materialist and who presented

himself as a disciple of Locke. Leibniz's *Sense and Matter* was written, in 1702, as a corrective to Toland. He seems in that essay to assume that materialism is the metaphysics for **empiricism**.

**MATHEMATICS.** Leibniz made an intensive study of modern mathematics during his time in **Paris** (1672–1676), under the guidance of **Christiaan Huygens** and with the cooperation of **Ehrenfried Tschirnhaus**. It was during this time that he made his discovery of the **infinitesimal calculus**. Though he was recognized as an outstanding mathematician even by those who thought little of his philosophy, his mathematical work has been relatively neglected and much of the manuscript material remains unpublished.

Leibniz regarded mathematics as fundamentally similar to **logic**. The “great foundation” of mathematics, he wrote in a late letter, is the **principle of contradiction** or **identity**. The **truths** of mathematics generally, as those of **arithmetic** and geometry, were to be included among the **eternal truths**.

**MATTER.** Leibniz rejected **René Descartes**'s conception of matter as that whose **essence** is **extension**, and he rejected the **atomists**' conception that there could be indivisible units of matter. In Leibniz's **metaphysics**, matter is that aspect of a **corporeal substance**, its **body**, that is extended across **space** but is fundamentally an **aggregate of monads**. The single **soul monad**, as unifying principle for the body, is an **active force**. In relation to its soul, the matter of the body is a passive aggregate, and its constituents are subordinate monads. Although what is aggregated—that is, what is not simple—cannot be a real **substance**, insofar as matter *consists* of real substances and insofar as the aggregate itself has an organic **unity** that is represented by its soul, Leibniz calls matter a “**well-founded phenomenon**”: “Matter itself is nothing but a phenomenon—although well founded—which results from the monads” (GP iii 636: cf. L 659).

Because of the **infinite divisibility** of the **continuum**, every monad in the material body of a corporeal substance is also a soul or active force itself for a smaller piece of matter. And the monads of this smaller piece are themselves also active forces for yet smaller pieces of matter, and so on. Since this process is endless, there can be no monad that is without some active force. Therefore, the *purely*

passive, what equates to prime matter, cannot **exist** in nature. “What we . . . call primary matter is something incomplete” (*Leibniz Review* 12 [2002] 6: cf. W 486). Conversely, every monad exists, at least potentially, in a passive relation, or is subordinated in an aggregate of other monads, by some higher ruling principle. Because of the infinite augmentability of the continuum, every monad or created substance has some passive or material aspect, and only **God** is pure activity. Thus “every finite soul is embodied, not excepting even the **angels**” (GP vii 327: cf. W 65). Since matter is a mode of monads, it must coexist with them. Its **creation** could not have been subsequent to that of monads. *See also* ORGANISM.

**MATTER, PRIMARY VS. SECONDARY (MATERIA PRIMA VS. MATERIA SECUNDA).** *See* MATTER; *NATURE ITSELF, ON.*

**MECHANICAL PHILOSOPHY (PHILOSOPHIA MECHANICA/PHILOSOPHIE MÉCANIQUE).** The view, associated particularly with **René Descartes** and **Robert Boyle**, that **nature** should be understood, as the workings of a machine such as a clock are, in terms of *efficient* rather than *final causes*. Broadly, this is the view that Leibniz referred to as the **Modern philosophy**. Leibniz agreed that “all the particular phenomena” of corporeal nature could be explained **mathematically** or mechanically, but held that “the general **principles** of corporeal mechanical nature itself are **metaphysical** rather than geometrical” (*Discourse on Metaphysics*, §18). In this way he thought he could reconcile the mechanical philosophy with **immaterial substances** and with rejecting **materialism** and so reconcile the new **science** with piety. For Leibniz, nature is a “**double kingdom**” governed by two quite autonomous systems of laws—those of final causes as well as those of efficient causes—between which there is a **preestablished harmony**. Thus, he was a **vitalist** in metaphysics and a mechanist in **physics**. Leibniz did not favor the approach of those whom he called “spiritualizing authors” (such as **Henry More**, **Anne Conway**, and **Francis van Helmont**) who wanted to add in an *arché* to the world of physics and thus to be vitalists in physics. This he thought was both an encroachment on the autonomy of physics and a *deus ex machina* solution to the problem. *See* *NATURE ITSELF, ON.*

**MEDITATION ON THE COMMON NOTION OF JUSTICE (MÉDITATION SUR LA NOTION COMMUNE DE LA JUSTICE).** This 1702–1703 work is probably Leibniz’s most important writing on the theme of **justice** as the **charity** of the **wise**. In it he addresses the question posed in **Plato’s** *Euthyphro*: whether what is good and just is so because God **wills** it, or whether God wills it because it is good and just. As Leibniz understood this question, it was a choice between the view of those who said that goodness and justice are “arbitrary”—the **voluntarists** like **René Descartes** and **Thomas Hobbes**, as well as various **theologians**—or whether they belong, like “numbers and proportions,” to “the **necessary** and **eternal truths** about the nature of things” (M 41; R 45). Leibniz argues against the voluntarist view at some length before turning to his own view that justice is an **innate idea** or, in **mathematical** terminology, a “common notion”—something of which we may offer a real **definition**, that is, a definition that would state its real **essence**. Natural **jurisprudence** or “the **science** of right” is, for Leibniz, one of the sciences of eternal truth.

The *Meditation* is in two parts, which may be separate writings on the same topic. In the second part Leibniz distinguishes between different degrees of justice. The right of property is based upon what he terms “*ius strictum*,” and in this narrow sense parents may have rights over their own children and slave owners over the slaves they have bought. But, in a larger view, all **souls** have rights as members of the **City of God** that override the pretended “absolute rights” of parents or slave owners: as “rational souls” they are “naturally and inalienably free” (M 68; R 62).

The *Meditation* remained almost unknown until G. Mollat collected and edited a number of Leibniz’s unpublished writings in the philosophy of law in 1885. It is translated in R 45–64.

**MEDITATIONS ON KNOWLEDGE, TRUTH, AND IDEAS (MEDITATIONES DE COGNITIONE, VERITATE ET IDEIS).** This was the first philosophical article Leibniz published in a **journal**—the *Acta Eruditorum* of **Leipzig** included it in November 1684—and it was one he himself regarded as important and definitive, to judge from his later references to it. Leibniz distinguishes between different kinds of **knowledge**, between true and false **ideas**, and between

real and nominal **definitions**. He offers two of his criticisms of **René Descartes**: that his proof of the **existence of God**—his **ontological argument**, as it has come to be known—is incomplete since it assumes that the notion of God is free of **contradiction**; and that his appeal to **clear and distinct ideas** is ill defined and unsatisfactory. Leibniz concluded by seeking to mediate in the topical controversy between **Nicolas Malebranche** and **Antoine Arnauld** as to whether we **see all things in God**.

**MEMORY (MEMORIA/MÉMOIRE, SOUVENANCE)**. Leibniz distinguished the kind of retention that is needed for any learning from experience from the ability to recall the past to consciousness. In his discussion of the first sense of memory (*mémoire*) in the *Monadology* (§§26–28), he gives the example of the dog that remembers the pain caused previously by a stick and howls or runs away when merely shown the stick. Human and animal memory works in a similar way, he notes, with repetitions of past sequences of events leading to expectations about the future. We can learn from the past, as animals do, without using **reason**, as we do most of the time. In a quite different context, Leibniz complained that the **immortality** allowed by **Descartes**'s account of the **soul** did not allow for recollection (*souvenance*) of its previous states. Immortality without recollection, he insisted, is “completely useless to morality” because it destroys **personal identity** and therefore “upsets all reward and **punishment**” (GP iv 300; MB 128).

**METAMORPHOSIS**. *See* TRANSFORMATION OF ANIMALS.

**METAPHYSICAL CERTAINTY**. *See* CERTAINTY.

**METAPHYSICS (PRIMA PHILOSOPHIA/MÉTAPHYSIQUE)**.

The most fundamental branch of philosophy, concerned not only with the most general concepts (such as **God**, **soul**, **substance**, **accident**, and **cause**) but the most general **truths** of the **universe**. Metaphysics, or “first philosophy,” was capable, or so Leibniz thought, of both harmonizing other **sciences**, such as **physics** and **theology**, and laying their foundations. He was **optimistic** that the true metaphysics would give us sound ideas of God, substance, and cause and so give us

insight into the nature of God, substances, and causality. But he frequently deplored the unsatisfactory state of this science when compared with the **mathematical** sciences. In his programmatic paper *Reform of Metaphysics* and elsewhere, he recommends adopting the method of **geometry**.

Many of Leibniz's key metaphysical notions were already established in his relatively early *De summa rerum* of 1675–1676, though it is generally thought that the *Discourse on Metaphysics* of 1686 is the first statement of his mature metaphysics, where his theory of substance plays a pivotal role. In several short papers, such as his *Primary Truths*, his metaphysics is outlined in a form that seems to answer his own demand that a rigorous metaphysics should adopt the method of geometry. In these papers, too, Leibniz has been seen as attempting to derive his metaphysics from his **logic**. But his later presentations, such as his *New System* and *Monadology* are less formal. In his later writings Leibniz became more concerned with communicating his metaphysical ideas and, probably as a result, there are relatively few papers in the **esoteric** style that revealed his true thought to those able and willing to follow him carefully and many more papers in the relatively popular or **exoteric** style he tried to cultivate in such works as his *New Essays*.

**METEMPSYCHOSIS.** See TRANSMIGRATION OF SOULS.

**METHOD OF GEOMETRY.** See GEOMETRY, METHOD OF.

**MICROCOSM.** Philosophers writing in the tradition of **Renaissance Neoplatonism** held that everything in the **universe** is connected with everything else. Each individual in the universe (the macrocosm) reflects the universe as a whole and so is a microcosm of it. This **idea** informed some quack medicine and was attacked by the early advocates of **Modern philosophy**. Leibniz, while associating himself with the censure so far as concerned the natural **sciences**, made use of the idea of a microcosm in his **metaphysics**. In his **system**, every **substance** is a microcosm of the universe and an **expression** of both the universe as a whole and every other substance in it.

**MICROSCOPISTS.** Leibniz took a keen interest in the findings of some of the microscopists of his time, including Jan Swammerdam

(1628–1680) and Marcello Malpighi (1628–1694). When passing through the Netherlands in 1676 Leibniz took the trouble to visit and hold discussions with the microscopist and embryologist Antoni van Leeuwenhoek (1632–1723), with whom he later **corresponded**. Leibniz cited these authorities in his *New System* and elsewhere in support of his view that there is strictly neither **generation** of new **animals** nor **death** of existing ones but only **transformations** of the same animals. In his *Principles of Nature and Grace, Founded on Reason* and elsewhere, Leibniz appealed to their findings, and in particular their theory of **preformation**, in support of his own views. *See also* PREEXISTENCE; SOULS, ORIGIN OF.

**MIND AND BODY.** Leibniz did not, unlike **René Descartes**, distinguish mind and **body** as separate **substances**. Nonetheless he acknowledged that there was no way in which any true **unity** could be acted on by anything (except **God**), and it was a problem for him, therefore, as to how **created** substances could, as he put it, “**communicate**” with one another. Leibniz was thus led to address a similar problem to the mind–body problem of the **Cartesians**. His solution was to put forward a **preestablished harmony** between a **double kingdom**, with the mind being subject to the laws of **final causes** and the body to the laws of efficient causes. *See also* DUALISM; MONISM; SOUL AND BODY, UNION OF.

**MIRACLES.** Leibniz held that the events of the world conformed to perfect **order** and that, although an omnipotent **God** could intervene in an arbitrary and whimsical way, a wholly good God takes delight in **harmony**. There is no room in Leibniz’s system for “miracles” as sometimes defined (for instance, as arbitrary interventions of the deity). There are miracles, he allows, in that there are departures from laws of **nature** and so from the order of events that humans can understand. But the laws of nature are set in a context of wider laws of grace, which admit of no exception. And so miracles, as Leibniz puts it, “are in conformity with the general order” (*Discourse on Metaphysics*, §7). Leibniz was largely indebted for this account to **Nicolas Malebranche**.

Leibniz never doubted that miracles (such as men walking on water) could occur and indeed had occurred. But, in the nature of the case, they were always proof of a special divine grace. Miracles, for

Leibniz—especially prophecies, a subclass of miracles—were the basis for belief in **revelation** and so for the special claims of the Christian religion. Because of this, Leibniz tended to take the view that miracles happened as recorded in **Scripture** but, being unwilling to admit later revelations, was highly skeptical of the claims to more recent miracles that were the subject of regular gossip in religious circles.

Outside the context of special divine revelation, indeed, Leibniz tended to use the words *miracle* and *miraculous* dismissively. He was insistent on the autonomy of **physics** and rejected well-meaning attempts to introduce God into the explanation for ordinary events. He sometimes used the word *miraculous* in a pejorative sense of such *deus ex machina* explanations. He also dismissed **gravity**, as proposed by the **Newtonians**—which he thought was an **occult quality**—as merely “miraculous.”

#### **MIRROR (SPECULUM/MIROIR/SPIEGEL), THE MONAD AS A.**

The **perception** of a soul **monad** is a single representation of the **aggregate** *petites perceptions* of the monads of the **body**. These *petites perceptions* are themselves, each and individually, single representations of aggregates of yet further minute perceptions of monads that exist in other bodies both within and without the parent body. This process of representing ever more minute perceptions of smaller or more distant bodies is an unending one on account of **space** being a **continuum**; and it is in the nature of a perception to represent to some degree, however faint or confused it may appear, a collection of other monadic perceptions. Consequently each and every monad is, ultimately, a representation of every other monad in the **universe**: it is a mirror of the universe. This, however, occurs not by a real influence between monads but by a preestablished and harmonized unfolding of the perceptions of every individual monad out of its **essence**. To the extent that this essence is conceived in the mind of **God** as a **complete concept**, the result of God’s considering the interrelation of all monads, Leibniz describes each monad as “like a complete world and like a mirror of God or of the whole universe, which each one represents in its own way” (*Discourse on Metaphysics*, §9).

Since monads are considered by Leibniz to be **substances** in their own right, their internal **principles** or **appetitions** being responsible

for what perceptions they come to have, Leibniz often refers to them as “living mirrors”: “It follows that each monad is a living mirror or a mirror endowed with internal action, which expresses the universe from its own point of view” (*Principles of Nature and Grace, Founded on Reason*, §3). *See also* EXPRESSION.

**MODERN PHILOSOPHY.** The ‘new’ or ‘Modern’ philosophy usually means, in Leibniz’s writings, the philosophy according to which explanations of the world should only be given in terms of **intelligible** notions, such as those to be found in **geometry**. This philosophy was highly critical of **scholasticism**, which was still widely prevalent in European universities and seminaries. More specifically “Modern philosophy” refers to the view that the physical world should be explained in terms of **extension** and **motion**. The leading Modern philosophers, for Leibniz, included **Galileo Galilei**, **Pierre Gassendi**, and **René Descartes**.

Leibniz regarded himself as a Modern philosopher, though not without qualification. He strongly disagreed with those, for example, the **Cartesians**, who proposed to set past philosophy aside and start again. On the contrary he generally supported the revival of **ancient** philosophy. He accepted a Modern methodology for **physics**. However, he held that **matter** cannot be wholly understood in geometric terms but required also the notion of **force**, which could only be made intelligible in **metaphysics** (*New System*, §2). *See also* MECHANICAL PHILOSOPHY.

**MOMENTUM.** Leibniz’s conception of momentum, or “quantity of **motion**,” came out of his critique of **René Descartes**’s **dynamics**. **Galileo Galilei** had proposed that objects conserve their motion unless acted upon by another **force**. Descartes, in attempting to systematize Galileo’s laws, based them upon this conception of motion. The total quantity of motion of two **bodies** had to be the same after an interaction as before. But Descartes had tried to formulate this too simply. Believing that the **essence** of **matter** was **extension** alone, he sought to explain the collisions of bodies in terms of nothing but sizes and shapes, and the changes of positions with respect to **time**.

Leibniz argued, first, that Descartes ought to have distinguished motion into speed and velocity. Velocity is a vector quantity that

includes direction, whereas speed does not. Only with the velocity conception of motion could the different directions of travel of bodies be related to each other. Second, Descartes's account of body in terms of spatial extension alone could not relate the fast motion of a small body to the slow motion of a large one. The relevant attribute of bodies in collisions is their mass. The relevant "quantity of motion" or momentum is therefore the product of mass and velocity.

Although momentum is conserved in collisions between bodies on the same plane, something else is conserved, as Leibniz saw, in, for example, falling bodies—what he was to term *vis viva*.

**MONAD.** The term *monad* is a Greek word for "one." It is prominent in the writings of **Plotinus** and occurs in the works of various **Neoplatonists** such as **Giordano Bruno** and in kabbalistic writers such as **Francis Mercury van Helmont**. It has been claimed that Leibniz derived the term from one or the other of these, or from another **Platonist** such as **Henry More** or **Ralph Cudworth**. Leibniz, however, had some tendency to concoct Greek-derived neologisms ("theodicy" is the most famous example) and to use existing Greek words for his own purposes. His own use of the word monad seems to have been mostly derived from its use in Greek philosophy, particularly by **Pythagoras**. Though he must have been aware of its use by other philosophers, he presents it as if it were new to his **system**, explaining simply that the term meant "one" and never connecting his use of the term with anyone else's.

Leibniz had long required that **substances** be genuine **unities**, in principle indivisible. He began, around 1690, to use the word monad as an alternative for **substance** or true unity. Monads are conceived in Leibniz's writings as **souls** or forms and, in some cases, minds. But they are always united to a **body** of some kind, even in the case of **angels**, who need bodies to **communicate** with one another. Only **God**, according to Leibniz, is wholly without a body of any kind. God, angels, and humans are, as rational souls, at the top end of Leibniz's hierarchy of monads. At the lower end are the souls of the infinitely small creatures that constitute the physical **universe**.

In Leibniz's **monadology**, the higher monads rule over the lower ones. The relation between **mind and body** is the same as that between a unified center and the collection of monads it brings together

and governs. A composite substance such as a human being or an **animal** consists of a dominant monad and what would, if not for their connection to the dominant monad, be a mere **aggregate** of monads. The connection is a **causal** one and needs to be understood in terms of Leibniz's theory of causality, that is, the dominant monad will have more clear and distinct perceptions when it produces some "effect" on the others than do those others. *See also* CHAIN OF BEING, GREAT; CORPOREAL SUBSTANCE.

**MONADOLOGY.** A monadology is characteristically a **system** of **metaphysics** in which the One (**God**) is reflected or **expressed** by a plurality of lesser **unities** or **monads**. These monads are indivisible and were thought therefore to be the indestructible elements of the **universe**. There are a number of **principles** that form an essential part of monadologies in this sense, such as **perfection**, and other principles that are also characteristic, such as the identity of **indiscernibles**. These principles, and the philosophical tradition from which they arise, link Leibniz's monadology with earlier monadologies, such as that of **Giordano Bruno**.

The term *monadology* was not used by Leibniz himself, nor was it used by any of his predecessors. It was first given as a name to one of the most important of Leibniz's later expositions of his system—subsequently known as the *Monadology*. But this system, though it was constantly being refined, was established some years earlier. Indeed it is arguable that Leibniz already held a monadology of sorts as early as 1666. He then began, under the influence of his teacher **Erhard Weigel**, to think of the **creation** of the universe out of nothing as **analogous** to the **generation** of the number system out of 1 and 0, God being thought of in **Pythagorean** terms as "the One." Just as combinations of 1s and 0s can, in **binary-system** arithmetic, create the most complex number, so the whole complicated universe can be thought of as deriving from monads though ultimately, of course, from the One.

**MONADOLOGY.** Leibniz wrote what he described as an "elucidation concerning the **monads**" in the summer of 1714, when he was in Vienna. It was intended as a more systematic treatment of his **system** than had appeared a few years earlier, rather incidentally, in his more

popular *Theodicy*, to which there are many references. When it was published in a German translation in 1720, the editor (Heinrich Koehler) gave it the title *Monadology* and this title has not only stuck to the work but became a general way of referring to Leibniz's system. It was for some time treated as the definitive statement of Leibniz's mature philosophy but just as much weight is now given to other works, including the *Discourse on Metaphysics* and the *New System*.

The *Monadology*, like another shorter statement of Leibniz's system written around the same time—his *Principles of Nature and Grace, Founded on Reason*, is presented as a series of sections, beginning with the nature of the most basic **substances** and moving up the **chain of being**, via the **cosmological argument**, to the Creator of the Universe. From God and from his nature, the argument turns back to the world again, concluding with a discussion of the **City of God**. See image 3 for a photograph of the first page of the manuscript of the *Monadology*.

**MONISM.** René Descartes's metaphysics of **substance** was **dualist** in that he asserted that mind and **matter** exist independently of each other. Leibniz's definition of substance, as that which is without parts, results in the doctrine of **monads**. This is monistic in that mind and matter are (numerical) distinctions of only one type of substance, the monad. Mind is one monad; matter is an **aggregate** of (**infinite**) monads. Though matter is not a substance, it is not a "nothing" either; "it is a phenomenon, very real" (AG 227; GP vi 625). Every monad necessarily exists in a relation with a plurality of other monads to comprise a **corporeal substance**. Leibniz's conception of matter as an organic aggregate of monads clearly is not independent of monads, or minds, and in this respect, Leibniz should not be regarded a dualist. On the other hand, the substance of **God** is really distinguished from that of creatures. God has infinite **attributes** and is pure **activity**, while creatures have only finite **attributes** and involve a degree of passivity. Creatures are not mere modes of God, as in **Benedict de Spinoza**'s monism, because of the contingency of their **existence**. See also ORGANISM; PANTHEISM.

**MORAL CERTAINTY.** See CERTAINTY.

**MORALITY.** *See* ETHICS.

**MORE, HENRY (1614–1687).** One of the most illustrious of the Cambridge **Platonists**, More spent most of his life at Christ’s College, where he was a fellow. He was at one time an enthusiast for **René Descartes’s** philosophy and entered into correspondence with him but came to the view, expressed in his *Enchiridion metaphysicum* (1671), that **Cartesianism** was wrong in many respects, including its denial of **animal souls** and its rejection of **final causes**. More was also at one time attracted to the Christian **Kabbalah**, but here too he later became a hostile critic. Lady **Anne Conway**, whose brother was one of More’s pupils at Cambridge, was informally taught by him.

Leibniz made notes on More’s *Enchiridion ethicum* of 1668 and on a French translation of his *Immortality of the Soul* that was published in 1677 (A VI iv 1677–79). He purchased More’s *Opera omnia* as soon as it was published in 1679. Leibniz took as authoritative More’s statement of the “theses” of kabbalistic philosophy at the beginning of the latter’s *Fundamenta philosophiae*—a critique of Kabbalism More wrote for inclusion in **Knorr von Rosenroth’s** *Kabbala denudata*. There are many points of agreement between Leibniz and the Cambridge Platonists generally, as well as specifically with More, whom some scholars have thought was an influence on Leibniz’s **monadology**. But, though Leibniz himself was also, in many respects, a Platonist and a kind of **vitalist**, he would not associate himself with More’s form of vitalism, with its repudiation of the **mechanical philosophy**. He was steadfastly opposed to More’s project of trying to show that **physics** could not manage without spiritual **forces**. The “pleasant imaginings” of More—such as his “hylarchic principle”—were, for Leibniz, a kind of revival of **occult qualities**. More’s use of an **arché** to explain **natural** phenomena was inappropriate and retrograde in the context of the new physics where *deus ex machina* explanations were not allowed.

**MOTION (MOTUS/MOUVEMENT/BEWEGEN).** The motion of things is, for Leibniz, nothing more than temporal succession, or change of spatial location. Since it is a function of **space** and **time**, motion, like them, is not a real thing but a property of things: “If we

consider only what motion contains precisely and formally, that is, change of place, then motion is not something entirely real" (*Discourse on Metaphysics*, §18). Like time, change of place is continuous and so not divisible into discrete units of change or motion. There can be no jumps from absolute stasis into motion and vice versa. Consequently all things must be in a state of continuous change or **flux**, with no absolute minimal rate of change or stasis possible.

Conversely, as a **continuum**, no maximal rate of change is possible: there can be no greatest speed. "There cannot be a most rapid motion, because motion is a modification: it is the transference of a certain thing in a certain time" (A VI iii 520; Parkinson, G. H. R., ed. and trans., *G. W. Leibniz: De summa rerum*). Leibniz asserts that the motion of one thing affects, and is affected by, all other things in the **universe**. This is because the determination of the change of place, and the rate of that change, is a consequence of the accommodation of all things to each other, as they exist as **ideas** in the **infinite** mind according to a **preestablished harmony**.

In 1686 Leibniz published his *Brief Demonstration* (GM vi 117–19; L 296–301) in which he claimed that **René Descartes**'s theory of motion was false because Descartes did not distinguish between motion and velocity, and because his laws of motion ignored mass, thus contradicting the "equality of **cause** and effect." Against **Isaac Newton**, Leibniz asserted that motion was relative, since space was not absolute but only a property of things. But if motion, as a **relation**, could not be ascribed to any particular **body**, nevertheless changes of position occurred, and it had to be the property of *something*. This led Leibniz to **hypothesize** active **force** as the cause of motion.

**"MOTIVES" OF CREDIBILITY.** See CREDIBILITY, "MOTIVES" OF.

**MUSIC (MUSICA/MUSIQUE/MUSIK).** **Beauty** is, for Leibniz, the **order** or **harmony** in something by virtue of which it gives **pleasure**. The beauty of music, he claimed, "consists only of the agreement of numbers" (*Principles of Nature and Grace, Founded on Reason*, §17). Leibniz assumed that the proportions that produced a pleasant sound in music were well established. But we do not have to be con-

scious of this “agreement of number” or these “proportions” in order to enjoy music. He supposes rather a complex process that begins with the vibrations of the instrument producing the sound, includes unconscious mental processes such as counting of beats, and results in a feeling of pleasure or displeasure. Leibniz recognized that variety was important to the enjoyment of music as well as regularity. The pleasure gained from listening to a piece of music might be enhanced, for example, by the introduction of a dissonant cadence that puts the listener in suspense before harmony is finally restored. Though he does not acknowledge them, the sources of Leibniz’s theory of music go back to the **ancients**, particularly **Pythagoras**. He **corresponded** with Konrad Henfling in 1705–1709 about the foundations of music, and the exchanges between them have now been published.

**MYSTERIES (OF FAITH).** The mysteries of the Christian faith, for Leibniz, are those that cannot be comprehended by human **reason**. Among the doctrines that he regarded as above reason were those of the **Trinity**, the **Eucharist**, and the **Incarnation**. More generally the mysteries include the **miracles** reserved for **God**, such as the **Creation** and the **Resurrection**, and mysteries relating to the workings of Providence. The basis for accepting the mysteries is the **Scriptures**, and so they are a matter of **revelation**. Nonetheless there were motives of **credibility** for accepting the **truth** of the Scriptures. Mysteries are beyond the comprehension of finite minds and indeed, from the standpoint of natural reason, they are improbable. Though they are above reason, they are never contrary to it, as Leibniz explained in the long *Preliminary Dissertation* with which he prefaced his *Theodicy*. It was necessary therefore for those who accepted the mysteries to reply to objections. The mysteries would be refuted if those objections were shown to be conclusive.

Leibniz was optimistic about defending the Christian mysteries in this way. He insisted that it was not a reason for rejecting the mysteries that we cannot understand them. There are many things we accept without understanding them, he argued, for instance that colors have a basis in the objects that have them. Nonetheless he thought it would be possible to achieve some understanding of the mysteries by showing **analogies** with things with which we are at least familiar. Thus he thought the union of **soul and body** provided some analogy

for mysterious divine–human union of the Incarnation. *See also* EVIL; FAITH AND REASON; TOLAND, JOHN.

**MYSTICISM.** A mystic is someone who claims or is credited with insights into the nature of things that go beyond what can be rationally established. Leibniz was dismissive of the “false mystics” of his own time who taught that the pure **love** of **God** involved the total negation of the self, or that after **death** the **soul** lost its individuality and disappeared in the ocean of the **world soul**. He was also highly critical of the **Platonists** who had surrounded and obscured the clear teachings of their master with mystery. He did not, however, deny that there were **mysteries**, and he did on occasion refer approvingly to the “mystical philosophy” of **Plato** and **Pythagoras** (GP vii 497). In the case of Pythagoras, what Leibniz had in mind was the insight that “the deepest mysteries lie hidden in numbers” (GP vii 184; L 221). He himself took up this insight in more than one way. In his remarkable essay on the “true mystical **theology**” (Gu 410–13; L 367–69), Leibniz developed the thought that God is pure being and his creatures are compounded of being (derived entirely from God) and nothingness. The **creation** of the world from pure being and nothingness is then likened by Leibniz to the **binary system** of **arithmetic** in which all numbers are generated from 1 and 0. “On the true *Theologia mystica*” is exceptional among Leibniz’s philosophical works in being written in German. It has been suggested the work is a confession of philosophical **faith**. *See also* ENTHUSIASM; QUIETISM.

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**NATURALISTS (NATURALISTES).** Leibniz rarely used the terms *naturalism* (*naturalisme*) and *naturalist*, but when he did, he seemed to have had in mind the view (and those who held it) that an adequate explanation of the world can be given without reference to a transcendent spirit. This is how he uses the terms in a paper commonly referred to as *Two Sects of Naturalists* (A VI iv 1384–88; AG 281–84). The **Epicureans**, Leibniz claimed, denied the **existence** of anything that was not **material**, and in this they were followed in modern times by **Thomas Hobbes**. The **Stoics**, for their part, admit-

ted **immaterial substances** but denied that there was anything transcendent, and in this they were followed, as Leibniz saw it, by **Benedict de Spinoza** and possibly **René Descartes**. Leibniz was fond of a passage in **Plato's** *Phaedo* critical of Anaxagoras, which he quoted as a refutation of naturalism. He had in mind to include it in his *Discourse on Metaphysics* and actually did so in *Two Sects of Naturalists*, on the strength of which that piece is given the title, in the Akademie edition, "*Sentiments de Socrates opposé aux nouveaux Stoiciens et Epicureens.*" See also ATHEISM.

**NATURAL LAW (IUS NATURALE/DROIT NATUREL).** A branch of law that is independent of specific legal systems and is concerned with **truths** about what is right, just, and so forth that are known through **reason** alone. The tradition of natural law goes back at least as far as the ancient **Stoics** and found an influential advocate in **Thomas Aquinas**, whose approach was taken up in the 16th century by a number of priests, including **Francisco Suárez**. In the 17th century the most important figure, to whom Leibniz was indebted, was the Dutch statesman Hugo Grotius (1583–1645), whose *De jure belli ac pacis* (1620–1625) was a landmark in the development of international law. Another important predecessor of Leibniz was **Samuel Pufendorf**.

Leibniz wrote several pieces that belong in the natural law tradition, including his *Elements of Natural Law* of 1670–1671 and his *Meditation on the Common Notion of Justice*, which was written more than 30 years later. Leibniz's **jurisprudence** and theory of **justice** are influenced by the natural law tradition. In his discussion of slavery, for instance, he recognizes that, according to "the law of nations," the children of slaves are the property of their masters, and he does not dismiss outright the claim that there is a right of slavery that conforms to "natural reason." But, even if there were, he argues, there is a stronger right that outweighs it, namely, the natural and inalienable right of a "reasonable **soul**" to be free (L 572; M 69).

**NATURAL LIGHT (LUMIÈRE NATURELLE).** The "natural light" is the light of **reason**, the light by which humans are able to grasp the truths of **logic** and **mathematics** and other **necessary** or **eternal truths**. The natural light can enlighten us on the **truths** of **natural**

**religion** and so is contrasted by Leibniz with the light of **revelation**. Leibniz held that “God is the sun and light of souls” (*Discourse on Metaphysics*, §28) and that therefore the light of reason was no less divine in its source and inspiration than the light of revelation. The light of reason is, for him, an **innate idea**, and he sometimes, for that reason, refers to it as the “internal light.”

**NATURAL RELIGION (*RELIGIO NATURALIS/RELIGION NATURELLE*)**. Religion, insofar as it is based on **reason** alone and does not require an appeal to divine **revelation**, is natural religion. Leibniz acknowledged that the **mysteries** of the Christian religion were based upon revelation, but he stressed that reason was needed to identify the true marks of a revelation. Revealed theology was thus dependent on **natural theology**. Natural religion was indeed not only necessary to the true religion—as opposed, for instance, to **enthusiasm** or **fideism**—but was even sufficient for it. In his *Preliminary Dissertation*, for instance, Leibniz wrote:

Reason, far from being opposed to Christianity, serves as a basis for this religion and makes those accept Christianity who are able to examine it. But, as few people are able to do this, the heavenly gift of plain **faith** tending towards good is enough for men in general. (§52)

This statement suggests both what Leibniz’s own religion is and how he finds a place for institutional religion. It corresponds to the concluding sections of the *Discourse on Metaphysics*, where it becomes clear that Leibniz’s philosophy, as expounded, is the foundation for a natural religion in which the essence of Christianity is encapsulated. He notes that the **ancient** philosophers have little knowledge of “these important **truths**” that he has arrived at by reason. But untutored minds will not, he acknowledges, be able to follow his arguments. “Jesus Christ alone has expressed [these important truths] in such a clear way, that the most banal minds came to understand them” (*Discourse on Metaphysics*, §37). These untutored minds will need the guidance of revelation and the support of institutional religion. Those who are capable of living by natural religion, however, seem, in Leibniz’s view, to have no need of either.

**NATURAL THEOLOGY (*THEOLOGIA NATURALIS*)**. The study of matters of religion insofar as they can be determined by **reason**

alone. Contrasted with revealed **theology**, it is divided into a theoretical and a practical part, the first consisting of “real **metaphysics**” and the second of “the most perfect **ethics**” (*New Essays*, A VI vi 432). Natural theology is concerned with the **arguments for the existence of God** and with the **immortality of the soul**. It is concerned also with the **principles of justice** and the basis of virtue, which depends upon metaphysics. Natural theology thus provides a basis for **natural religion**. Leibniz also believed that natural theology provided a good basis for the Christian religion.

*NATURAL THEOLOGY OF THE CHINESE, DISCOURSE ON (DISCOURS SUR LA THÉOLOGIE NATURELLE DES CHINOIS)*. Leibniz’s interest in **Chinese** religion probably dates from his visit to Rome in 1689, when he met Claudio Grimaldi (1638–1712), who had spent 17 years in China as a Catholic missionary. Grimaldi was one of several missionaries who provided Leibniz with information about China and Chinese culture. Among the missionaries, there was a controversy about how to proceed in attempting to convert the Chinese to Christianity. One view, which eventually had the backing of Rome, was that the Chinese should be expected to abandon their cultural and philosophical heritage and accept the **truths of revelation**. The other view was that there was in the Chinese tradition something that answered to **natural theology** and that therefore they should be brought to the truths of Christianity through **reason**.

Leibniz was asked by his correspondent **Nicolas Remond** for his opinion on these issues and his response was to write this discourse in 1716. He did not complete it to his satisfaction, however, and died without sending it to Remond. The work was first published by C. Kortholt in his *Leibnitii epistolicae ad diversos* in 1735 and was also included by Louis Dutens in his major collected edition of 1768. There is now an excellent English edition with a full introduction.

There are four parts to this “discourse,” as Leibniz himself called it. The first three are concerned to show points of commonality between ancient Chinese thought and that of Christians: as to the concept of **God** and spiritual **substance**, as to the relation of spirits and **matter**, and as to the human **soul** and its **immortality**. Leibniz’s own natural theology serves as a middle term in this attempt to show that

Chinese thought is at fundamental points comparable with Christian thought. The final part is concerned with **binary-system arithmetic**. Here, as in the earlier parts, Leibniz is concerned to show that the modern Chinese had declined in comparison with the ancient Chinese, who understood many things as well as Europeans and some better than they were generally understood in Europe.

**NATURE (NATURA).** In Leibniz's writings, as in modern English, the term *nature* is used in two different (though related) ways. First, it means the totality of things apart from any gods or supernatural beings there may be. Nature (with a capital "N") is, for a **naturalist**, the totality of things; for those who believe in **God**, it is the **created** world. There is only one Nature. In the second sense of the term *nature*, however, there are many different natures. In this sense, the nature of a thing is sometimes equated with its **essence**. According to Leibniz's **metaphysics**, every individual in the **universe** has a unique nature, as no two individuals are exactly the same.

The term *Nature* is used neutrally as the object of study of natural philosophy or **physics**. And the term *laws of nature* can be used neutrally to refer to the regularities that are to be found in Nature. For the naturalist, these are not really "laws," but for the **theist**, like Leibniz, the laws of nature are regularities that express the general **will** of God. For the naturalists there are no exceptions to the laws of nature: what really is an exception to what people think is a law of nature shows they are wrong to think it so. The theist, however, allows that God can make exceptions to the laws of nature if he so chooses. As Leibniz puts it, "the nature of things . . . is no more than a custom of God from which he can exempt himself in virtue of a stronger reason" than he has for making the laws inviolate (*Discourse on Metaphysics*, §7). For the theist, these exemptions are **miracles**.

Leibniz believed that there were no departures from the general **order** and that even miracles were subject to "laws of grace." But the laws of grace, except insofar as they are revealed in **Scriptures**, are not discoverable by us. Human interest is therefore usefully directed to discovering the laws of nature. Leibniz's law of the conservation of **force** is one such law he claimed to have discovered.

Though he believed in miracles, Leibniz was critical of those philosophers who were too free in introducing them. In this spirit he criticized

the **occasionalists** for saying that there are no **causes** in nature and that what we call a “cause” is no more than the occasion for God to intervene to bring about the usual “effect.” Leibniz’s objection is that occasionalism involves a *deus ex machina*, involving what he called “perpetual miracles.” According to his system of **preestablished harmony**, on the other hand, everything arises from the nature of **individual substances** as anyone would know who has (as only God in fact has) the **complete concept** of each individual. God has established the natures of each individual substance so that when, for instance, A is said in common speech to “act on” B, there is a perfect correspondence between the ideas that arise in A and those that arise in B. But the ideas arise **spontaneously** from the individual natures of A and B and are not imposed externally by God or anyone else. The opposition between what is “natural” and what is “miraculous” thus establishes a connection between the two senses of the word *nature* in Leibniz’s thought. *See also* REVELATION.

**NATURE ITSELF, ON (DE IPSA NATURA).** In 1695 Leibniz had begun a **correspondence** with Johann Christoph Sturm, professor of **mathematics** at **Aldorf**. Sturm had propounded the **occasionalist** position that **God** was the only real source of **motion** in the world: **nature** had no energy or **force** proper to itself, and it was “pagan” to claim that the things of nature had real properties of their own. The correspondence culminated in a statement directed at Sturm, occasionalism, and others who denied a reality to the physical world. This statement was published in the *Acta Eruditorum* in 1698 with the full title *On Nature Itself; or, On the Inherent Force and Actions of Created Things, to Serve to Confirm and Illustrate the Author’s Dynamics* (AG 155–67; GP iv 504–16). This essay was Leibniz’s clearest account yet on what he believed was wrong with the doctrines of **Benedict de Spinoza**, **René Descartes**, and the occasionalists. It is also an important exposition of his fundamental philosophy of nature.

According to Leibniz, it is not the assertion of the reality of the physical world that is undesirable—“pagan,” as Sturm had called it—but its denial. **Cartesians** and occasionalists, by denying real **action** to the things of the **material** world, deny them substantiality—for what cannot act cannot be considered a **substance**. This has the

“dangerous” consequence of rendering things mere *modes* of the one divine substance: the **pantheistic** result that Spinoza had reached.

In this essay Leibniz also puts forward an important argument against the Cartesian notion of **matter** insofar as it relates to **dynamics**. That notion, that the **essence** of matter is **extension**, permits no real differentiation within the material world, with the consequence that, if there are no real parts, there cannot be any real motion or change among parts. In arguing for his own contrary position, Leibniz proposes that material **bodies** are collections of **monads**, each of which is a real substance apart from God and possesses force or **activity** insofar as the *a priori* reason for what happens in another is located in it.

This is the first published article in which Leibniz introduces the term *monad* (§12). He does so rather incidentally since he is concerned to present himself as the defender of the “received doctrine” that there are **souls** in the bodies of living things. The paper couches Leibniz’s philosophy in **scholastic** terms, as was appropriate then for a German academic readership. Arguing against Sturm’s view that all matter is essentially passive, Leibniz draws a nice distinction between primary and secondary matter. Primary matter is indeed passive, he accepts, but is not a complete substance. Secondary matter is a complete substance, but is not merely passive.

**NECESSARY TRUTHS.** Necessary truths are those, according to Leibniz, that are true in all **possible worlds** and which it would involve a **contradiction** to deny. They are contrasted with **contingent truths**, which are true of this actual world but false of one or more possible worlds. Necessary truths include not only the truths of **logic** and **arithmetic** but also those of **ethics** and **jurisprudence**. *See also* ETERNAL TRUTHS.

**NECESSITY.** *See* ABSOLUTE NECESSITY; HYPOTHETICAL NECESSITY; NECESSARY TRUTHS.

**NEOPLATONISM.** A term used by historians of ideas to refer to a **metaphysical system** that evolved out of **Plato**’s teachings but which incorporated other ideas, such as those of **Stoicism**. The first of the Neoplatonists was **Plotinus** (204/5–270), whose ideas were very influential in late antiquity partly because they were Christianized by

**Augustine.** Neoplatonism was revived in the Italian **Renaissance** by Marsilio Ficino (1433–1499) and others.

Leibniz himself did not use the term, which came into use much later; he referred instead to “the later **Platonists.**” He was highly critical of Ficino and even Plotinus for corrupting the **intelligible** philosophy of Plato and clouding it with **mysteries** and **miracles.** Leibniz supported the **Modern philosophers’** criticisms of the Neoplatonists, for instance, by his rejection of the notion of a **world soul.** Nonetheless he was deeply influenced by Neoplatonism, as is shown by his **monadology** and his use of such **ideas** as **emanation, expression, and microcosm.**

*NEW ESSAYS CONCERNING HUMAN UNDERSTANDING (NOUVEAUX ESSAIS SUR L’ENTENDEMENT HUMAIN).* Leibniz’s commentary on **John Locke’s** *Essay Concerning Human Understanding* is one of his most substantial writings. He was encouraged to write it by the interest in Locke’s philosophy shown by **Sophie-Charlotte,** queen of Prussia. He intended to offer it to Locke when it was completed, in the hope that the English philosopher would respond to it generously and engage him in a **correspondence** arising out of it. However, Locke’s death in 1704, when the work was nearly complete, discouraged Leibniz from publishing it. It was not published until R. E. Raspe’s edition of 1765, which had an important influence then on Immanuel Kant and subsequently on how Leibniz’s philosophy was received. The *New Essays* are the central feature of volume 6 of series 6 of the Akademie edition and, for ease of reference, the modern English translation of Remnant and Bennett follows the same pagination.

The *New Essays* were written as a dialogue between a disciple of Locke and a disciple of Leibniz. But although written in Leibniz’s popular **exoteric** style and apparently designed for a lay readership, it is largely without conversational moments. The main part of the work follows the order of Locke’s *Essay* with the exposition of Locke by his spokesman followed by Leibniz’s remarks on the topic. The interest of the work lies mostly in the detailed points of comparison between the two philosophers that emerges. The *New Essays* do not, and were not intended to, provide a systematic exposition of Leibniz’s philosophy. Nonetheless, in the nature of the

project, Leibniz is drawn further into some topics than he is elsewhere.

Because of the restrictions he imposed on himself by following the agenda as set by Locke's *Essay*, Leibniz is not able to provide a systematic account of his own philosophy in the *New Essays*. The preface is required to carry the burden of a general perspective. It becomes quickly evident that Leibniz saw Locke as a very different kind of philosopher from himself, rather more exoteric and closer to **Aristotle** and **Pierre Gassendi**, whereas Leibniz himself was more **esoteric** and closer to **Plato** and **René Descartes**. The view of Locke presented there and elsewhere is one that Leibniz may have acquired from following his controversy with Bishop Stillingfleet and from his own association with a professed disciple of Locke, **John Toland**. Leibniz saw Locke as inclined to **materialism** and to **skepticism** about the natural **immortality** of the **soul**. The *New Essays* may not have been conceived as, but in part turned into, a corrective to these tendencies.

**NEW METHOD FOR LEARNING AND TEACHING JURISPRUDENCE (NOVA METHODUS DISCENDAE DOCENDAEQUE JURISPRUDENTIAE)**. In 1667, shortly after completing his legal studies at **Aldorf**, Leibniz wrote this book to impress the elector of **Mainz** with whom he hoped to gain a position, as indeed he did a year later. The first part is on education in general and is of interest for its account of the psychology and philosophy of learning and of concepts such as habit and **memory**. The second part is specific to **jurisprudence**. Here Leibniz already makes use of the received distinction between the three degrees of right and **justice** that feature in his later writings in the philosophy of law.

**NEW PHYSICAL HYPOTHESIS (HYPOTHESIS PHYSICA NOVA)**.

This 1671 work was the result of Leibniz's first serious study of **physics**, and it outlines a program of new physical and cosmological **principles**. Partly on the strength of this publication, Leibniz was elected a member of the British **Royal Society**. It was published anonymously in two parts, the first of which he dedicated to the French **Académie des Sciences** and the second to the Royal Society.

Part 1, *The Theory of Abstract Motion (Theoria motus abstracti)*,

includes an extensive list of “fundamental principles” of physics. These are inspired by the ideas of **Thomas Hobbes** and **René Descartes** and anticipate some of the physical principles of Leibniz’s later work. However, the concept of **force**, crucial to his mature philosophy, is not yet present.

Part 2, *The Theory of Concrete Motion* (*Theoria motus concreti*), seeks to explain the motion of the planets about the sun, not by **gravity** but by actual mechanical interaction. Leibniz puts forward the vortex theory: that the sun and the planets exist in an ether of superfine particles. By means of physical interaction, the sun moves these particles in a vortex stream, which, in their turn, push the planets along their courses.

**NEW SYSTEM (SYSTÈME NOUVEAU).** The full title of Leibniz’s most important paper in **metaphysics** is *New System of the Nature and Communication of Substances and of the Union That Exists between the Soul and the Body* (GP iv 477–87; WF 10–20). The *New System* was the work in which Leibniz first published some of his main metaphysical ideas. These had come together in his *Discourse on Metaphysics* and developed through his **correspondence** with **Antoine Arnauld**. The *New System* was intended for the *Journal des Sçavans* and went through a number of drafts in which it changed very considerably. It was not Leibniz’s intention to offer his complete **system**, and indeed he deliberately kept back some of his more difficult or contentious thoughts, proposing (as he explained to his **Paris** friend **Simon Foucher**) to offer these at a later stage if, or as he hoped when, there had been a favorable reception to his article. Foucher agreed to write a response so that the article would not immediately be forgotten but, it was hoped, become the focus for discussion.

The *New System* appeared in two installments in successive issues of the *Journal des Sçavans* in June and July 1695. Leibniz presents his view about the “nature” of substances in the first part and, in the second, his account of the “communication” between them. The first part offers *a posteriori* arguments for several of Leibniz’s claims about the nature of substances, notably that they were **created** at once at the beginning of the world and that they are indestructible. **Animals** undergo radical changes in what we call “birth” and “**death**,” though rational souls are **miraculously** exempt from these processes.

The main conclusion of the first part is that it is in the nature of a substance to be a true **unity**. It is this conclusion that leads Leibniz into a problem about “how the body makes anything happen in the soul, or vice versa, or how one substance can communicate with another created substance.”

Leibniz’s problem is actually rather different from the **Cartesian** mind–body problem, but he allows his reader to assimilate the two. He credits **René Descartes** with seeing that the “common opinion” that mind and body **influence** one another is “inconceivable.” At the same time, he suggests that Descartes gave up the problem at this stage, leaving his followers to propose their own solution: that the mind does not influence the body, or vice versa, but when the one is said to be the “**cause**” of a change in the other, it is in reality nothing but the **occasion** on which **God** brings about the change. Leibniz had thought it **paradoxical** to say that only God strictly acts in the world and complained it involved a *deus ex machina* to bring in God to solve the problem of the communication of created substances. His own solution was to claim that each substance contains within itself all that will ever happen to it and that the apparent influence of one substance on another is due to a harmony **preestablished** by **God**.

The *New System* did not produce the response in the *Journal des Sçavans* that Leibniz hoped for. Foucher seems to have been very disappointed with it and found himself writing a largely negative reply. Leibniz had an opportunity to explain himself further but, after Foucher’s unexpected death, the exchange came to an end. Leibniz derived greater satisfaction from other correspondents, in particular **Pierre Bayle**, and was able to explain himself more fully in other **journals**. The *New System* became the best known of Leibniz’s philosophical publications with the exception of the *Theodicy*. See also MIND AND BODY; SOUL AND BODY, UNION OF.

**NEWTON, ISAAC (1642–1727)**. English **mathematician** and natural philosopher, whose *Philosophiæ naturalis principia mathematica* (1687) included his universal law of **gravity**. Newton and Leibniz are now generally thought to have arrived at the **infinitesimal calculus** independently, but they and their followers became involved in a bitter and protracted dispute about who had discovered it first. Leibniz’s reputation, particularly in **England**, suffered because of an unjusti-

fied charge of plagiarism, which was pursued by members of the **Royal Society**. The controversy was compounded by Leibniz's charges that Newtonian gravity was an "**occult quality**." Leibniz also objected to Newton's conception of absolute **space** and **time**, insinuating that it had heterodox religious implications and arguing for his own very different view that space and time are not things in themselves but **relations**. Toward the end of his life, Leibniz engaged in a confrontational **correspondence** with Newton's friend and supporter, **Samuel Clarke**.

**NIZOLIUS, MARIUS (1498–1576)**. Italian humanist who taught in Parma and authored a work called *Anti-Barbarus, seu de veris principiis et vera ratione philosophandi contra pseudophilosophos* (Against the Barbarian; or, On the True Principles and True Justification of Philosophy against the Pseudophilosophers, 1553). Leibniz was asked in 1670 by his then patron, **Johann von Boineburg**, to prepare a new edition of this work, and to this edition he wrote a lengthy preface (A VI i 398–475). Leibniz agreed with Nizolius about the "barbaric" obscurity of some of the more recent **scholastics**, including **Francisco Suárez**, whose account of **influence** he lampooned. He objected, however, to the way in which Nizolius tarred **Aristotle** with the same brush. Even the older scholastics, according to Leibniz, were not guilty of the obscurantist pseudophilosophy of which Nizolius complained. Nizolius was himself a **nominalist** but so had some of the older scholastics been. Leibniz was prompted to write at length on universals and on **induction**.

Leibniz did not refer much to Nizolius in later writings. But there is a curious echo of the *Anti-Barbarus* book in a tirade he himself wrote against the **Newtonians**. The tirade is entitled *Anti-barbarus physicus* (AG 312–20; GP vii 337–44) and it contains the criticism that the Newtonians, with their notion of **gravity**, were returning to the **occult qualities** of the scholastics.

**NOMINALISM**. The view that everything in the world is particular. It is associated with the *via moderna* of William of Occam, which Leibniz represented and endorsed as the rule that everything in the world can be explained without reference to universals or real forms. Leibniz, in his preface to an edition of a book by the **Renaissance**

humanist **Marius Nizolius**, expressed the view that the “nominalist sect” comprised “the deepest of all the **scholastics**” (GP iv 157; L 127). He himself regarded nominalism as highly appropriate for a **Modern philosopher**, though he resisted the extreme nominalism of **Thomas Hobbes**, holding that not all **definitions** were merely nominal since some stated the **essence** of the thing defined. His own moderate nominalism committed him to hold that everything that exists is particular, since ideas have no **existence** outside a mind.

**NOUVELLES DE LA RÉPUBLIQUE DES LETTRES.** A French literary and philosophical **journal** founded in Amsterdam in 1684 by **Pierre Bayle**, who was its editor until 1687. When **Henri Basnage de Beauval** took over as editor, he renamed it *Histoire des Ouvrages des Savants*. Leibniz contributed some of his criticisms of **René Descartes**’s **physics** to the journal in the mid-1680s and engaged then in an exchange with the Abbé Catelan about his *Brief Demonstration*.

**NUMBER.** See ARITHMETIC.

– O –

**OCCASION/OCCASIONALISM.** Occasionalism is the view that, strictly speaking, no **substance** except **God** acts on any other, and that what are usually called “**causes**” are no more than “occasions” for God to bring about what are popularly thought of as their “effects.” Occasionalism might be motivated **theologically** by a wish to stress the continual dependence of the **creation** on the Creator. On the other hand, it might be motivated philosophically by difficulties in giving an account of the causal **relation**. Of course, both motivations might be important, as they were in the 17th century, when occasionalism was revived in the wake of **René Descartes**’s difficulties about the relation between **mind and body**.

Descartes argued that mind and **body** were two fundamentally different substances and postulated that the two **interacted** in a mysterious manner through the pineal gland. But, as he himself saw, it was not **intelligible** how the mind could act on the body or vice versa. In the **Cartesian** account, effects can be produced on bodies only by the

movement of something extended—but the mind is not an extended thing and so cannot act on the body. Contrariwise, all bodies can do is, by their **motions**, to affect the motions of other extended things; thus the mind, not being an extended thing, is outside the influence of bodies.

Another, more general argument was that causes, as then widely understood, were supposed to contain their effects—that is, that it was impossible for a cause to occur and for its effect not to follow. But, in the ordinary way of things, there is no **contradiction** involved in saying that a cause occurred and its effect did not follow. It is only where God wills something that, since God is omnipotent, it is impossible for the cause—God’s willing something to happen—to occur and its effect not to occur. Thus God is the only “true cause.”

By these and other philosophical arguments, philosophers basically supportive of the Cartesian philosophy were led to conclude that there were no **natural** causes, strictly speaking, but that what we call causes were nothing more than occasions for God to **will** that something (ordinarily called the “effect”) to occur.

Leibniz, for reasons of his own, agreed with the negative side of occasionalism, that created substances do not strictly act on one another. In his *New System* and elsewhere, he presented his own views as a critical development from **Nicolas Malebranche**’s version of it. His objection to occasionalism was that it involved a *deus ex machina* explanation, a failure to explain natural **phenomena** in terms of natural causes. According to Leibniz’s own view, each substance contains within its own nature all that happens to it and its phenomena all arise **spontaneously** from its nature. For example, there is a correspondence or agreement between what happens in my mind and what happens in my body when I intentionally raise my arm. This is accounted for by the **preestablished harmony** between the two events. *See also* EXTENSION.

**OCCULT QUALITIES.** A standard criticism of the **scholastics** from the standpoint of **Modern philosophy** was that, instead of explaining things **intelligibly**, they postulated obscure qualities. For example, the Moderns complained, it does not explain how opium causes drowsiness merely to say that it is possessed of a “dormitive virtue.” The term *occult qualities* became part of the rhetoric of abuse in

Modern circles. Leibniz accused **Isaac Newton** of reintroducing occult qualities by the way he used the notion of **gravity**. Leibniz thought his own notion of **force** was not open to the same objection, but others, such as **George Berkeley**, thought differently. *See also* INFLUENCE; MIRACLES.

**OLDENBURG, HENRY (1618?–1677)**. A German Protestant who came to **England** as part of a diplomatic mission from Bremen and who was soon moving in **scientific** circles, associating with Samuel Hartlib, John Dury, and **Robert Boyle**. Oldenburg became the leading **correspondent** in England for Continental scientists and developed this role when he became one of the secretaries (John Wilkins was the other) of the new **Royal Society** after its foundation in 1660. Oldenburg regretted the backward state of the sciences in Germany in the wake of the Thirty Years War and was quick to encourage Leibniz, corresponding with him and becoming his main contact in England. It was Oldenburg who facilitated Leibniz's connections with the Royal Society when his young fellow countryman visited **London**. Oldenburg played a central role in the publication of Leibniz's *New Physical Hypothesis* and in providing an opportunity for Leibniz to demonstrate his **calculating machine**. Without the support of Oldenburg, it would have taken Leibniz much longer to establish himself as a scientific figure on the European stage or to become a fellow of the Royal Society, as he did in 1673.

**ONTOLOGICAL ARGUMENT**. An *a priori* form of **argument for the existence of God**, based upon the idea we have of **God** as the highest being. Leibniz knew it as an argument originating with **Anselm of Canterbury** and revived by **René Descartes** in his *Meditations*. The argument, at least in Descartes's version, turns critically on an assumption, disputed by later philosophers, that **existence** or reality is a **perfection**. If God is thought of as wholly perfect (has all the perfections to the highest degree), then God must exist.

Leibniz was sympathetic to this argument but objected that it assumed without proof that the concept of God was possible, that is, was free of **contradiction**. Leibniz at one time attempted to prove that there was no contradiction in the idea of a being possessing all the perfections and offered one version of this proof in his discussion

with **Benedict de Spinoza**. But he was later (in his *New Essays*) content to regard the argument as no more than morally **certain**, claiming that we are entitled to **presume** that a concept that is in use is free of contradiction until someone establishes the contrary.

*ON NATURE ITSELF. See NATURE ITSELF, ON.*

*ON THE ART OF COMBINATIONS (DE ARTE COMBINATORIA). See COMBINATIONS, ART OF (ARS COMBINATORIA).*

*ON THE HIGHEST OF THINGS. See DE SUMMA RERUM.*

*ON THE RADICAL ORIGINATION OF THINGS. See ORIGINATION OF THINGS, ON THE RADICAL (DE RERUM ORIGINATIONE RADICALI).*

*ON THE REFORM OF METAPHYSICS. See REFORM OF METAPHYSICS, ON THE.*

*ON THE ULTIMATE ORIGINATION OF THINGS. See ORIGINATION OF THINGS, ON THE RADICAL.*

**OPTIMISM.** A term introduced post-Leibniz to refer to the view that this is the best of all **possible worlds**. Leibniz, in common with many others up to and including his own time, took it to be an obvious consequence of **God**, the **creator** of the world, being **perfect** that the world he created is the most perfect that there could be. It appears to many, however, that the world is not like this but, on the contrary, that it is full of unnecessary **evil** and suffering. To such persons, it seems therefore that, if there is a God at all, he either does not care as much or is not as powerful as is implied by those who hold him to be perfect. The optimist does not deny that there are evils in the world, but suggests a perspective in which, though we cannot know exactly why, it is credible to suppose that they are a necessary part of the best possible world. This might be a very simplistic optimism, such as that later attributed by Voltaire in his hugely influential *Candide* to the character of Pangloss. Leibniz's optimism is, however, by no means as simplistic as that of Pangloss or, for that manner, of others who embraced optimism without much thought. It is an integral part of a difficult set of philosophical

views about the nature of perfection, of the kinds of perfection there are, and how there are conflicts between them such that some imperfections are inevitable even in the best possible world. Unlike some of his critics, Leibniz admitted **metaphysical** imperfection as well as pain and moral evil, and so the best possible world, for him, would be in a special sense the most “**harmonious**.” Leibniz’s optimism is stated and defended in his early and unpublished *Confession of a Philosopher*, in his late and best-known work *Theodicy*, and in many other writings. *See also* NATURAL RELIGION.

**ORDER** (*ORDO/ORDRE/ORDNUNG*). Leibniz held with the **Stoics** that the **universe** was fundamentally orderly. However he distinguished between those aspects of “the general order” that humans could understand (those governed by **natural laws**) and those they could not. **Miracles** are departures from the natural order, according to Leibniz, but not from the general order, from which there are no departures. Leibniz, like **Nicolas Malebranche** and perhaps those following him, frequently used the phrase “the order” to refer to “the general order.” Like Malebranche he took the general order to be an expression of **God’s** perfect **wisdom**. *See also* CONSPIRE, ALL THINGS; HARMONY.

**ORGANISM** (*ORGANISMUS/ORGANISME*). An organism or **corporeal substance** is that union in which a mass of **monads** form an **aggregate body** by virtue of being united by a single (dominant) monad, which is the **soul** and inherent teleology of the body. A collection of monads, such as a heap of stones, or a collection of corporeal substances, such as a flock of sheep, lacks a unifying principle and thus is not organic but a “mere aggregate.”

The monads subordinated in an organic body are themselves the souls or dominant monads of smaller masses of **matter**; and, because of the **infinite divisibility** of the **continuum**, organisms exist within organisms, which exist within other organisms, and so on. “The machines of nature, namely, living organisms, are still machines even in their smallest parts, *ad infinitum*.” (*Monadology*, §64). Leibniz had been interested in the idea in **Nicolas Malebranche’s** *Recherche de la vérité* that smaller and smaller creatures existed within each other, without end, and **empirical** corroboration of this seemed to come

from the work of the **microscopists** Marcello Malpighi, Jan Swammerdam, and Antoni van Leeuwenhoek. Leibniz classified organisms according to the type of dominant monad each had. Thus a bare organism, a plant, had a “mere **entelechy**,” capable only of bare **perception**; an **animal** had a “soul” with consciousness and feeling; and an intelligent creature had a “mind” and self-consciousness. Since all organisms or corporeal substances are accommodated to each other in the **preestablished harmony** of the **ideas** of all things as they exist in **God’s** mind, it follows that the whole of nature is organic. This panorganicism is expressed in metaphors like “living **mirror** of the **universe**” and “divine machine or natural automaton” (*Monadology*, §§63–64).

**ORIGIN OF SOULS/FORMS.** *See* SOULS, ORIGIN OF.

**ORIGINATION OF THINGS, ON THE RADICAL (DE RERUM ORIGINATIONE RADICALI).** Leibniz wrote this Latin paper (AG 149–55; G vii 302–8) in November 1697 and probably intended to submit it to the *Acta Eruditorum*. He never did, however, and it was not published until long after his death, in 1840 by Erdmann. It is a general exposition of his metaphysical **system** and deals with the main themes he had written about in the *Discourse on Metaphysics* and the *New System*. Much of it is to be found condensed in sections 36–48 of the *Monadology*. The *Origin of Things* is one of Leibniz’s most eloquent accounts of the **metaphysical** function of the **principle** of **sufficient reason**. In particular, he argues for the **existence** of **God** by conceiving him as the sufficient reason for the existence of the world. **Creation** is described as the application of the principle of the best of ideas of **possible worlds** as they exist in God’s mind. The world is said to be in a state of evolution toward ever greater **perfection**, a process that is without end on account of the **infinite divisibility** of the **continuum**.

– P –

**PANTHEISM.** This term was introduced by **John Toland** in the title of a book he published a few year’s after Leibniz’s death. It refers to

the doctrine that **God** is not at all transcendent to the world but is wholly immanent in it. That is, the world *is* God, and there is no real distinction between the two. The most famous pantheist doctrine in Western philosophy is **Benedict de Spinoza's**. He claimed that all things are mere modes of the one and only **substance** called God: all things flow from God in the way that the properties of a triangle flow from its concept. A number of scholars have interpreted Leibniz as inclined to pantheism, especially in his *De summa rerum*. But at least in his later writings, he believed he held a quite different view.

Leibniz's rejection of pantheism is ultimately founded on his claim that there is, **logically**, an **infinity** of other **possible worlds** that God could have created. This means that things have a contingent **existence**, unlike the necessary substance that God has. According to Leibniz, there are infinitely many created **monads**, each of which is a substance insofar as each contains the **sufficient reason** for all the **perceptions** or states it will ever have. God is not the immediate sufficient reason for the properties displayed in created things, but the sufficient reason for their existence. Furthermore, while God's substance is unlimited or **perfect** in all ways, the monadic substance is limited or imperfect. *See also* DEISM; GOD AND THE WORLD; THEISM.

**PARADOX.** As used by Leibniz, this is a dialectical term applied to what is contrary to the best authorized opinion. A "paradoxical" opinion is not necessarily false but, in this sense, should be rejected unless and until its **truth** is **demonstrated**. We are entitled to **presume** a paradox is false until it is proved true. Leibniz recognized that some of his own opinions were paradoxical and sought accordingly to show how they followed from assumptions that were beyond question. For instance, in *Discourse on Metaphysics* (§9), he introduces the **in esse principle**—which he supposes to be indisputable—and goes on to declare that "several notable paradoxes" follow from it, such as his **principle** of the identity of **indiscernibles**. Those who advanced paradoxes without providing demonstrations of what they claimed, as Leibniz once alleged **George Berkeley** did in "degrading **matter** to an illusion," were not to be taken seriously.

**PARIS.** Leibniz went to Paris on a diplomatic mission in 1672 and stayed there until 1676. This was a very important time in Leibniz's

intellectual development. He was in his element to an extent he was never to be in **Hanover**. During his stay he came to know and was influenced by a large number of **mathematicians**, **scientists**, and philosophers, including **Simon Foucher**, **Christiaan Huygens**, and **Nicolas Malebranche**. Leibniz advanced his knowledge of mathematics and **physics** during this time and produced some of his important work on the **infinitesimal calculus**. Leibniz often thought of returning to Paris and even conspired with Foucher to become a corresponding member of the **Académie des Sciences** so that he could make regular visits, but nothing came of these plans.

**PASSION** (*PASSIO/PASSION*). A term that contrasts with “**action**” in Leibniz’s philosophy. **Metaphysically** speaking, passivity is an imperfection and one of the hallmarks of creatures as distinct from **God**. *See also* PERFECTION.

**PERCEPTION**. Leibniz defined this term thus: “The transitory state which **enfolds** and represents a multiplicity in a **unity**, or in the simple **substance**, is precisely what one calls *perception*” (*Monadology*, §14). The **atomists** had explained perception in terms of physical interaction. Leibniz rejected this, as well as **René Descartes**’s theory that physical substance could somehow affect mental substance. Like **Benedict de Spinoza**, Leibniz saw the physical and mental not as two substances, but as two aspects of the same type of substance. For Leibniz, the **communication** between **mind and body** needed to be explained in terms of the **relations** between **monads** within an **order** of **final causes**. The **soul** monad of a **corporeal substance** has a perception that is a single or united representation of the “*petites perceptions*” of the many monads that constitute its **body**. The sequence of perceptions that a monad has are caused by its **appetition**, or internal **principle**, which is a **complete concept**—contains all the states that it will manifest over time—in the mind of **God**. All the states or perceptions of both the soul and the body unfold from their constituent monads according to the unfolding of their complete concepts as determined by their mutual **preestablished harmonization** in God’s mind. This is how the communication of substances and perception should be understood.

The *petites perceptions* of the body are “vivid in the **aggregate** but confused in the parts . . . the insensible parts of our sensible perception”

(*New Essays*, A VI vi 55–56). Each of these petites perceptions is itself an aggregate of yet further and more confused, more “petite” perceptions—those of bodies beyond the body, and smaller bodies within the body—and this process continues without limit, such that “each monad is a living **mirror**, or a mirror endowed with an internal **action**, and that represents the **universe** according to its point of view” (*Principles of Nature and Grace, Founded on Reason*, §3).

On account of the law of **continuity**, the extent to which a monad has clarity of perception, or represents other monads, is without an upper or lower limit: there can be no creature with absolutely confused perception, and none with absolutely clear perception. Like David Hume, Leibniz regards the quality of perception as being a **continuum** of vivacity.

Leibniz defines three categories of perception. “Conscious” perception is that possessed by the souls of **animals**, a level of clarity effected by the faculty of **memory**. “Self-conscious” perception, or **apperception**, is possessed by human beings and depends on the faculty of **reason** as well as memory. “Unconscious” perception is the category of lowest clarity and is possessed by mere **entelechies** or bare monads—those that lack memory.

Because **space** is continuous, there are no real limits in **Nature**; there are, however, limits to our perception. But perception can be extended beyond its natural limits by the microscope and the telescope, which, by gathering more petites perceptions together than our unaided eyes can manage, bring into the range of perceptibility what otherwise would be indiscernible to us.

**PERFECTION (*PERFECTIO/PERFECTION*)**. Leibniz writes about perfection in two distinct, though not unrelated, ways. He defines a “perfection” in a number of not obviously consistent ways at different times. In the *Discourse on Metaphysics*, he identifies it as a quality that has no limit nor admits of a highest degree (§1). **Knowledge**, goodness, and **power** are given as examples of perfections—indeed, the ones Leibniz attributes in their highest degree to **God**. Humans, being made in the **image of God**, have these perfections, though only to a limited degree.

Leibniz also distinguished three kinds of perfections or ways in which things can be perfect: **metaphysical** (amount of reality or

**essence**), moral (amount of goodness or virtue), and physical (amount of **pleasure** or **happiness**). The **universe**, according to Leibniz's view (later known as **optimism**), had to be the best possible, which Leibniz took to imply that it had to be as rich as possible in the diversity of **created** things (**plenitude**) as well as be governed by the simplest means (**simplicity**).

A quality, according to Leibniz, is more perfect according to the extent to which it is not limited. Hence a **substance** whose qualities are without any limitation at all is an absolutely perfect or **infinite** substance. This level of pure perfection applies only to the divine being: "where there are no bounds at all, namely in God, perfection is absolutely infinite" (*Monadology*, §41). A being that can suffer no limitation at all, if such can be conceived without **contradiction**, is, in effect, a being that must necessarily exist. This translation from essence to **existence** is Leibniz's version of **Anselm's ontological argument**. Since all the **attributes** of a perfect being are without limit, **God** must be omnipotent, omniscient, and omnibenevolent. Because created beings have their reality grounded in the necessary substance of God, Leibniz claims that the amount of perfection that **monads** have comes from God, or that they are limited expressions of his perfection. The amount of perfection a monad has is equivalent to the quantity of its **active** power or the extent to which it provides an *a priori* reason for what happens in another. Conversely, the amount of imperfection in a monad is equivalent to the quantity of passive power it has, or the extent to which it is causally determined by another. But, since no monad is entirely without some activity, there is no purely passive or absolutely imperfect thing. All creatures possess some activity, though only God is pure activity or absolutely perfect.

The principle of perfection, or principle of the best, is the **sufficient reason** for the existence of the world and the way it is, and is grounded in the perfect goodness of God's being. If God is to do what is best, he must create, and create the most perfect world that can be created. The most perfect world is conceived by Leibniz to be the one that includes the maximum possible variety and order of being, an idea of the most perfect creation that was widely accepted by **Renaissance** thinkers such as Paracelsus and **Francis Bacon**. See also BEAUTY; FITNESS, PRINCIPLE OF; HARMONY.

**PERSONAL IDENTITY.** Leibniz regarded a continuing sense of oneself as necessary for a person to be a moral being, eligible for praise and blame, reward and **punishment**, either in this life or the next. He criticized **René Descartes** because, or so Leibniz claimed, the **immortality** that was possible according to his philosophy was without personal identity and so was useless for morality. “What use, Sir, would it be to you to become King of China on condition that you forgot what you had been? Would it not come to the same thing if **God**, at the same time as he destroyed you, created a King in China?” (G iv 301; MB 128). Personal identity requires **memory** of what one has been. The continuing sense of oneself that provides a basis for their personal identity from their own point of view is *a posteriori*. God’s **knowledge** of each person, however, is *a priori*, through the **complete concept** he has of each individual **substance**. *See also* INDIVIDUATION, PRINCIPLE OF.

**PHENOMENALISM.** Leibniz takes what is nowadays called a “phenomenalist” (as opposed to realist) position on the objects of **perception**. First, in asserting that **space** and **time** are **continua**, he concludes that extended objects can neither be constituted of real parts nor endure for a moment. They are phenomena—though, insofar as they comprise a mass of **monads**, albeit one in **flux**, they are “**well-founded phenomena**.” Second, Leibniz’s theory of perception is one in which the individual perceptions emerge from *within* the perceiving **substance**, not from without by virtue of intersubstantial **communication**: “It is impossible for the **soul** or any other true substance to receive something from without” (*New System*, §14). Thus a perception is not the immediate and direct effect of an extended object.

The perception that unfolds from within the monad has a degree of clarity that is never absolute. It is always limited in extent and by detail and by being from a particular point of view. The objects of empirical **knowledge** can never acquire a reality that is any more than one of probability. Strictly, for finite minds, the existence of a plurality of substances cannot be known. In the monad “there is nothing other than this—other than perceptions and their changes” (*Monadology*, §17). The reality of things can only be established by *a priori* reason. Regarding the things of the world, this means knowledge of the infinite **causes** involved in each thing, as well as the **relations**

between all things. Such is available only to an **infinite** mind. Through *a priori* reason, we can prove the **existence** of **God** and thereby, through knowledge of his nature, we can know in general that other substances exist—something we cannot know by way of *a posteriori* perception. *See also* EXTENSION.

**PHYSICS (PHYSICA/PHYSIQUE).** In the 17th century the medieval conception of **nature** came to be replaced by the mechanistic one. In the 1630s **René Descartes** worked on establishing many of the principles of the new **science** of mechanism, but even before the end of the century, his physics was beginning to be replaced by that of **Isaac Newton**.

Much of Leibniz's contribution to physics came out of his criticism of Descartes and Newton. He complained that they both, in their own ways, offered explanations of nature that conflicted with a rational comprehension of efficient **cause** through physical interaction, which was supposed to be a key principle of the new **mechanical philosophy**. Descartes had sought to use spatial properties alone to account for the **interactions** among **bodies**, a **dynamics** that was founded on his belief that the **essence** of **matter** was **extension** alone.

In criticizing Descartes, Leibniz argued for a conception of matter that was founded on points of **force**, and he developed the notion of **momentum** and *vis viva*, the latter of which came close to the kinetic energy of later physics.

Much of Newton's physics had been postulated on the theory of **atomism** and **gravity**. Leibniz had already rejected the atom as the substantial basis of matter. In his criticism of Newtonian dynamics, he argued that transfer of motion by atomic interaction was an impossibility, as was the constitution of bodies by such elements. Gravity, he claimed, flew in the face of mechanical philosophy itself: it was a **miraculous** occult phenomenon.

In rejecting Cartesian extension and Newtonian atomism, Leibniz developed his theory of nature in which matter was constituted of dimensionless points of force, between which no real **communication** or **influence** occurred—the concept of the **monad**. All relations between things were really just properties of individual substances. **Space**, **time**, and **motion**, Leibniz argued, were mere derivatives or relations between monads, a view that was opposed to Newton's and

which was refined in his **correspondence** with the Newtonian disciple **Samuel Clarke**. See also *NEW PHYSICAL HYPOTHESIS; SPECIMEN OF DYNAMICS*.

**PLASTIC NATURES.** See CUDWORTH, RALPH; *VITAL PRINCIPLES AND PLASTIC NATURES, THOUGHTS ON*.

**PLATO (c. 428–347 B.C.).** Greek philosopher and follower of Socrates, whose thought Plato claimed to expound in dialogue form. Plato inherited a number of his doctrines from **Pythagoras**, including the **immortality** of the **soul**. His philosophy was in many respects congenial to religion and much of his thought was absorbed into Christian **theology**, for instance, by **Augustine**.

Leibniz became familiar with Plato's writings at an early age. When he was in **Paris**, he produced Latin abridgements of the *Phaedo* and the *Theaetetus*, apparently for the use of the dauphin. He encouraged his friend **Simon Foucher**, though without success, to produce a collection of texts from Plato in French. He himself, always modest about his French, introduced a short extract in translation from the *Phaedo* into his *Two Sects of Naturalists*.

Leibniz's regard for Plato was probably greater than for any other philosopher. He referred to the Greek as "the greatest of the idealists," that is, those opposed to **materialism**. He accepted a Christianized version of the theory of forms in which the eternal **ideas** exist in **God's** mind. Plato also strongly influenced Leibniz's key doctrines of **innate ideas** and **eternal truths**. Moreover, a cornerstone of his **metaphysics** is the Platonic thought that the true beings of which the **universe** is ultimately constituted are real **unities**. Were Plato's philosophy to be stated rigorously and systematically, he told one **correspondent**, it would "come quite close" to his own (GP iii 637; L 659). See also NEOPLATONISM; PLATONISTS.

**PLATONISTS.** Leibniz tended to admire the ancient Platonists but to be critical of those later followers of **Plato** whom we would nowadays call "**Neoplatonists**," from **Plotinus** to such **Renaissance** figures as the Florentine Marsilio Ficino (1433–1499) and some of Leibniz's own contemporaries such as **Henry More**. Leibniz commended the insight of the ancient Platonists (the **skeptics** of the an-

cient Platonic academy) that the **existence of intelligible** things is incomparably more certain than the existence of sensible things. He thought Plato himself was clear and not to be blamed for the obscurities into which some of his later followers, such as Ficino, were led.

Leibniz objected to the doctrine of a **world soul** subscribed to by a number of later Platonists and would not join them in their opposition to the **mechanical philosophy**. Nonetheless he was led to place himself, in contrast with **John Locke**, as more of a Platonist. His opposition to philosophical sects inhibited him from claiming, as he might have done, to be a **Modern** Platonist. Still, when he claimed that anyone who would make Plato's philosophy into a **system** would be performing a valuable service, it seems clear it was a project close to his own heart.

**PLEASURE (LAETITIA, VOLUPTAS/LUST).** Leibniz's philosophical psychology is broadly hedonist in that he regards it as a fact of human nature that people seek pleasure and indeed that—with qualifications—the good for humans lies in pleasure. “Man inclines toward pleasant things as a stone falls towards the center [of the Earth]” (Gr 487). But passing pleasures can lead to lasting misery. **Reason** bids us, therefore, to look for lasting pleasure or **happiness**. “An intelligent being's pleasure,” he wrote, “consists in the perception of **beauty, order, and perfection**” (GP vii 290; P 146). Leibniz included among the pleasures of intelligent beings what they gain from listening to **music** or doing **scientific** research. The highest pleasure of all for humans in this life is the tranquility they can achieve through reflecting on and deriving pleasure from the **harmony** and beauty of the world. Even the **beatific vision** is an enhanced form of this pleasure.

Leibniz's hedonism seems in some respects to be at variance with other parts of his philosophy, for the pursuit of pleasure and the pursuit of perfection are apparently different and even opposed. Leibniz, however, sought to identify the two pursuits, at least for beings who act rationally. In a paper on **wisdom**, unusually written in German, he defined pleasure as “the sense of a perfection or an excellence, either in ourselves or in something else” (GP vii 86; L 425). Among the perfections in ourselves from which we derive pleasure, Leibniz notes, are physical fitness and “great freedom of power and action”:

“happiness, pleasure, **love**, perfection, being, power, freedom, order, and beauty are all connected to one another” (GP vii 87; L 426).

It is these interconnections that allow a Leibnizian speculation on why God, who has no need of anything outside himself, should have chosen freely to **create** the world. The answer has to be that he created the world for his own pleasure in the perfection of his creation.

**PLENITUDE.** The view that a **perfect** world is one that would be as full as possible is one that Leibniz inherited from the **Neoplatonists**, in particular from **Plotinus**. The **harmony** of the **universe** requires both **simplicity** or **order**, on the one hand, and multiplicity or variety on the other. Plenitude is thus a key feature of a perfect world and becomes a leading idea in Leibniz’s **metaphysics**.

On the basis of the **principle** of plenitude, Leibniz denies the possibility of a **vacuum** and insists that the universe is a **plenum**. On this basis too, Leibniz derived his principle of the identity of **indiscernibles**, that is, that there are no two things in the world that differ only numerically, since duplication would detract from the richness of the world. The principle of plenitude also provides an underpinning for his acceptance of the idea of a great **chain of being** and his perception of a **vacuum among forms** as a kind of imperfection. *See also* ANGELS; ANIMALS.

**PLENUM.** There was considerable debate among 17th-century philosophers as to whether there were empty spaces or **vacua** in **nature**, as was claimed by the **atomists**, or whether nature was completely filled with matter or, in other words, was a plenum, as **René Descartes** and others held. The young Leibniz was for a while undecided as to which side to take in this dispute, but he came to reject atoms and the void as inconsistent with his fundamental principles, those of the identity of **indiscernibles**, **perfection**, **plenitude**, and **sufficient reason**. His view that nature is a plenum, however, is not the same as Descartes’s, since his later view is that nature is filled not with matter but with **monads**. Since nature is a plenum, everything in it is connected with everything else and each monad is a **mirror** in which every other is represented. *See also* CONSPIRE, ALL THINGS; INFINITE DIVISIBILITY; UNIVERSE.

**PLOTINUS (205–270).** Born in Egypt, Plotinus studied for about two decades at Alexandria. In 244 he moved to Rome, where he taught until 268 and where his thinking developed. His writings, which covered all the major branches of philosophy except politics, were edited after his death by his disciple Porphyry, who entitled them the *Enneads*. Plotinus took the revived “Middle **Platonism**” and combined it with the doctrines of **Pythagoras**, **Aristotle**, and **Stoicism** to produce a **system** sympathetic to the religious demands of his time. His central teaching was that of the three hypostases: the One, Nous, and **Soul**. Plotinus’s philosophy inaugurated what was later known as **Neoplatonism**.

Leibniz claimed to have read Plotinus as a boy, at the same time he first read **Plato**. He would certainly have learned more about him as a student at **Leipzig** from his teachers **Jakob Thomasius** and Johann Scherzer. Less directly he would have encountered aspects of Plotinus’s teachings through the various traditions that arose out of the **Renaissance** revival of Neoplatonism, such as the German Neoplatonic tradition, Cambridge Platonism, and the Christian **Kabbalah**. Leibniz had an ambivalent reaction to Plotinus, as he did to Neoplatonism in general. While many Neoplatonic conceptions can be found in Leibniz’s philosophy, he is critical of the school’s handling of Plato’s doctrine, accusing it of both obscurantism—at times actually taking Platonic metaphors literally—and of often overlooking Plato’s most important points.

**PLURALITY OF WORLDS (PLURALITÉ DES MONDES).** The controversy about whether there are other worlds that harbor life, perhaps intelligent life, is one that goes back to the **ancients**. But throughout the early Christian era and through the Middle Ages, religious beliefs about the uniqueness of humans and a geocentric model of the **universe** combined to rule out the **existence** of other worlds. It was argued in the 13th century that it was within **God**’s power to **create** other worlds but generally agreed that he chose not to do so. With the advent of Copernican astronomy, however, doubt was cast on whether the Earth was unique and speculation reopened about other worlds and the possibility of life on them. Those contributing to the debate included **Giordano Bruno**, **Johannes Kepler**, Cyrano

de Bergerac, and, in Leibniz's own time, **Christiaan Huygens** and **Bernard de Fontenelle**.

There is little doubt that Leibniz took part in speculations about such matters and that he himself was entirely open to the plurality of worlds. The conversation in his *New Essays* occasionally turns to it. In one passage (A VI vi 472), Leibniz has his disciple briefly review some of the literature on the subject, including the books by Kepler, Huygens, and Fontenelle. Theophilus speculates not only that in some other world there may be species intermediate between humans and **animals** but also that "in all probability, there are rational animals somewhere that are superior to ourselves." Leibniz's **principle of plenitude**, his acceptance of the great **chain of being**, and the general principle that everywhere the foundations of things are **analogous** give him such an *a priori* commitment to the plurality of worlds that it would be an **empirical** difficulty for his philosophy if it turned out that the Earth was entirely anomalous. *See also* POSSIBLE WORLDS.

**POLITICAL PHILOSOPHY.** Leibniz, perhaps because of his position as a courtier, wrote no systematic work of political philosophy as such. Nonetheless it is clear that he supported neither absolute and "arbitrary" monarchies like that of Louis XIV nor constitutional monarchies wherein the sovereign was constrained by some kind of social contract. Leibniz was certainly a monarchist but his ideal monarchy was the **City of God** and his preference may have been for an elected monarchy, where the sovereign was chosen for qualities such as **wisdom** and **justice**. "The end of monarchy," he wrote to his British correspondent **Thomas Burnett**, "is to make a hero of eminent wisdom and let virtue reign" (GP iii 277). He made it clear that he thought the British had done this with William III, who was "far removed from arbitrary power."

Leibniz's political philosophy is idealistic. He clearly expected a great deal of monarchs in setting **God** as their role model—perhaps too much for his ideas to be threatening. He may have been too closely involved in, and compromised by, the **Hanover** dynasty, for whose cause he worked tirelessly.

**POSSIBLES, STRIVING.** *See* STRIVING POSSIBLES.

**POSSIBLE WORLDS (*MONDES POSSIBLES*).** The term *world* is sometimes used to refer to the Earth and—if there are any—other systems like it. In that sense, there could be, and was in the 17th century, a debate about the **plurality of worlds**. But the term is also used to refer to the actual **universe** in its entirety. In that second sense, in which there is only one actual world, Leibniz spoke of “possible worlds,” worlds that **God** *might* have **created** but of which he chose to create only this one.

A possible world is any world the constituents of which are compossible or form a set of thoughts that are internally consistent, that is, not conflicting with the **principle of contradiction**. God produces **infinite** thoughts of possible things in his mind, which are deduced from the **eternal truths** according to rational principles. These thoughts are combined into infinite arrangements and infinite sequences. Every such compossible arrangement is a possible universe, and there is an **infinity** of these, in each of which every thought of a thing is a possible **substance**. Since, by the principle of contradiction, there can only be one actual world, it is the notion that there is a multiplicity of possible worlds that makes the actual world a contingent one. Without the plurality of possible worlds there would be no need for creation or a Creator. God chose this one world from among the possible ones by virtue of his goodness, and hence Leibniz claimed that this world is the best of all possible ones. *See also* OPTIMISM.

**POWER (*POTESTAS/POTENTIA*).** **Benedict de Spinoza** claimed that the meaning of **God** exercising his power was that of certain effects following from his **essence**; hence, the power of God refers to the **causal** nature of his essence. According to Leibniz “there is in God *Power*, which is the source of all” (*Monadology*, §48), but he disagreed with Spinoza that the power of things is also the power of God, for though God exists necessarily, he produces things freely. This is because more than one **possible world** could, conceivably, have been created, and the **sufficient reason** for this actual world lies in God’s essence of goodness. The power that creatures, created things, have is produced by God, but it differs from his. The power of God creates; the power of creatures moves. God’s being is necessary, so his power is unlimited; created beings are contingent, so their power is limited.

The power of a creature is commensurate with the extent to which it is the *a priori* reason for what happens in something else.

**PRAEDICATUM INEST SUBJECTO.** See *INESSE PRINCIPLE*.

**PREESTABLISHED HARMONY (HARMONIA PRAESTIBILIA/L'HARMONIE PRÉÉTABLIE).** Leibniz agreed with the **occasionalists** that it was impossible, strictly speaking, for **substances** to **interact** or **influence** one another. He proposed, in his *Discourse on Metaphysics* (1686) and in later writings, that what really happens should be understood in terms of separate stories about each substance involved. Thus, when substance A appears to have an effect on substance B, things happen in each of A and B that arise **spontaneously** out of their separate natures. **God** not only created each substance with the nature it has but also created the world of substances with the intention that their phenomena would correspond harmoniously in the way they do. Leibniz initially referred to this way of explaining apparent intersubstance interaction as the “way of correspondence,” “the hypothesis of agreements,” or “the hypothesis of concomitance” and did not adopt the phrase “preestablished harmony” until some way into the exchanges arising from the publication of his *New System* (1695).

Leibniz confused a number of his critics by his preference for calling his **system** “the system of preestablished harmony,” for an occasionalist could—and **Nicolas Malebranche** did—also embrace a system of preestablished harmony in which both the laws of grace and the laws of **nature** by which events unfold are set up at the beginning of **time**. It is the spontaneity of individual created **substances**—who are therefore true **causes** on Leibniz’s view—and not the preestablished harmony as such that marks out Leibniz’s system as distinct from the occasionalism of Malebranche.

**PREEXISTENCE (PRAEEXISTENTIA/PRÉEXISTANCE).** Leibniz held that all **souls**, including **animal** souls, were indestructible and could only come into being through **creation** or go out of existence by **annihilation**. Animal souls all came into existence, according to Leibniz, at the beginning of things and so all animals now alive have preexisted, though they have often been **transformed**. In the case of human souls, Leibniz found a “middle way” between a cre-

ation and “an entire preexistence.” The soul preexisted “in the **seeds**” from the beginning of time as a merely sentient being but was raised to the higher status of a rational being when the human to whom this soul would belong was conceived (*Theodicy*, §397). This solution was one he labeled **transcreation**. *See also* PREFORMATION; SOULS, ORIGIN OF.

**PREFACE TO AN EDITION OF NIZOLIUS (1670).** *See* NIZOLIUS, MARIUS (1498–1576).

**PREFORMATION (PRAEFORMATIO/PRÉFORMATION).** The theory that **animals** exist before birth in a contracted state in the sperm as animalcules (“little animals”) and that their birth is simply a stage in their augmentation. Versions of this theory were advocated by some of the early modern **atomists**, such as Daniel Sennert (1572–1637) and **Pierre Gassendi**. Though the theory is now discredited, it had gained quite widespread acceptance in Leibniz’s time, supported as it seemed to him by the observations of the **microscopists** Marcello Malpighi and Antoni van Leeuwenhoek.

Leibniz himself was attracted by the theory, which fit nicely with a number of his own views about the origin of **souls** and their **preexistence**, as well as with his insistence that souls always have **bodies** of some kind. He alluded to the theory in his *New System* and gave it prominence in his *Principles of Nature and Grace, Founded on Reason*. In this latter work he announces: “Modern research has taught us, and **reason** confirms, that the living beings whose organs are known to us—i.e., plants and animals—do not come from putrefaction or chaos, as the **ancients** thought, but from *performed seeds*, and hence from the **transformation** of preexisting living beings” (§6). *See also* GENERATION.

**PRELIMINARY DISSERTATION ON THE CONFORMITY OF FAITH WITH REASON (DISCOURS PRÉLIMINAIRE SUR LA CONFORMITÉ DE LA FOI AVEC LA RAISON).** Published as part of his *Theodicy*, this essay is Leibniz’s best statement of his position on **faith and reason**, that **faith** is above **reason** but not contrary to it. Here, and elsewhere, Leibniz opposed himself both to those like **John Toland** who sought to reduce religion to what was

wholly **rational** and those, like **Pierre Bayle**, who opposed reason and faith and held that faith depended entirely on **revelation**. Faith, according to Leibniz, always has its motives of **credibility** and so acceptance of the **truths** revealed in **Scripture** is not blind. Leibniz compares faith with experience, since “faith (as far as concerns the reasons on which it is based) depends on the experience of those who have seen the **miracles** on which revelation is founded, and upon the trustworthiness of the tradition that has handed them down to us” (*Preliminary Dissertation*, §1).

Though the Christian **mysteries** are improbable, from a rational point of view, and cannot be **demonstrated**, it is possible, or so Leibniz thought, to refute those who say they are *impossible*. Though we cannot hope to comprehend the mysteries, we can have “an **analogical** understanding” of them such as the union of the **soul and body** offers us of the union of **Creator** and creature in the **Incarnation** (§§54–55). To the extent that it can find appropriate analogies, it is possible for reason to go some way toward making the mysteries credible.

**PRESUMPTION** (*PRESUMPTIO/PRESOMPTION*). A term used in legal argumentation to indicate where the onus of proof lies. The familiar sense is where someone is presumed innocent until proved guilty. Leibniz, himself a lawyer, makes use of this term where **demonstrative** arguments are not available—holding, for instance, that we are entitled to presume that a concept is free of **contradiction**, that is, that the onus of proof lies with those who hold that there is a contradiction to show where it lies. He argues, for instance, that there is no need for a demonstration that the concept of **God** does not involve a contradiction. It is something that may be presumed. Thus he later thought the **ontological argument** could be defended against the criticism he himself had formerly made of **René Descartes**’s version of it. The **certainty** of the conclusion, however, would then be reduced to that of practical or “moral” certainty. In this way the appeal to presumptions provides a way of resolving disputes and is not a substitute for full demonstrations.

**PRIMARY MATTER.** See MATTER; *NATURE ITSELF, ON*.

**PRIMARY TRUTHS** (*PRIMAE VERITATES*). A primary or first **truth** is one that cannot and does not itself need to be **demonstrated**

and can be put forward as a basis on which other truths can be established. The **principles of contradiction** and of **sufficient reason** are commonly put forward by Leibniz as primary truths. In various contexts he allows other primary truths, such as “Something exists,” “I think, therefore I am,” and “Various things are thought by me.” See also AXIOM; COGITO; PRIMARY TRUTHS.

**PRIMARY TRUTHS (PRIMAE VERITATES).** The title commonly given by editors to one of the most important of the short statements of Leibniz’s philosophical **system** (AG 30–34). The title of this work from around 1686 is derived from the opening words, which explain the starting point of the work in **primary truths**. The interest of the work is that, perhaps more than any other, it presents many of Leibniz’s characteristic doctrines as deductions from primary truths such as the **principle of contradiction**. It is, in that sense, one of his most **rationalistic** works in which **truths of metaphysics** are presented as following from truths of **logic**. In the Akademie edition it is called, quite appropriately, *Principia logico-metaphysica* (A VI iv 1643–48). The work was not published until Louis Couturat included it in his important collection of previously unedited Leibniz writings in 1903.

**PRINCIPIA LOGICO-METAPHYSICA.** See PRIMARY TRUTHS.

**PRINCIPLE (PRINCIPIUM/PRINCIPE).** A principle is an **axiom** that is assumed in a **system** of philosophy. Among the fundamental principles of Leibniz’s philosophy were the principles of **contradiction** and **sufficient reason** as well as, at least for a while, the *inesse principle*. Other important principles include those of **continuity** and **perfection**. Leibniz thought it important to establish “fixed principles” so far as was possible by deriving them from more fundamental principles that are taken as **primary truths**.

**PRINCIPLES OF NATURE AND GRACE, FOUNDED ON REASON (PRINCIPES DE LA NATURE ET DE LA GRÂCE, FONDÉS EN RAISON).** This short statement of his philosophy (AG 207–13; GP vi 598–606) was written by Leibniz in 1714, when he was looking for ways of making it more widely known and

accepted. It was written during a visit to Vienna, around the same time as his *Monadology*, of which it may be an early draft. The work was probably written at the request of Prince **Eugene of Savoy**, who received it as part of a presentation set of Leibniz's papers. But was also sent to his correspondent **Nicolas Remond**, who may have circulated it in his **Paris** circle.

As its title suggest, the piece divides into two parts. In the first part, Leibniz is concerned with questions about what he calls "**physics**," expounding his main doctrines about the nature of **monads**, the origin of **souls**, and how **animals** undergo successive **transformations**. The transition to the second part is made via a **cosmological argument** for the **existence** of **God** and is concerned with the **harmony** between the **double kingdoms** of **nature** and of **grace** and the special place of humans in the divine scheme of things.

**PROBABILITY (PROBABILITAS/PROBABILITÉ).** Leibniz recognized quite early on that **logic** should not be confined to **demonstration**, as it had traditionally been, but that a "new logic" was needed in order to know degrees of probability in matters of fact. This new logic would have all sorts of practical applications, from legal, insurance, and other business matters to games of chance and from making judgments about historical events to the interpretation of texts. He gave an account of the place of a logic of probability in "practical philosophy" in a letter to **Thomas Burnett** of 1697 (GP iii 193–94), but he did not develop his thoughts on this topic in a systematic way.

**PROTOGAEA.** Leibniz developed an interest in paleontology during the time he was involved in mining projects in the Harz mountains, when his curiosity was aroused by the discovery of fossil remains in the rocks. In the early 1680s, when Leibniz had been asked to write a history of the House of **Hanover**, he was diverted into preparing what might have served as a preface on natural history. The result was his *Protogaea*—subtitled "A dissertation on the first formation of the globe and its oldest traces of history in the very monuments of nature." A summary of the *Protogaea* was published in the *Acta Eru-ditorum* in 1693 but the work itself did not appear until 1749.

The *Protogaea* is a geological history of the Earth. Leibniz's theory was that the Earth must originally have been molten and its hard

surface formed by cooling. There were many upheavals affecting the surface, including great floods, as was evidenced not only by its appearance but by the existence of the fossils of sea creatures on mountains. Though the *Protogaea* is not itself a philosophical work, it is of interest in the context of the **metaphysical** theories Leibniz was developing in the 1680s.

**PUFENDORF, SAMUEL (1632–1694).** German jurist, historian, and philosopher of international law. Pufendorf studied theology at **Leipzig** before going to **Jena**, where **Erhard Weigel** encouraged his interest in Hugo Grotius, **Thomas Hobbes**, and **René Descartes**. He became a tutor to the sons of a Swedish diplomat and, due to hostilities, was imprisoned in Denmark, during which time he meditated on international law. On his release Pufendorf published his *Elementa jurisprudentiae universalis* (Elements of Universal Jurisprudence, 1661). A new chair of the law of **nature** and nations was created for him at Heidelberg, but he later returned to Sweden, teaching at the University of Lund before becoming historiographer royal. The king of Sweden made him a baron a year before he died.

In 1672 Pufendorf published his *De jure naturae et gentium* (Concerning the Law of Nature and of Nations), and in 1675 he produced a shortened version entitled *De officio hominis et civis* (On the Duty of Man and the Citizen). In this work, inspired by Hobbes, he embraced a form of what is now called “legal positivism,” defining “duty” in terms of what is prescribed by the law and “law” in terms of what is commanded by the superior. Leibniz was asked to give an opinion of the book’s suitability for the instruction of the young and, in 1706, wrote a highly critical review of it. This review was included as an appendix by Jean Barbeyrac in the fourth (1718) edition of his French translation of Pufendorf’s work and translated into English by Patrick Riley in 1972 (R 64–75).

Leibniz objected that, if Hobbes and Pufendorf were right, no one would have a duty unless there were a superior to require its observance. For Leibniz, by contrast, the duties of **natural law** are **eternal truths**. Natural law is not subject to the will of any superior, not even **God**. Leibniz’s conclusion was that while Pufendorf’s book was not without merit, it was lacking in sound **principles**.

**PUNISHMENT (POENA/CHÂTIMENT/STRAFE).** Leibniz was familiar with the three grounds on which philosophers and others wishing to justify the practice say people may be subjected to punishment. Two of these grounds do not presuppose **free will** on the part of the wrongdoer. The first of these is that the purpose of punishment is to reform the wrongdoer, and there were those Leibniz knew—including **Francis Mercury van Helmont**—who subscribed to this view of divine punishment, which was known at the time as the “medicinal” view. The second view that does not presuppose free will is that the point of punishing people is to deter them or others from wrongdoing in the future. Leibniz did not regard either of these views as sufficient. He agreed with those who held that punishment was needed in order to give retribution or “satisfaction” for a crime.

In his “observations” on William King’s book *On the Origin of Evil*, which he appended to his *Theodicy*, Leibniz took the opportunity to clarify his position. “True retributive justice,” he wrote, “assumes . . . intelligence and freedom in the sinner, because the **harmony** of things demands satisfaction or **evil** in the form of suffering, to make the mind feel its error after the voluntary **active** evil to which it has consented” (GP vi 417; H 423). King had criticized the view that the **will** is prompted by the judgment of the understanding, which Leibniz recognized as his own, as involving a denial of free will and therefore as precluding a retributive view of punishment. Leibniz took some pains, accordingly, to reject King’s view of free will and to insist that he could and did embrace both free will and a retributive view of punishment. *See also* ETHICS; JUSTICE.

**PYTHAGORAS (c. 580–c. 500 B.C.).** An ancient Greek philosopher, **mathematician**, and religious thinker. Pythagoras left his native Samos and founded a society in southern Italy that later flourished in various parts of Greece itself. He was reputed to have taught an **exoteric** doctrine to please the people but also an **esoteric** doctrine he revealed only to his disciples. Pythagoras was a major influence on **Plato**, on whose writings posterity has been largely dependent for knowledge of Pythagoras’s thought. Plato accepted his view of the **immortality** of the **soul**, the religious dimension of philosophy, and the mathematical basis of the **universe**. These ideas were prominent in **Neoplatonism**.

Leibniz saw Pythagoras as an early opponent of **materialism**, not only because of his argument for the immortality of the soul (taken up by Plato) but also for his belief that the universe was the effect of a universal intelligence. He referred frequently to Pythagoras's doctrine of the **transmigration of souls**, though sometimes suggested that there was a different doctrine taught to his inner circle. Leibniz praised Pythagoras for his **mystical theology** and claimed to be able to preserve in his own **system** the truth there was in "the reduction of everything to **harmonies** or numbers, ideas and perceptions by the Pythagoreans and the **Platonists**" (GP iv 523; L 496).

– Q –

**QUIETISM.** A **mystical** doctrine according to which the **soul** should seek to achieve a state of tranquility by surrendering its desires and purposes to the **will** of **God**. A renewed controversy about quietism resulted from the publication in 1675 of Miguel de Molonos's *Spiritual Guide*. The quietists were suspected both of **fatalism** and of denying the individuality of souls by suggesting that they are absorbed into the divinity after the **death** of the living **body**. Archbishop François Fénelon caused a stir in 1697 when he put forward a quietist view of the true **love** of God—which required the soul to be truly disinterested and self-denying, setting aside even the personal interest in salvation. Fénelon's controversy with **Jacques-Bénigne Bossuet** resulted in his being condemned both by the French king and the pope. Leibniz strongly opposed the tendency to quietism that he thought he detected in some of his contemporaries. Some of his objections are given in his paper *Reflections on the Doctrine of a Single Universal Spirit* of 1702 (GP vi 529–38; L 554–60). *See also* WORLD SOUL.

– R –

**RADICAL ORIGINATION OF THINGS, ON THE.** *See* ORIGINATION OF THINGS, ON THE RADICAL.

**RATIONALISM.** What is referred to as “rationalism” in relation to philosophers such as Leibniz is the doctrine that metaphysical **knowledge** is only attainable by **reason**, that is, by deduction and intuited self-evident **truths**, and that all things can, at least in principle, be known in this way. Leibniz is traditionally ranked, along with **René Descartes** and **Benedict de Spinoza**, as one of the rationalists. Descartes and Spinoza responded to the philosophical thirst for **certainty** of their time with rationalist doctrines. Leibniz’s response is more complicated. His youthful project of a **universal science** was certainly a rationalist program: the truths of contingent propositions were to be demonstrated by the **analytical** reduction of their concepts to simple self-evident truths in the manner of the “**geometrical method**” of **logic** and **mathematics**.

From the early 1680s, however, Leibniz thought that though this could be achieved for **abstract** concepts, the **infinite** antecedents involved in contingent concepts render their **demonstrability** by this method a literally endless process—one achievable only by an infinite mind. From this time on, therefore, he accepted that certain knowledge by reason alone was unattainable by the finite mind; the only knowledge humanity could acquire was **empirical**, which is merely probabilistic. He did not abolish the rationalist conception of certain knowledge regarding contingent things, but he restricted this knowledge to the divine mind, which, as infinite, is able to calculate the infinite antecedents of contingent propositions. This dual epistemology allows him to maintain that the **universe** is essentially rational—and ordered along rational lines—and to formulate the concepts of **metaphysics** in terms of a divine rationalism. He does this, for example, when he claims that an individual **substance** has a **complete concept** from which all the predicates of that substance can be deduced. *See also* **INESSE PRINCIPLE**.

**REASON.** The *faculty* of reason refers to the capacity for abstraction or conceptual thinking, the **analysis** and comparison of concepts, **induction** and deduction, and the conceiving of universals. One such generalization is that of a **unity** that is maintained through a diverse multiplicity, that is, **substance**. The **idea** and **truth** of this concept, Leibniz notes, is apparent to self-conscious creatures as the “I.” From the concept of substance, reason produces the ideas of **attribute**, **per-**

**ception, force, causality**, and necessity—in short, the key concepts of **metaphysics**. Thus, only those creatures, such as human beings, that have **apperception** or self-consciousness are capable of accessing the “**necessary and eternal truths** of reason.” (“It is thus that in thinking of ourselves we think of being, of substance, of the simple and compound, of the immaterial, and of **God** himself” [*Monadology*, §30].)

Leibniz notes that *a* reason is commonly conceived as “a known truth whose connection with some less well-known truth leads us to give our assent to the latter.” But an *a priori* reason is one which “especially and *par excellence* . . . is the cause not only of our judgment but also of the truth itself” (*New Essays*, A VI vi 475). Such an *a priori* or **sufficient reason** is what provides the truth of propositions and the reality of facts. In the case of the necessary truths of **logic, mathematics**, and metaphysics, this sufficient reason is the principle of **contradiction**. In the case of **contingent truths**, the sufficient reason of the principle of **perfection** is additionally needed. But since only an infinite mind could know the **infinity** of final **causes** involved in a contingent proposition, human reason cannot know *a priori* truths of fact. **Science** can proceed empirically; the principle of sufficient reason remains a mere definition of what factual truth should be.

Leibniz regarded the faculty of reason as a divine gift bestowed on human beings but not on other **animals**. It was the mark of **souls** fit for the **City of God**. Since he held that all souls existed from the **creation**, it was necessary for him to explain how rational souls came about. His theory was that they were not there at the beginning but came about when God gave reason to an animal soul, by a process he calls **transcreation**, raising its status and making it worthy of a special place in God’s providence. *See also* DEMONSTRATION.

**REFORM OF METAPHYSICS, ON THE (DE PRIMAE PHILOSOPHIAE EMENDATIONE)**. A short programmatic paper Leibniz wrote for the *Acta Eruditorum* in early 1694, whose full title is *On the Reform of Metaphysics and the Concept of Substance* (GP iv 468–70; L 432–33). From the time he was a young man, Leibniz had been interested in the reform of **metaphysics**. Early on, he professed to be a follower of the *philosophia reformata* (or sometimes “*emendata*”), then another way of referring to **Modern**

**philosophy.** In the 1670s and 1680s he wrote, though he did not publish, programmatic pieces on the improvement of metaphysics by introducing the methods of the **mathematical** sciences, especially the method of **geometry**.

In this short article, he begins by lamenting the poor state of metaphysics when compared with the exact **sciences**. He recommends a more rigorous method in which, following the example of **Euclid**, the subject would proceed by clear **definitions** and full **demonstrations**. He goes on to suggest that his own definition of **substance** would make possible the derivation of many important **truths** “about **God** and minds and the nature of **bodies**,” but he does not go further except to refer to his new science of **dynamics**, his concept of **force**, and their implications for a proper understanding of substances.

The paper was probably intended to be a foretaste to be followed up later if there was a satisfactory response. This was true of the slightly different version of the paper Leibniz produced in French, apparently intending that it should be included in the *Journal des Sçavans*. His purpose had been “to test the water” and to add his meditations on the **communication of substances**—his *New System*—later if his paper on “the advancement of true metaphysics” went down well with “the public” (WF 33). He sent it to **Jacques-Bénigne Bossuet**, asking him to submit it on his behalf, but Bossuet apparently did nothing with it and it was not published until it was included in the *Correspondance de Bossuet* in 1909.

**REINCARNATION.** See TRANSMIGRATION OF SOULS.

**RELATIONS.** According to Leibniz’s *in esse principle*, the predicate of any true statement is contained in its subject term. And, according to his related **metaphysics**, all there are in the world are **substances**, and everything that is true of them is contained in their **complete concept**. These doctrines, and his related doctrine that there are no purely **extrinsic denominations**, have the consequence that relations are not a fundamental feature of the world but are at best **well-founded phenomena**.

Relations, though well founded, were what Leibniz termed *semi-mental*. One example he used, in a letter to **Samuel Clarke**, was that of the relations between members of a family in a genealogical tree,

where the same **soul** might change by “the fiction of a metempsychosis” from being a son, to being a father, a grandfather, and so on, depending on where it was in the tree (AG 338–39; GP vii 401). The implication of the **analogy** of a soul entering a new **body**, as in metempsychosis, is that, for Leibniz, changes in relationships—though they reflect **truths** about the individuals—do not fundamentally change them. The genealogical relations are only “ideal things.”

Leibniz’s theories of **space** and **time**, are among the most important philosophical applications of his doctrine of the ideality of relations.

**REMARKS ON WACHTER’S “ELUCIDARIUS CABALISTICUS”**  
(*ANIMADVERSIONES AD JOHANN GEORG WACHTER*). See  
WACHTER’S “ELUCIDARIUS CABALISTICUS,” *REMARKS ON*.

**REMOND, NICOLAS.** A French courtier of noted culture who became chief councilor to the Duke of Orleans. Remond’s interest in **Plato** and sympathy for **Nicolas Malebranche** encouraged Leibniz to look to him as an ally in philosophical matters. His letters to Remond (1713–1716) are more confiding than are those to **correspondents** with whom he had little in common, and these letters contain much of philosophical interest (GP iii 603–78; selections in L 654–60). He wrote his *Monadology* for Remond and sent him a copy of his *Principles of Nature and Grace, Founded on Reason*, probably hoping his correspondent would help to disseminate his ideas in **Paris**.

**RENAISSANCE.** The term *Renaissance* is used by historians to refer to a period of cultural and intellectual history. The period varies from country to country, and there was considerable regional variation also. For Italy and France, the Renaissance extended from the middle of the 14th century to the end of the 16th century, but in Germany its influence is marked much later and, arguably, Leibniz can be considered, in some respects, a Renaissance philosopher just as, in others, he is a **scholastic** or a **Modern** philosopher.

Renaissance philosophy was profoundly influenced by the revival of **ancient** learning, especially that of the ancient Greeks and Romans. The resurgence of **Plato** and the translation of his texts into Latin encouraged a revival of **Platonism** or what is usually called **Neoplatonism**. There was similarly a great interest in the revival of

**Stoic** philosophy and new forms of Stoicism emerged. There was an interest also in ancient cultures of the Middle East from which, it was thought, Greek philosophy was derived. One view that found favor was that there was a *prisca theologia* that derived from Moses and was taken up by **Pythagoras** and Plato. A number of Renaissance thinkers combined Neoplatonism with an interest in the **Kabbalah**.

There are several features of Leibniz's philosophy that make it appropriate to consider him as a Renaissance philosopher and mark him out as quite different from his great Modern contemporaries such as **Nicolas Malebranche** and **John Locke**. One is his veneration for the ancients and his habit of citing their support as confirmation of the views he himself was putting forward. Another is his support for **resuscitating** ancient philosophy by publishing the texts of the ancients in modern translation. A third feature is his **eclecticism**. But qualifications need to be made in each case that suggest Leibniz occupies more of a transitional position. His citation of the ancients is for views he has his own reasons for holding and is offered partly to block the charge of **innovation**. The texts of the ancients were to be selected so that they would be relevant to contemporary philosophy. And Leibniz's eclecticism, as he presents it in his later philosophy, seems already to presuppose his own **system**, which provides the perspective within which the truth in the teachings of the various **sects** can be seen.

**REPUBLIC OF MINDS.** *See* CITY OF GOD.

**RESURRECTION.** A Judeo-Christian doctrine that, when people die, they are raised again in a **bodily** form. The Christian belief is referred to the claimed **miraculous** reappearance of Jesus to some of his disciples after his **death**, still bearing the marks on his body of his crucifixion. On this basis Christians believe that, at some stage—the Last Judgment, it is usually claimed—everyone will be resurrected in what is in some sense the “same” body. Since it is commonplace that bodies decay after death, the doctrine was long considered among the most difficult to believe of all the articles of the Christian **faith**.

In a memorandum he wrote for Duke **Johann Friedrich** in 1671, Leibniz outlined his theory of how resurrection was possible and so not wholly unbelievable. He suggested that every **substance** had an **essence** that was so subtle that it would survive in the ashes even if

the substance were consumed by fire. The essence or **seed** was contracted but not destroyed by the death of the body and could therefore grow and come to life again in another form. There was in **nature**, therefore, an **analogue** for the resurrection. Thus, although belief in the resurrection was a matter of faith, it was not entirely unreasonable.

Leibniz later gave up some of the commitment to **alchemy** that this defense involved, but he continued to hold that nature provided an analogue of the resurrection and that therefore belief in it was not unreasonable. In writings such as the *New System* he claimed that there was neither **generation** nor death among **animals** but only **transformations** of animals that survived. He claimed the support of some of the leading **microscopists** of his day for this theory.

#### **RESUSCITATORS** (*RESUSCITATOIRES/RESSUCITATEURS*).

One feature of Leibniz's philosophy—unusual for a **Modern philosopher** and in marked contrast with **René Descartes**—was the value he attached to **ancient** philosophy. When charged by **Antoine Arnauld** with the religiously suspect practice of “**innovation**,” he could reply quite truthfully that, on the contrary, “I usually find that the most ancient and generally received opinions are the best” (GP ii 20–21). He himself was keen to encourage the revival of ancient philosophy, especially where it was of use in resisting some of the trends of more recent philosophy. This he did rather in the spirit of **Renaissance** humanism and in accord with the **eclecticism** of his own philosophy. In his relatively early preface to an edition of a work by the Renaissance humanist **Marius Nizolius**, Leibniz contrasted “those who draw from the springs of **Aristotle** rather than the cistern of the **scholastics**” (A VI ii 413; L 127). He praised **Pierre Gassendi** for reviving the **atomism** of **Democritus** and **Epicurus**. When his friend **Simon Foucher** sent him his book on the **wisdom** of the ancients in 1686, Leibniz responded with enthusiasm, writing, “I have long known that they are much more skillful than our moderns think and it is desirable that they are better known” (GP i 380). Other philosophers had successfully revived the **Stoics** and Epicurus. There was even a collection of what was known of the philosophy of **Pythagoras**. What was needed was to make selections from the ancients of what was most suitable for present circumstances.

Leibniz was particularly keen to encourage Foucher to produce selections from **Plato**, who had been served badly (in Leibniz's opinion) by those like Marsilio Ficino and other **Platonists** who had distorted their master's teachings. He had himself translated the passage from the *Phaedo* where Socrates offered criticisms of philosophers who were too inclined to **materialism** that Leibniz thought were still very pertinent in his own time. He incorporated this passage into his *Two Sects of Naturalists* in a way that exemplifies how he thought the teachings of the ancients should be used. He sometimes paid Descartes the backhanded compliment—backhanded because it detracted from the Frenchman's much-vaunted originality—of suggesting that his major achievement was to restore the study of Plato (GP iv 468; L 432). *See also* ACADEMIC SKEPTICISM.

**REUNION OF CHURCHES.** *See* CHURCH UNITY.

**REVELATION (REVELATIO/RÉVÉLATION).** The Judeo-Christian **God** is, like most deities, "hidden," and it was sometimes claimed (though not by Leibniz) that there could be no **knowledge** of God except insofar as he chose to reveal himself. The Christian religion claims to derive from a special revelation of God through his **Incarnation** in Jesus Christ as narrated in the New Testament. A revelation might be accepted, in part or in whole, on **faith**. But acceptance of it was rational, according to Leibniz, where it had what theologians had called "motives of **credibility**." The evidence for the **truth** of the New Testament consists of **miracles**, especially the kind of miracle that is involved in prophecy. It is thus based on evidence that is to be evaluated historically—testimony as to what happened and what was said, the transmission of that testimony, and so on. Leibniz believed (or at least professed to believe) that this evidence stood up to critical examination.

At the same time, Leibniz did not like the exclusive emphasis on revelation—what he referred to dismissively as "pure revelation"—of some theologians who wished to reject the claims of **natural religion**. He believed, on the contrary, that it was essential to provide a rational defense of the Christian religion and sometimes implied or even stated that revelation was necessary only because people did not make sufficient use of their **reason**. Certainly there are texts (especially the *Discourse on Metaphysics*) that imply that there are two

routes to the fundamental truths of Christianity. But there are other texts where Leibniz seems to acknowledge that revelation was the only source of knowledge of the Christian **mysteries**, such as the Incarnation and the **Eucharist**. For instance, in a letter to **Johann Friedrich** of 1671, he wrote:

In revealed theology I undertake to demonstrate, against the insults of infidels and atheists, not indeed the truth of mysteries (since that comes from revelation), but their possibility; so as to defend them from all charges of being contradictory. (A II i 163)

It is not clear, however, how important these mysteries were to Leibniz personally, as opposed to Leibniz the churchman. So it may be that those passages that appear to attach weight to the mysteries and therefore to revelation are less important. *See also* DEISM; ENTHUSIASM.

**RHEINFELS, ERNST VON HESSEN.** *See* ERNST VON HESSEN RHEINFELS.

**ROBERVAL, GILLES PERSONNE DE (1602–1675).** French **mathematician**, professor at the Collège de France, and founding member of the **Académie des Sciences**. Leibniz knew Roberval when he was in **Paris** and discussed **René Descartes**'s geometry with him. Later on in life, Roberval presented his project of **demonstrating** the **axioms** of **Euclid** and, though members of the Académie scoffed at it, Leibniz thought differently. When Roberval died, without having published his planned *Elements of Geometry* in which his project was to be carried out, Leibniz and his friend **Ehrenfried von Tschirnhaus** sought out the manuscript but did nothing with it. Nonetheless Leibniz believed this kind of project—the attempt to discover demonstrations of accepted axioms—was “one of the most important points of the art of **discovery**” (GP vii 165; W 35). *See also* GEOMETRY, METHOD OF.

**ROSICRUCIANISM.** This movement had its origin in 17th-century Germany and was based on a supposed religious society founded in 1484 by Christian Rosenkreuz. Its aim was to effect spiritual regeneration and political reform through ecumenical means. Its theologico-philosophical teaching was a Protestant version of **Renaissance Neoplatonism**, and it drew heavily on **alchemy**, **mysticism**, and occultism.

Leibniz's first position after leaving the university was as secretary to a society in Nuremberg. It has often been claimed that this was a secret society of Rosicrucians. However, the only direct evidence of Leibniz's involvement with this society—that of his secretary and first biographer, Professor Johann Georg Eckhart—suggests that the members of this society were primarily interested in chemical experiments (to find the philosopher's stone), and that Leibniz's duties were the recording of such experiments and making extracts from the writings of famous chemists. Although some members of this society may have belonged to splinter groups of Rosicrucianism, the movement was, in general, concerned with the mystical and symbolic side of alchemy and more or less opposed to the search for the philosopher's stone through chemistry.

Leibniz's direct references to Rosicrucianism are skeptical and, at times, hostile. He thought that **Francis van Helmont** was a Rosicrucian, though the latter denied it.

**ROYAL ACADEMY OF SCIENCES (FRANCE).** See ACADÉMIE DES SCIENCES.

**ROYAL SOCIETY.** The Royal Society of London was established in 1660 and given a royal charter in 1662. Its full title was the Royal Society of London for Improving Natural Knowledge. Among the founder fellows who had connections with Leibniz or were of particular interest to him were **Robert Boyle**, Robert Hooke, Sir Robert Moray, **Henry Oldenburg**, Dr. John Pell, John Wallis, and John Wilkins. Leibniz met Boyle, Hooke, Moray, Oldenburg, and Pell during his first visit to **London** in 1673, when he demonstrated his **calculating machine** and gave the fellows some account of his plans for a universal language. He met John Collins, a fellow since 1667, on his short second visit in 1676. Leibniz had dedicated his *New Physical Hypothesis* to the Royal Society and he contributed to its *Transactions*. He was made a fellow shortly after his first visit.

Leibniz's fellow-countryman Oldenburg had done much to smooth his way but even he had not succeeded in protecting him from the hostility of some of the fellows. After Oldenburg's death there was no one at the Royal Society to defend his cause, and Leibniz found himself accused of having plagiarized the **infinitesimal calculus** from

**Isaac Newton.** This accusation found its way into the *Philosophical Transactions* of the society in 1711. Leibniz wrote, appealing to be treated justly, and the Royal Society set up a committee to look at the evidence and to publish a report, together with the relevant documents. A *Commercium epistolicum* appeared in 1713 in which the charge of plagiarism was upheld. The dispute dragged on until Leibniz's death and soured his reputation among English **mathematicians** for some time afterward.

– S –

**SCHOLASTICISM.** *Scholastic philosophy* is the term used for the style of philosophy in academic institutions from the 14th century through to the 17th, when it was challenged by **Modern philosophy**. It was characterized, at least by its critics, by an excessive deference to **Aristotle** and an overemphasis on rote learning and formal disputations rather than independent thought. This is, of course, a stereotype. Many philosophers classified as scholastics were far from slavish in their adherence to Aristotle, and scholasticism, especially in the 16th and 17th centuries, was much more flexible and varied than the stereotype would lead one to expect. Leibniz's **eclectic** teacher at **Leipzig, Jakob Thomasius**, is a case in point. Leibniz himself—to judge from his own account—went through a scholastic phase, as he explained to a correspondent in 1678:

I did in fact read them [i.e., the scholastics], more immoderately and eagerly than my teachers approved, when I began to study philosophy in academic institutions. They were afraid, indeed, that I would cling too tightly to these rocks. At that time you would have found me making some original and profound comments (for so they seemed to others as well) on the **principle of individuation**, the composition of the **continuum**, and the **concurrence of God**. And I have never since regretted having tasted these studies. (A II i 401; L 190)

Leibniz's undergraduate dissertation had been on the principle of individuation. Some of his early work on the composition of the continuum has probably been lost, but the problem comes up in his **correspondence** with Thomasius and in his *New Physical Hypothesis*. His interest was stimulated by a number of contemporary writers, and

there are quite early references to a scholastic work on the topic by Libert Fromond to which he frequently referred in later writings—*Labyrinthus, sive de compositio continui* (1631). Not much remains of Leibniz’s early thoughts about the concurrence of God, but this too remained an important problem for him and, in his *Theodicy*, he shows his awareness of the scholastic theological literature on the topic.

Even though Leibniz soon became a Modern philosopher and could be very critical of the scholastics—for instance, in his preface to the edition of a book by **Marius Nizolius**—he thought they had made important contributions to subjects that concerned him in philosophy, ranging from the origin of forms to the principles of **justice** (see *New Essays*, A VI vi 431). In some matters, such as **occult qualities**, Leibniz followed the rhetoric of Modern philosophers. In others, as with **substantial forms**, he thought other Moderns had been too quick to dismiss the insights of their predecessors. He likened sifting through the works of the scholastics to panning for gold, acknowledging a good deal of dross but insisting that there was real gold to be found. He praised those he called “the deeper scholastics,” among whom he included **Francisco Suárez**, for their substantial discussions of topics like the continuum, the principle of individuation, the origin of forms, and **God’s** concurrence with **created** things. See also LABYRINTH.

**SCIENCE (SCIENTIA/SCIENCE).** Leibniz uses the term *sciences* to refer as we do to the particular sciences, which for him included not only astronomy, **physics**, and **mathematics** but also **ethics**, **natural law**, and **metaphysics**. But these count as sciences in any sense only because they aspire to *scientia* or **knowledge** in a strict sense. According to Leibniz, “Science is certain knowledge of true propositions” (GP vii 43), but he acknowledged that we could rarely have intuitive knowledge outside **logic** and mathematics and that, in **empirical** matters, we often had to be content with moral **certainty**.

**SCIENCE, GENERAL (SCIENTIA GENERALIS).** See SCIENCE, UNIVERSAL.

**SCIENCE, UNIVERSAL (SCIENTIA UNIVERSALIS).** In 1663 Leibniz read the **Herborn “encyclopedists”** Johann Alsted and Jo-

hann Bisterfeld, whose works inspired him to read the *Ars magna* of **Ramon Lull**. This work, along with **Thomas Hobbes**'s proclamation that all reasoning was calculation, led Leibniz to conceive of his universal science. This required, first, the development of a **universal characteristic**, or vocabulary of signs, which would represent simple concepts in a systematic fashion. Second, a set of formal rules, or a calculus, had to be devised for combining these simple concepts into complex ones. This done, it would then be possible to deduce the logical consequences of any proposition, or complex of propositions, that belonged to any of the particular **sciences**. The idea of a universal characteristic had been commonplace in the 17th century, but the development of a calculus for purely formal deduction was original with Leibniz.

Leibniz had been influenced by **Augustine**'s claim that, in order to know a **truth**, one must be able to show that it can be deduced in the same way that we deduce **mathematical** truths. That is, by the substitution of identical terms, a complex proposition must be reducible to a statement of **identity**—such statements being taken to be self-evident truths by virtue of the **principle** of **contradiction**. Such a substitution of terms is now known as Leibniz's Law. In his youthful *Dissertation on the Art of **Combination*** (1666), Leibniz took his first steps in showing how simple concepts could be combined into complex propositions by mathematical **logic**. His interest in universal science was a lifelong passion. It inspired the essays *Elements of a Calculus* (1679) and *A Study in the Calculus of Real Addition* (1690) and was a motivation that led to his inventing a **calculating machine** and establishing academic societies. His invention of a mathematical system for reasoning makes him a father of symbolic logic, nearly 200 years before George Boole had to reinvent many of Leibniz's unpublished achievements.

**SCRIPTURE** (*SCRIPTURA*). Sacred writings that are a **revelation** from **God** of religious **truths**. Leibniz thought that the **mysteries** of the Christian religion could only be known through revelation. The authority of the Scriptures was to be accepted on **faith**, but there were motives of **credibility** on which this acceptance was rationally founded. Leibniz thought that the rational basis was history that established the truth of certain **miracles**, in particular of prophecies.

**SECRET (ARCANUM).** A “secret” is a **mystery** that can be unraveled and explained. Some mysteries, such as mysteries of **faith**, remain beyond human understanding. But **nature**, as Leibniz thought of it, is full of secrets that could be discovered but for which it was necessary to have the right key. He also used the metaphor of a **labyrinth** for which it was necessary to have the “Ariadne’s thread” that would lead one out. Shortly after he had written his *Discourse on Metaphysics*—the first statement of his mature **metaphysics**—he wrote a piece called *A Specimen of Discoveries about Marvellous Secrets of Nature in General* (A VI iv 1615–26; P 75–86). This work, unlike the *Discourse*, outlines Leibniz’s system in a **demonstrative** manner, starting with **primary truths** and seeking to resolve a number of key mysteries such as the cause of **evil**, the nature of an individual **substance**, and the union of **soul and body**.

**SECTS.** Philosophical “sects” are groups of philosophers who are loyal to a particular leader or set of ideas. The word *sect* was already a term of abuse in Leibniz’s time. He was scathing about **Aristotelians** and **Cartesians** who consulted the writings of their master rather than think for themselves. On this point, he was at one with the new scientific academies. The **Académie des Sciences** in **Paris**, for instance, would not admit Aristotelians or Cartesians as members. Leibniz claimed sectarianism to be entirely inappropriate in philosophy and a major obstacle to its progress. It might be thought that there was some hypocrisy in this and that Leibniz too would have liked to attract a following of loyal disciples. He was evidently more than pleased at the success of his *New System*, limited though it was. At the same time, he did not preen himself on his originality in philosophy and, on the contrary, went out of his way to find points of agreement in the writings of others and to acknowledge where points had been made before, especially by the **ancients**. *See also* ECLECTICISM; INNOVATOR.

**SEED (SEMEN/SEMENCE).** Leibniz’s view that **monads** or created substances cannot act on one another has the implication that they are not naturally destructible. This in turn led him to conclude that they could only come into being by **God’s creation** and only go out of being if he chose to **annihilate** them. He thus came to hold that **genera-**

**tion** is “merely the growth of a changed and developed **animal**” and **death** of the same animal is nothing but its “diminution” (GP vi 533; L 556–57). Leibniz therefore favored the view, which he thought was confirmed by the observations of the **microscopists** and supported by their theories of **transformation**, that “seminal animals or living seeds have existed since the beginning of time.” This view accords well, he claims, with the Bible—he seems to have had in mind the beginning of Genesis—which he understood to say that “there were seeds in the beginning” (GP vi 534; L 557). *See also* PREFORMATION.

**“SEEING ALL THINGS IN GOD” (“VOYONS TOUT EN DIEU”).**

The view that we see all things in **God** is particularly associated in Leibniz’s time with **Nicolas Malebranche**, whose defense of it provoked scornful refutations from other philosophers such as **Antoine Arnauld** and **John Locke**. Malebranche understood the doctrine to entail that our **ideas** themselves are in God and took himself to have drawn it from the Christian **Platonism** of **Augustine**. Leibniz, like Arnauld, held that our ideas are “in us” and, in his first public contribution to the debate—his *Meditations on Knowledge, Truth, and Ideas*—he largely comes down on Arnauld’s side, alluding only in parenthesis to Malebranche’s being “an old opinion which, properly understood, is not entirely to be despised.” In private **correspondence**, however, Leibniz was much more positive about Malebranche’s controversial doctrine. Leibniz had written to Malebranche in 1679: “I heartily approve these two claims that you make: namely, that we see all things in God, and that **bodies** do not strictly act on us” (GP i 328; L 209). The two propositions are indeed connected, since, for Leibniz as for Malebranche, the only external **cause** acting on each **created substance** is God himself. It follows from this not only that God is the source of all our **knowledge** but also that he is the “immediate external object” of our **souls**.

There are two sustained discussions of this topic in Leibniz’s later writings, both written in response to critiques of Malebranche. One is a paper (E 450–52; W 497–503) he wrote in response to one of Locke’s posthumously published works, *An Examination of Père Malebranche’s Opinion of Seeing All Things in God* (1706). The second is in a letter written in 1715 to **Nicolas Remond**, where Leibniz is replying to a “refutation” by Rudolfe du Tertre. De Tertre had

complained that Malebranche's work was "rather infected" by the language and opinions of the Platonists. To this, Leibniz retorted that it was, on the contrary, "enriched" by them. Leibniz concludes this discussion in these terms:

It is good to remember that, not only in Father Malebranche's **system**, but also in mine, God is the immediate external object of souls and he alone exercises a real **influence** on them . . . all our **perfections** are a continual gift from God and a creaturely participation in his **infinite** perfection. This is sufficient to conclude that even what is good and true in our knowledge is an **emanation** from the light of God, and that in this sense we can say that we see things in God. (GP iii 660; MB 116)

***SENSE AND MATTER, LETTER ON WHAT IS INDEPENDENT OF (LETTRE TOUCHANT CE QUI EST INDEPENDANT DES SENS ET DE LA MATIÈRE)***. A letter written by Leibniz for Queen **Sophie-Charlotte** of Prussia in 1702 (AG 186–92; GP vi 499–508). It is one of his contributions to a debate the queen encouraged between Leibniz and **John Toland**, an outspoken **materialist** and defender of the **empiricism** of **John Locke**. Leibniz argues, as he did later in his *New Essays*, that it is necessary to qualify the empiricist claim that there is nothing in the understanding that was not previously in the senses, by making an exception of the understanding itself and its concepts—**substance**, **cause**, effect, being, **truth**, and so on. The understanding also includes truths of reasoning or **necessary truths**, such as those of **logic** and **mathematics**, which are known by what was referred to as the "**natural light**." The senses, he concludes, cannot teach us absolutely universal truths. That there must be something other than **matter** follows, he goes on to argue, from the fact that matter does not contain the reason for its **existence** within itself. The reason for the existence of the material world must lie in something outside it, which, since all things are connected, must be the "ultimate reason for things"—in short, **God**. Leibniz goes on to allow that, while all **created** things are material, no created substance is *merely* material and that **souls** or something **analogous** to them are to be found throughout **nature**. *See also* INDUCTION.

**SENSES.** See EMPIRICISM; *SENSE AND MATTER, LETTER ON WHAT IS INDEPENDENT OF.*

**SEPARATED SOULS (ANIMAE SEPARATAE).** It was a doctrine of **Thomas Aquinas** that when humans died, their **souls** were separated from their **bodies** and remained in this state of separation—known as “the intermediate state”—until the time of the general **Resurrection**, when all souls would be reunited with their bodies. Although Leibniz—particularly in his ecumenical writings such as the *Examination of the Christian Religion*—sometimes writes as if he was willing to embrace this doctrine, it is inconsistent with a fundamental tenet of his own philosophy: that all created souls have bodies. Leibniz did not strictly accept the **Platonic** or **Cartesian** view of the afterlife as involving the preservation of a purely mental **substance**. His belief in the **immortality** of the soul required, rather, a theory of the resurrection in which what was in some sense the same body was preserved.

He could, of course, give a good sense to the Thomist doctrine by construing the “separation” as a detaching of the soul from the *gross body* rather than all forms of body. And perhaps that was why he could appear sympathetic to the doctrine of separated souls. But, in some of his later writings, where he was no longer concerned with the sensibilities of Catholic **theologians**, he was openly dismissive of the doctrine. In his *New Essays*, for instance, he is quite scathing about the **scholastics** who claim that “**God** exalts fire to the point where it is able, without any intermediary, to burn spirits separated from bodies” (A VI vi 68) and blames them for undermining belief in an afterlife by embroidering it so as to make it ridiculous. More positively he affirmed that it was easier to believe in **immaterial substances** “when it stops being a question of substance separated from **matter**” (ibid.).

**SIMPLICITY.** Leibniz held that the **perfection** of **God’s** conduct in relation to the world is shown by the world’s **plenitude**, that is, by the richness and abundance of the effects achieved in it, combined with the simplicity or economy of the means by which that abundance is achieved. The “simplicity” of God’s ways is linked by Leibniz to the

law-likeness or **harmony** of the **universe**. In the early paragraphs of his *Discourse on Metaphysics*, one of the best statements of his commitment to these notions, Leibniz goes so far as to claim that even **miracles** are not exceptions to the orderliness of the universe. They too conform to the general **order**, to laws of grace. At this point Leibniz shows the influence of **Nicolas Malebranche** on his thought.

**SIN.** *See* EVIL.

**SKEPTICISM.** Leibniz was not sympathetic to total skepticism since he believed that some *a priori* truths could be known with **certainty**. He was, however, disposed to a kind of skepticism about **knowledge** based on the senses, believing that neither **René Descartes** nor anyone else had or could **demonstrate** that life is not one long dream. Certainty about what is known through the senses would not be absolute, unless we were granted a **beatific vision**, and in our present state it is no more than **moral**. But, in opposition to the skeptics, Leibniz insisted on the usefulness of **believing**. By the time he wrote his *New Essays*, he seems to have come to the view that such moral certainty was strong enough to constitute a kind of knowledge. *See also* ACADEMIC SKEPTICISM; EXTERNAL WORLD; FOUCHER, SIMON.

**SLAVERY.** *See* NATURAL LAW; MEDITATION ON THE COMMON NOTION OF JUSTICE.

**SOCINIANISM.** The doctrines of Socinus (1539–1604) and his followers. The Socinians denied the **Trinity** as well as the divinity of Jesus Christ and held a number of other beliefs that were judged herodox or worse by the larger Christian churches. Leibniz studied a text by the Socinian Christoph Stegmann and, on the basis of that study, attributed to the Socinians views he was particularly concerned to deny: that God's foreknowledge is limited by human **free will** and that the **soul** will die naturally with the **body**, being preserved only through divine grace (*see* A I vi 160). Socinianism was influential in the 17th century, not least in England, where it was taken up by **Isaac Newton** and some of **John Locke**'s associates, not to mention Locke himself, as Leibniz suspected. Leibniz saw fit to include in his *New*

*Essays* his general objection to the Socinians, who “are too quick to reject everything that fails to conform to the **order of nature**, even when they cannot conclusively prove its impossibility” (A VI vi 498). *See also* IMMORTALITY.

**SOPHIE, ELECTRESS OF HANOVER (1630–1714).** Sophie was one of the younger daughters of Friedrich V, the elector of Palatine, and an **English** princess, Elizabeth Stuart. In 1658 she married **Ernst August**, who became duke in **Hanover** in 1679 and later elector. As a Protestant granddaughter of James I, however, she had claims in her own right and, in 1701, she and her heirs were named in the Act of Succession as the future monarchs in Britain. She herself had no ambition to be the queen of England and, as it turned out, Queen Anne outlived her. Her son **Georg Ludwig** became king only two months after Sophie’s death.

Sophie, like her older sister **Elizabeth**, had wide intellectual and cultural interests. She was a good friend and supporter of Leibniz and, more than anyone else, made his life in the dull **Hanover** Court supportable. In a letter to his Scottish correspondent **Thomas Burnett**, he complained about the fact that, in Hanover, a courtier was not supposed to talk about learned matters: “Without the electress,” he added, “they would be spoken of even less” (GP iii 175). When Leibniz was away from Hanover, he **corresponded** frequently with the electress, offering her his opinions on any philosophical matter that interested her. Their correspondence and the relevant papers from Leibniz extend to three volumes of Klopp’s edition (K VII–IX).

**SOPHIE-CHARLOTTE, QUEEN OF PRUSSIA (1668–1705).** The daughter of **Ernst August**, elector of **Hanover**, and his consort **Sophie**. In 1684 Sophie-Charlotte was married to Friedrich, who became elector of Brandenburg in 1688 and the first king of Prussia in 1701. Though his heart had been given to another woman, Friedrich was in some ways good to his wife, who disliked the pomposity of Court life. He provided her with a sumptuous palace of her own at Lützenberg. He did not share her intellectual and cultural interests, but she was able to persuade him to establish the **Berlin** Society of Sciences.

Sophie-Charlotte had known Leibniz since a child and regarded him as her tutor in philosophy. Leibniz had an open invitation to

Lützenburg and had rooms of his own in the palace. Though she professed herself a disciple of Leibniz, however, the queen was impressed by the writings of **John Locke** and **Pierre Bayle** as well as by the ideas of the visiting **John Toland**. She encouraged Leibniz and Toland to engage in debate in her presence. But, so that she could think more about it, she also asked them to express themselves in the form of written papers. Some of Leibniz's most accessible statements of his position in contrast with that of other philosophers were written for her, including his *Sense and Matter*.

Sophie-Charlotte seems to have been an important influence on Leibniz's work as an author. She bade him put his views on Locke and Bayle in writing and so, directly or indirectly, encouraged him in writing both the books of his later years. His *New Essays*—his commentary on Locke's major book—and his *Theodicy*—which is in part a reply to Bayle—owe much to his wish to please her. In his preface to the *Theodicy*, Leibniz acknowledged his debt to “one of the greatest and most accomplished of princesses” and this “incomparable queen,” who had exhorted him first to comment on diverse passages of Bayle's *Dictionary* and then carry out the more systematic project. Sadly she lived long enough to see him give up the Locke project but died some years before the *Theodicy* saw the light of day.

**SOUL (ANIMA/ÂME).** The term *soul*, Leibniz wrote in 1710, can be used both broadly, to mean “life” or “vital principle,” and in a strict sense, to mean “the principle of internal **action** that exists in the simple thing or **monad**” (GP vii 529; W 504f.). Everything in the **universe**, according to Leibniz, is a soul though souls differ hugely in **perfection**. The nature of **substances** can therefore be understood by **analogy** with our own souls, from which we have an **idea** (albeit a confused one) of a substance. Souls in nature are never wholly separated from organic bodies but all are “naturally indestructible” because they are indivisible. *See also* CHAIN OF BEING, GREAT; IMMORTALITY; SOUL AND BODY, UNION OF; SOULS, ORIGIN OF; UNITY.

**SOUL AND BODY, UNION OF (UNIO ANIMAE ET CORPORIS, L'UNION DE L'ÂME ET LE CORPS).** The union of the **soul** and the **body** had often been seen as a great **mystery**. In his *Discourse on*

*Metaphysics*, Leibniz assumed that what was mysterious was how it was that the **actions** and **passions** of the one were always accompanied by appropriate passions and actions of the other. He thought his **hypothesis**—what he later called his **system** of **preestablished harmony**—elucidated this mystery. And, in his *New System*, he went so far as to claim that this “mutual relation” that **God** had preestablished is what “alone constitutes the union of soul and body” (§14). This claim did not convince some of his **correspondents**, however, and one of them—**René-Joseph de Tournemine**—extracted from him the admission that his system no more explained the union of soul and body than did **occasionalism**.

According to Leibniz’s system there is a **double kingdom** governing nature, one set of laws governing the soul in accordance with **final causes** and another governing the body in accordance with efficient causes. This suggests a kind of **dualism**. But Leibniz denied that **separated souls** were **substances** or indeed that pieces of **matter** considered apart from souls could be substances. The union of soul and body as one substance was, therefore, at once an essential and a problematic doctrine for him to maintain. Much earlier, in response to **Robert Boyle**’s remark that how the soul is affected by the passions of the body is a difficulty as great as any mystery in **theology**, Leibniz had made the note: “The difficulty about the union of the soul and body is as great as the difficulty about the **incarnation**” (A VI iii 227). He seems to have returned, under pressure, to something like this view, that the union of the soul and the body is a **mystery**, though not in a bad sense.

**SOUL OF THE WORLD.** See WORLD SOUL.

**SOULS, ORIGIN OF (ORIGO ANIMARUM/ORIGINE DES ÂMES).** Scholastic philosophers commonly adopted the **Aristotelian** view that **souls** or forms needed to be added to **matter** in order to make a living thing. The matter being there already, as it was supposed, there remained the question where these souls or forms came from. Some claimed that they were a special **creation**, others that they lay hidden in matter, and still others that they came out of nothing. Some of Leibniz’s older contemporaries, including his teacher **Jakob Thomasius**, wrote books on this controversy. Leibniz

himself toyed in his youth with other solutions, but his view from the mid-1680s on (expressed, for instance, in the *Theodicy*, §§86–91) was that, at least in the case of **animals**, there is no special creation of a new soul each time an animal is born. Neither is the soul conferred by its parents (**traduction**). Souls, because they are indivisible, are naturally indestructible, according to Leibniz. So there is, strictly speaking, neither birth nor **death**. All animal souls have existed since the beginning of **time**. Thus Leibniz partly agreed with those who said that souls are hidden in matter prior to the birth of an animal. In the case of rational souls, however, he was more equivocal. Sometimes he allowed that there is a special creation of each rational soul at the time of conception. But he more usually took the less orthodox view that human souls were animal souls from the beginning of time until **God** conferred rationality on them, a miraculous process he refers to as **transcreation**. See also PREEXISTENCE; TRANSMIGRATION OF SOULS.

**SPACE.** In his famous correspondence with **Samuel Clarke** in 1716, Leibniz opposed his **relational** theory of space to the absolute theory of **Isaac Newton**. Newton asserted that space was logically prior to objects, hence objects “occupy” space. With space conceived as a container, it would be meaningful to say that the total collection of all objects could have been situated in a different place from where they are, or could even be moved. Against this, Leibniz invoked his principle of **sufficient reason**. Since no distinction could be conceived to exist between different placements of the collection of all objects in absolute space, no sufficient reason could ever be produced for any *particular* placement. But the question of placement never really arises because, according to Leibniz, space is *not* a preexisting container for objects. Rather, space is a relation and is logically *posterior* to the **existence** of **substances**. Space is the matrix of relations of place between substances. In a letter to **Bartholomäus Des Bosses** in 1712, Leibniz writes that space is “the order of co-existing phenomena” (GP ii 450; L 604).

Against the Newtonian theory, Leibniz also advanced theological arguments. Before space can be shown to be a pure relation between substances, the existence of a plurality of substances needs to be established. As this **knowledge** is available only to the **infinite** mind, it

is only through proof of the existence of **God** that Leibniz's conception of space can be demonstrated. As an ideal numerical quality, space is not constituted of real parts. Hence division of a quantity of space—some distance between two objects—does not reduce to real parts: division does not come to an end with **atomic** parts that are not further divisible. Rather, as number, space can be divided ad infinitum, without any smallest distance being reached. Accordingly, the atom and its corollary concept, the **vacuum**, have no basis in **nature**. Conversely, in the same way that number can be multiplied up without end, so any distance can be increased indefinitely. Thus there can be no greatest distance, and the **universe** cannot be a bounded whole, but must extend without end in all directions. *See also* TIME.

**SPECIMEN OF DYNAMICS, A (SPECIMEN DYNAMICUM).** During the years 1689–1691 Leibniz worked on an essay called *Dynamics*. Here he summarized all those criticisms he had of the **principles** of the **physics** of **René Descartes** and **Isaac Newton**. In particular, he argued against Newton's conception of **force**, claiming that it added nothing to our knowledge of the nature of reality, that it was a mere pseudo-explanation or idealized **abstraction**. He argued that transfer of **motion** by **atomic** interaction, and **action** at a distance, were impossibilities.

Intellectual acquaintances criticized the *Dynamics*, and Leibniz left the manuscript in Florence. But, when interest in his ideas on physics grew a few years later, he produced a summary of the work, in two parts, giving it the title *Specimen dynamicum*. However, he only published the first part—in the *Acta Eruditorum* in April 1695—the second part not appearing until Carl Gerhardt published it in his *Leibnizens mathematische Schriften* (1849–1863). The *Specimen dynamicum* represents Leibniz's mature theory of **dynamics**.

**SPINOZA, BENEDICT DE (1632–1677).** A Dutch philosopher who, though educated at a Jewish school, was expelled from the synagogue in Amsterdam. He made a living through grinding and polishing lenses. Spinoza set himself to be an independent thinker and, partly for this reason, refused the offer of a chair in Heidelberg in 1673. By that time he had acquired an international reputation, partly as the author of *The Principles of Descartes's Philosophy* (1663) and the *Theologico-Political Treatise* (1670) and partly by rumors of him

that were spread among the learned. He had completed his most important work, the *Ethics*, before he died but had not wished to brave the consequences of publishing it.

Leibniz at first thought Spinoza was just another **Cartesian**, but once his *Tractatus* was published, Leibniz formed an altogether better sense of the Dutchman's originality. From meetings with disciples of Spinoza in **Paris**, Leibniz began to form the highest expectations of the demonstrative **metaphysics** the "master" was undertaking. On his way to **Hanover** in 1676, he visited Spinoza and spent a considerable time in discussion with him. Leibniz claimed to have convinced Spinoza of his own revision of the **ontological argument**, but if so, Spinoza did not alter his version. Leibniz was allowed access to some of Spinoza's unpublished manuscripts, probably including the text of the *Ethics*. Spinoza's ethical views, a kind of modern **Stoicism**, had some charm for the younger Leibniz, though he later opposed them. For a while too, Leibniz seems to have been drawn to Spinoza's metaphysics. But his considered views were opposed to the **monism, pantheism**, and determinism of the posthumously published *Ethics*.

It has been suggested that Leibniz underplayed the profound affinity of his own metaphysics with that of Spinoza and disguised his own philosophy with a veneer of more orthodox and palatable doctrines. There is little doubt, however, that Leibniz was really disappointed by the lack of rigor and clarity, as it seemed to him, in the published edition of Spinoza's *Ethics*, on which he wrote notes (GP i 139–50; L 196–205). Though there are many points of agreement between the two philosophers and some basis for expecting that Leibniz was influenced by Spinoza, Leibniz was strongly opposed to both the denial of **free will** and, as it seemed to him, of human **individuality** of the older philosopher. He believed he had succeeded, where others like **Nicolas Malebranche** had failed, in drawing a clear distinction between **God** and his **creation** and between God's activity and that of his creatures.

**SPINOZA, REFUTATION OF.** See WACHTER'S "ELUCIDARIUS CABALISTICUS," REMARKS ON.

**SPONTANEITY.** Something is "spontaneous," in the sense used by Leibniz (following **Aristotle**), if it arises out of a thing's own **nature**

rather than being due to an external **cause**. In Leibniz's **system of preestablished harmony**, no finite **substance** is an external cause of what happens to any other. Thus far he agrees with the **occasionalists**. He disagrees with their conclusion, however, that God is the only true cause of anything that happens in the **universe**. Leibniz's view is that everything that happens to a substance arises spontaneously from its own being or nature. God alone knows what is true of every substance since he alone can analyze the **complete concept** there is of each one. As this is true even for substances that lack **reason**, spontaneity is not the same as **free will**. However, in "intelligent substances," spontaneity "becomes liberty" (*Discourse on Metaphysics*, §32).

**STOICISM.** The Stoics were a school of **ancient** Greek philosophers, founded in Athens by Zeno of Citium around 300 B.C. and subsequently headed by Cleanthes and Chrysippus. The name of the school derives fortuitously from the fact that Zeno began lecturing in the Painted Porch; *stoa* is the Greek for "porch." Stoicism was taken up by a number of Romans—notably Epictetus, Seneca, and Emperor Marcus Aurelius. It was revived in the 16th century by Justus Lipsius and others and was highly influential in 17th-century philosophy.

The Stoics held that the world was a thoroughly orderly and rational organism that was preordained in every detail to produce the best possible outcome. Happiness was to be achieved by cultivating rationality in oneself and in discovering the place we occupy in the scheme of things.

Leibniz's debt to Stoicism, which he never studied much in its own right but which had been absorbed in various ways into the intellectual tradition to which he was indebted, was probably greater than he realized. He rejected Stoicism for fairly standard reasons, taking it to imply **fatalism** and to call for an attitude of resignation. At the same time, he accepted the Stoic view of the world as a single interconnected system—what he often referred to as "the **order**" or "the connection of things."

Some measure of the influence of Stoicism on Leibniz is to be found in a letter of 1671 to Magnus Wedderkopf (A II i 117–18; L 146–47) in which he argues that it is impossible for **God** not to be affected by the most perfect **harmony** and thus "to be necessitated to

do the best by the very ideality of things.” Leibniz insists this is consistent with God’s freedom, claiming that “it is the highest freedom to be impelled to the best by a right reason.” He later thought, however, that this was too strong and sought to correct his position by distinguishing between what happens necessarily and what happens infallibly. On the basis of this distinction, he claimed that his own philosophy was able to preserve “the Stoic connectedness” while leaving room for **spontaneity** and **free will** (GP iv 523; L 496).

Leibniz was conscious of the continuing influence of Stoicism on other philosophers, especially **Benedict de Spinoza**. He campaigned against the “the new Stoics” who claimed that God acts by a “blind necessity.” In a paper sometimes known as *Two Sects of Naturalists* (A VI iv 1384–88; AG 281–84), Leibniz characterized as among the beliefs of this **sect** of new Stoics that everything happens in the world by a “mechanical necessity,” that “God is . . . to the world what the spring or the weight is to a clock” (A VI iv 1385; AG 282). Spinoza’s denial of **final causes** and of a Providence made him an obvious philosopher for Leibniz to label in this way. Though **René Descartes** also rejected final causes in philosophy, Leibniz’s attempt to convict him of Stoicism—based on his denial of **eternal truths** of **justice** and goodness independent of the divine **will**—was contentious and unworthy. *See also* NATURALISM.

**STRIVING POSSIBLES.** All possible **existences**, according to Leibniz, are in the mind of **God**, though only a small number of them exist in the actual world. It might seem from many of Leibniz’s statements that the ones that exist are just those that God, in his **wisdom** and in accordance with his decision to **create** the best **possible world**, has seen fit to bring into actual existence. Leibniz, however, sometimes wrote—for instance, in his paper *On the Radical Origination of Things*—that all possibles had a claim to existence and indeed tend to come into existence in accordance with their “degree of **perfection**” (AG 150; GP vii 289). Indeed he wrote on several occasions as though there was some kind of **metaphysical** mechanism that determined what would exist and what would not.

This discrepancy has been pointed out by those who think that Leibniz had an **esoteric** philosophy closer to that of **Benedict de Spinoza** than he was willing to admit. By this interpretation, Leib-

niz's bland emphasis on God's **free will** in choosing what to create is contradicted by those passages in which he appears to speak of possible existents struggling to exist and coming to be or not in accordance with an impersonal deterministic process. Those who think Leibniz's real view is that God freely chooses what possibles to bring into existence try to explain away the language of striving possibles. One way of doing this is to suggest that Leibniz's talk of "striving possibles" is no more than a metaphor by means of which he wished to express his view that God created the best possible world because it was the best possible and not, as the **voluntarists** claimed, that it is the best because God created it.

**SUÁREZ, FRANCISCO (1548–1617).** A Spanish Jesuit philosopher and **theologian** whose interpretations of **Aristotle** were highly influential among 17th-century philosophers. Suárez's *Disputationes metaphysicae* (1597) went into 18 editions in the 17th century alone. Though he was expected to follow **Thomas Aquinas**, he often departed from the Thomist view. He strongly influenced Leibniz's teacher at **Leipzig**, **Jakob Thomasius**, and Leibniz claimed that, as a student, he could read Suárez like a novel. The young student broadly followed the Jesuit's account of **individuation** in his undergraduate dissertation. Though in later life he was often critical of Suárez, for instance, of his theory of **influences**, Leibniz retained a high respect for him as "one of the deeper **scholastics**." In addition to his contributions to **metaphysics**, Suárez wrote an important contribution to **jurisprudence** in his *De legibus ac deo legislatore* (1612).

**SUBJECT AND PREDICATE.** See *INESSE PRINCIPLE*.

**SUBSTANCE (SUBSTANTIA/SUBSTANCE).** A term deriving from **Aristotle** to refer to the subjects of predication and the objects of **scientific** inquiry. It became a key term of **metaphysics** because substances are the fundamental entities of which the **universe** is constituted. In **René Descartes**'s philosophy, there are three distinct kinds of substance: **God**, **matter**, and minds. In the **pantheistic** system of **Spinoza**, on the other hand, there is only one substance, which he refers to as "God-or-Nature."

Leibniz's considered view is that there are two fundamentally different kinds of substance: **God**, who is a pure spirit, and **created** substances, all of which have **bodies**. All substances must, according to Leibniz, be capable of **action**. Only God is pure activity, that is, lacking entirely in passivity; all creatures have some activity and are in varying degrees passive. There is, for Leibniz, a hierarchy of created substances, ranging from creatures close to God, such as **angels**, to **animals** that have senses but lack **reason**, to even more basic **corporeal substances**. Humans—capable of reason and therefore made in the **image of God**—are above animals but lower than angels.

A substance must, according to Leibniz, be a real **unity**. At one time he seems to have held the view that the unity of corporeal substances was underwritten by their **substantial forms**. But his later view seems to have been that every substance must be some kind of living thing, with something like **perception** and something like **appetition**. He later referred to his simple substances as **monads**. However, Leibniz seemed also to want to admit complex substances as more than an **aggregate** of simple substances. He did this by saying that, although there is nothing more to a complex substance than its constituent monads, its unity arises because one of these is the dominant monad.

Leibniz's theory of substance is the linchpin of his metaphysics. Each substance, according to Leibniz, is quite unique. He thought that the **complete concept** of each individual substance contained within itself everything that is true of it. Correspondingly, the **nature** or **essence** of each substance was such as to give rise **spontaneously** to all its phenomena. No substance except God can act on any other substance, nor can it be acted upon by any other substance. The *appearance* of **interaction** between substances is to be explained in terms of a **preestablished harmony** that God has foreordained from the beginning of **time**. *See also INESSE PRINCIPLE; VINCULUM SUBSTANTANTIALE.*

**SUBSTANTIAL CHAIN.** *See VINCULUM SUBSTANTANTIALE.*

**SUBSTANTIAL FORM (FORMA SUBSTANTIALI).** A characteristically **scholastic** notion intended to denote that quintessence by *virtue of which* something is an individual **substance** of a certain

kind. According to those scholastics who believed that there are natural kinds or **essences in nature**, each kind of thing has a separate substantial form because of which it is the kind of thing it is. The use of substantial forms in attempting to explain particular phenomena was regarded by the defenders of **Modern philosophy**, including Leibniz, as obscurantist.

Leibniz, for his part, believed that there was a place for substantial forms, rightly understood, in **metaphysics**. He presented his thoughts to **Antoine Arnauld**—who, as a Catholic **theologian** he could presume to be used to scholastic terminology—in terms of substantial forms. Leibniz was willing to think in scholastic terms that a piece of **matter** was a particular piece of bread or of marble because of its substantial form. But Arnauld posed for him a question that he was unable to answer: Supposing that the substantial form of the marble makes it a single piece of marble, what happens to the substantial form when the marble is cut in two? It is clear from Leibniz's reply that by late 1686 he was not satisfied with his account of substantial forms.

This may largely explain the fact that, in his later writings, Leibniz puts less stress on the notion of substantial form. Another factor was that use of any scholastic terminology was a provocation to some Modern philosophers, particularly the **Cartesians**. In his *New System*, Leibniz admits that he was attempting to revive substantial forms—despite the fact that they “are so decried these days”—but was doing so in such a way as to separate the use that *should* be made of them from their previous misuse (§3). He goes on to say that the nature of substantial forms consists of **force** and so to equate them with **souls** or **entelechies**.

**SUFFICIENT REASON, PRINCIPLE OF (PRINCIPE DE LA RAISON SUFFISANTE)**. The principle that nothing happens unless there is a sufficient reason for it is one of the most fundamental **principles** of Leibniz's **metaphysics**—which he included among the **primary truths** that were known *a priori*. The principle is formulated in different ways by Leibniz at different times. He took it to imply that every event has a **cause** and that there is a complete explanation for everything, even though we may not know and perhaps *cannot* know what it is. He also used it in conjunction with other principles, such

as that of **perfection**. Particularly in some of his important writings of the late 1680s, he identified it with the *inesse principle*—that the predicate concept of any true proposition is always included in the **complete concept** of its subject, though in the case of **contingent truths**, this can be seen only by **God**.

Leibniz made extensive use of the principle of sufficient reason in his metaphysics, for instance, in order to demonstrate the **existence** of God or to deny the existence of **vacua** or **atoms**. It plays a key role in the articulation of his theory of **free will** and his denial of a liberty of **indifference**. Leibniz's acceptance of the principle makes him in modern terms some kind of "determinist" and, since he thinks that he can accept the principle and still accept free will, he is commonly classed as a "compatibilist."

The principle plays an important part in any of Leibniz's attempts to lay out his metaphysics in a **demonstrative** form, such as his *Primary Truths* or his *Specimen of Discoveries* (A VI iv 1615–26; P 75–86).

**SYNTHESIS (SYNTHESIS).** The converse process or processes to **analysis**. For Leibniz, a synthesis can proceed in one of two ways. It can begin with simple **ideas** and build to more complex ones, as in the art of **combinations**, or it can begin with **primary truths** and seek to **demonstrate** as-yet-unknown truths, as in the art of **discovery**. Leibniz makes something of the importance of synthesis in some of his more programmatic writings, but in practice it was less important to him than analysis.

**SYSTEM.** A term referring to any theory in **science** or philosophy that provides an explanation of puzzling phenomena. Leibniz knew of **René Descartes's** "system of the world" and **Ralph Cudworth's** "intellectual system" of the world. He adopted the term, in preference to *hypothesis*, to refer to his own view of **preestablished harmony**, partly because it was an alternative to **Nicolas Malebranche's** account of the true nature of **causation**, which was referred to in the literature as "the system of occasional causes." After the publication of his *New System*, Leibniz assured one of his **Paris** correspondents that his system was "not a complete body of philosophy" and that he

made no claim to explain “everything that others have claimed to explain” (GP vii 451; L 472). Nonetheless a good system was one that was able to explain a good deal. And Leibniz himself frequently boasted of the power of his system to make sense of many diverse puzzles.

Leibniz did indeed have at least two systems that are consistent and harmonious but relate to very different puzzles. What he also referred to in other contexts as his “system”—that of the *Theodicy*—was one in which **free will** was as central as the preestablished harmony was in the other system by which he was well known. The fashion for the term *system* in the late 17th century led to its becoming a term of abuse in the hands of writers during the Enlightenment period, when Leibniz’s “system of optimism” became a paradigm of the kind of **metaphysics** that was widely condemned.

A system is an organized body of propositions and, though he usually presented his own system informally in his later writings, it is clear that Leibniz never gave up the view that systems should be organized according to the method of **geometry**. Although, for instance, he offered a loose autobiographical mode of presentation in his *New System*, he did so to make it more acceptable to readers of the *Journal des Sçavans*. In a letter written to **Simon Foucher** around the time of publication, he clearly indicated that the second part followed logically and not merely chronologically from the first:

The whole of my system is founded on the consideration of the real **unities** that are indestructible and *sui juris*, each of which expresses the whole **universe** in a manner special to it and by the laws of its own nature while it receives no external **influences** besides that of **God**. (GP i 423)

Foucher was one of those who would have wanted to see the system organized in a more rigorous way. Curiously there are few attempts by Leibniz to do this. A particular interest attaches, accordingly, to papers such as his *Primary Truths*, in which certain **axioms** are assumed and many elements of Leibniz’s system set out so that it is apparent how they might be derived as theorems.

**SYSTEM OF THEOLOGY.** See *EXAMINATION OF THE CHRISTIAN RELIGION, THE*.

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**TELEOLOGICAL ARGUMENT.** One of the three broad categories of **argument for the existence of God** as presented and critiqued by Immanuel Kant. More commonly known as the “argument from design,” this is an *a posteriori* argument based upon the observed orderliness of the **universe**. As the term *teleological* implies, the argument concludes that this **order** reflects the purposes of an intelligence by whom it was created.

Leibniz’s belief that the orderliness of the universe reflected the **wisdom** of its **creator** and his eagerness to defend **final cause** explanations made him sympathetic to the teleological argument. In his *Principles of Nature and Grace, Founded on Reason*, for instance, he remarks that it is necessary to have recourse to final causes that depend “on the principle of **fitness**, that is to say, on the choice of wisdom,” adding that “this is one of the most effective and sensible proofs of the existence of God for those who are able to go deeply into these matters” (§11).

**THEISM.** This term is not used by Leibniz but by later writers to refer to the doctrine that the world was created by an omniscient and omnipotent **God**, who is conceived as both distinct from his **creation** and yet present in it—that is, God as both transcendent to and immanent in the world. His presence in the world is usually claimed to be in the form of direct active intervention, such as communication to his creatures, responding to their supplications, performing **miracles**, and so on. In this way, God tends to acquire personal characteristics, such as those attributed by the adherents of the Judeo-Christian tradition.

Leibniz’s conception of God and God’s relation to the world is essentially theistic insofar as he asserts that God is both transcendent to and immanent in the world. He is transcendent in that his **substance** is really distinct from that of the created thing. God’s substance is necessary and **infinite**; the created substance is contingent and finite. But God is immanent in created substances, too, insofar as they depend continually on him, the necessary substance, for their ongoing contingent **existence**. Furthermore, each created **monad**, in being the way it is, reflects God’s omniscient comprehension of all things and his **will** to do the best.

Leibniz addresses two recurrent problems for theism. First, if God is omniscient and omnipotent what, if anything, is left of human freedom and what is the point of making supplications to God? In Leibniz's **preestablished harmony**, every last detail of history has already been predetermined by God. Leibniz defines a substance as free when the **sufficient reason** for its actions lies in that substance itself. From this one can say that it is only **hypothetically** and not **absolutely necessary** that substances make the choices that they do and that this is, he claims, sufficient for free will.

A second problem for theism is how there can be **evil** in the world if God is omnipotent and omnibenevolent. Leibniz's solution is that an absolutely **perfect** world is not possible: such a world would be indistinguishable from the divine realm. God does exercise the maximum **power** and benevolence—in producing the most perfect world that there can possibly be. Leibniz addressed these problems in a number of writings, especially in his *Theodicy*. See also DEISM; GOD AND THE WORLD; INCLINING WITHOUT NECESSITATING; OPTIMISM; PANTHEISM.

**THEODICY (ESSAIS DE THEODICÉE)**. This book, named in full *Essays of Theodicy, on the Goodness of God, the Freedom of Man and the Origin of Evil*, was finally published in 1710, although Leibniz had been working on it some years earlier. The term *theodicy* is a Greek concoction by Leibniz himself meaning, as he explained in a draft preface, “**justice of God**” (Gr 495). He omitted this explanation in the published book, however, and the word so baffled some of his readers that they assumed it was the name or pseudonym of the author. The book became so famous, however, that the word *theodicy* has entered the English and other languages as a way of referring to any general explanation of how there could be **evil** in a world **created** by a wholly good and omnipotent deity.

In the *Theodicy*, Leibniz was particularly concerned to reply to **Pierre Bayle**, who had maintained that it was impossible rationally to reconcile belief in a wholly good God with the existence of evil in his creation. Christianity thus required a **faith** that is contrary to **reason**. Leibniz prefaced his book with a substantial *Preliminary Dissertation* in which he sought to defend his view of faith as above reason but never in **contradiction** with it. In part 1, he sought to give an

account of the nature and origin of evil and to defend belief in a wholly good God as not contrary to reason. In this systematic core of the work, he also addressed topics such as the origin of **souls**, human **free will**, and God's **knowledge of future contingents**. In the remaining two parts, Leibniz included his detailed replies to Bayle, which he had probably drafted some years earlier at the instigation of **Sophie-Charlotte**, queen of Prussia. The first of these is concerned with moral evil or sin, and the second, with natural evil.

The *Theodicy* was the only philosophical book published by Leibniz after his reputation had been established. It was written in his informal though erudite popular (**exoteric**) style, though he was persuaded to add, as an appendix, a more formal summary of his argument in scholastic Latin. Though he found an excuse to incorporate some account of his **system of preestablished harmony**, the *Theodicy* is not the place to look for a basic account of Leibniz's philosophical ideas. Nonetheless it was the book by which Leibniz was best known as a philosopher in the 18th century.

**THEOLOGY (THEOLOGIA/THÉOLOGIE)**. The study of God and divine things. Leibniz distinguished fundamentally between revealed theology, which could teach us about **mysteries** that were above (though not contrary to) **reason**, and **natural theology**, which was concerned with that (to Leibniz) important area of religious matters that were accessible to reason, such as the **existence of God** and the **immortality of the soul**. In addition, Leibniz sometimes referred to what he called "**mystical theology**." See also REVELATION.

**THEORY OF ABSTRACT MOTION**. See *NEW PHYSICAL HYPOTHESIS*.

**THEORY OF CONCRETE MOTION**. See *NEW PHYSICAL HYPOTHESIS*.

**THOMASIUS, JAKOB (1622–1684)**. Professor of rhetoric, dialectic, and moral philosophy at **Leipzig** University and the most influential of Leibniz's teachers when Leibniz was a student there in the early 1660s. Thomasius was an **eclectic** and an erudite historian of philosophy, though he was not well disposed to **Modern philosophy**. He

was the author of *Origines historicae philosophiae et ecclesiasticae* (2nd ed., 1669) as well as a book on the origin of forms, a topic to which Leibniz himself frequently turned. The two men corresponded between 1663 and 1672, the year of Leibniz's departure for **Paris**. Leibniz sought to persuade his teacher that the new philosophy could be reconciled with the teachings of **Aristotle**, properly understood. He inherited from his teachers a willingness to look for what is true in the writings of others rather than dismiss them entirely because of some obvious faults. The **correspondence** is now published in the Akademie Edition (A II i).

**THOMISM.** See AQUINAS, THOMAS.

**THOUGHTS ON VITAL PRINCIPLES AND PLASTIC NATURES (CONSIDÉRATIONS SUR LES PRINCIPES DE VIE ET SUR LES NATURES PLASTIQUES).** See VITAL PRINCIPLES AND PLASTIC NATURES, THOUGHTS ON (CONSIDÉRATIONS SUR LES PRINCIPES DE VIE ET NATURES PLASTIQUES).

**TIME.** **Isaac Newton** had argued in favor of absolute time, that it was logically prior to the **existence** of objects. This implies that it would be meaningful to ask whether the **creation** of objects could have occurred at a different time, earlier or later. Leibniz seeks to refute this by the principle of **sufficient reason**. Prior to the creation of objects, no distinction of earlier or later can be imagined, and therefore a sufficient reason for why creation occurred at a particular time cannot be given. But, more generally, Leibniz argues that time is not logically antecedent to objects. In a letter to **Bartholomäus Des Bosses** in 1712, he writes that “time is the order of successive phenomena” (GP ii 450; L 604). As the **relation** between perceptual states of objects, time presupposes the existence of objects. That it is “evident that *I think various thoughts*,” that is, that there are successive phenomena, is taken as an indubitable **truth** by Leibniz (*New Essays*, A VI vi 367).

As a **continuum**, any period of time is divisible ad infinitum, such that there can be no smallest element of time. In accordance with the law of **continuity**, there can be no discrete periods of change, no leaping from state to state. Thus **nature** is a temporal **plenum** or is in **flux**. Conversely, time periods can be multiplied up ad infinitum, so

that there can be no one greatest overarching period of time. Thus there can be no beginning or end to the succession of things or the world. *See also* SPACE.

**TOLAND, JOHN (1670–1722).** Irish **freethinker, deist, pantheist, materialist, and empiricist.** Toland acquired some notoriety as the author of *Christianity not Mysterious* (1696)—a work that was burned by the public hangman in Dublin and resulted in Toland’s self-exile to mainland Britain. He professed himself a disciple of **John Locke**, though Locke took the advice he was given not to be associated with Toland. Toland came to **Hanover** as part of a British delegation, and his conversation and provocative charm impressed the electress **Sophie**. However, to avoid her (as prospective heir to the British throne) becoming tainted with religious controversy, she was advised not to receive him anymore, and Toland was effectively banned from the Hanover Court. He was still welcome, though, at the palace in **Berlin** of the electress’s daughter, **Sophie-Charlotte**, queen in Prussia. Leibniz was in residence there in the summer of 1702 and throughout the period of several months when Toland made his one extended visit.

The queen encouraged Leibniz and Toland to conduct debates in her presence and also asked them to commit their arguments to writing so that she could reflect on the matters they raised at her leisure. As a result some of the contributions the two men very probably made to these debates have survived. For instance, Leibniz’s important paper *Sense and Matter* states and defends his objections to empiricism and materialism, a combination cheerfully embraced by Toland, though not by Locke. In addition, his paper *Reflections on the Doctrine of a Single Universal Spirit* (GP vi 529–38; L 554–60) was probably written, in part, as a corrective to the form of pantheism embraced by Toland.

Toland, for his part, published some of the presentations he made at the Berlin Court in his *Letters to Serena* (1704). He was more concerned there to state his own views than to criticize Leibniz, but he read Leibniz’s 1702 reply to **Pierre Bayle** and, at the queen’s behest, wrote his opinion of Leibniz’s philosophy. His *Critical Remarks on Leibniz’s System* was published anonymously in 1716, when Leibniz published a reply, suspecting Toland but wrongly concluding it must have been someone else who had attacked his philosophy. Toland had

formed the view that **mathematicians**, being accustomed to using abstractions in their own area where it was safe to do so, should not dabble in **metaphysics**, where it was not. This critique, which he produced in his *Letters to Serena* against the English mathematician Joseph Raphson (to whose views about absolute **space** he objected), was reused almost verbatim against Leibniz. He seized on Leibniz's use of the phrase "metaphysical points" to talk about **monads** and accused Leibniz, in effect, of reifying abstract entities.

Leibniz and Toland **corresponded** on various topics, including **Giordano Bruno**, but the correspondence does not touch on the fundamental opposition between their philosophies. Toland probably influenced Leibniz's later writing in two ways. First, he added to Leibniz's perception of Locke's *Essay Concerning Human Understanding* as a work that tended toward materialism. Second, Toland's *Christianity not Mysterious*, on which Leibniz left some notes, probably contributed to the development of his plans for his *Theodicy*. He objected to Toland's dismissal of **mysteries** and, in particular, his denial of the distinction between what is *above* reason and what is *contrary* to it: a distinction that he emphasized in his *Preliminary Dissertation*.

**TOURNEMINE, RENÉ-JOSEPH DE (1661–1739)**. French aristocrat, born in Rennes, who became a Jesuit priest and a man of letters. In 1701 Tournemine became the founding editor of the **journal** *Mémoires pour l'Histoire des Sciences et des Beaux Arts*, usually known after its place of publication as the *Mémoires de Trévoux*. In 1703 he included in his journal a piece of his own entitled *Conjectures on the Union of Soul and Body* (pp. 864–75 and 1063–65: see WF 247–49). Tournemine accepted Leibniz's criticisms of **occasionalism** but claimed that his **system** fared no better as a theory of the union of soul and body: "*correspondence*, or **harmony**, does not make a *union*, or essential connection" (WF 249). Leibniz replied in the following year, agreeing that his system could not indeed "create a genuine **unity**" any more than that of the **Cartesians**. What he had tried to do, however, is "to explain naturally what they explain by perpetual **miracles**" (WF 250). Forgetting what he had written in his *New System*, to which Tournemine was responding—that the correspondence between the events of the **soul** and those of the **body** was what constituted the union of soul and body—he was willing to

acknowledge that he had not explained the union and indeed that it was like a mystery in not being something humans could explain.

**TRADUCTION** (*TRADUCTIO/TRADUCTION*). A theory about the origin of **souls**, a controversial topic in Leibniz's time and one he addressed in his *Theodicy* (§§86–91). According to this theory, the souls of children derive from or are “engendered”—Leibniz writes “*engendrée (per Traducem)*”—from the souls of their parents. This view was favored by **Augustine**—partly because it helped to make sense of original sin—and by “most **theologians** of the **Augsburg Confession**.” Leibniz was, nonetheless, quick to dismiss it as “inexplicable” how souls could arise in this way. His preferred view was that of **transcreation**, according to which **animal** souls, which have existed since the beginning of **time**, have added to them a new “**perfection**” (**reason**) by a special divine operation.

**TRANSCREATION** (*TRANSCRÉATION*). A term concocted by Leibniz for the view he adopted on the origin of human **souls** (*Theodicy*, §91). Leibniz held that souls were “naturally **immortal**”; they could come into **existence** only through **creation** and go out of existence only by **annihilation**. The process of life and **death**, as ordinarily understood, involves no more than successive **transformations** of the same indestructible soul. All souls, he concluded, must have existed since the beginning of **time**. Yet human souls have, he believed, existed as such only for the life they know, contrary to the doctrine of the **transmigration of souls**. He concludes that human souls are **animal** souls to which the divine spark of **reason** has been added by a kind of supplementary act of creation. The **generation** of rational souls has to be understood as a **miraculous** process in Leibniz's philosophy.

**TRANSFORMATION OF ANIMALS** (*TRANSFORMATION DES ANIMAUX*). Leibniz held that **animals** are, strictly speaking, indestructible and argued accordingly that there is neither **generation** of a new animal nor **death**, but only transformation of an existing one. All **souls** were **created** by **God** at the beginning and can only go out of existence by some **miraculous** intervention that resulted in their **annihilation**. Leibniz thought that **nature** provided many examples of the radical transformation of existing animals, such as caterpillars chang-

ing into butterflies. When an animal appears to be destroyed, its essential nature is “**enveloped**” (hidden from view) as its gross **body** is broken up. But the dominant **monad** continues to exist, together with its “subtle” body, and remains ready to expand or “develop” again, bringing together more and more **matter** so that it eventually returns to the world we observe, though perhaps in a quite different form.

Leibniz’s basis for belief in transformation was largely *a priori* and dates to early writings, for instance, those on the **resurrection**, for which he thought natural processes provided an **analogue**. But, in later presentations of the doctrine such as that offered in the *New System*, he tended to rely more on the **empirical** evidence provided, as he believed, by the **microscopists**. This was, however, only a difference of emphasis. Even in the *New System* his argument for saying that souls are naturally **immortal** and can only begin by creation and end by annihilation is an *a priori* one. See also PREFORMATION.

**TRANSMIGRATION OF SOULS (TRANSMIGRATION DES ÂMES).** A doctrine, associated by Leibniz particularly with **Pythagoras**, according to which **souls** never die but enter into and make new living things. Leibniz’s friend, **Francis Mercury van Helmont**, was noted as an advocate of the partly similar view of the Luritanic **Kabbalah**, that human souls never die but are “revolved” into new people 12 times. Leibniz thought there were clear **empirical** objections to this doctrine, such as the fact that a large number of human **deaths** is not always counterbalanced by the same number of births. He also objected to the doctrine of transmigration generally that it was contrary to the nature of things, specifically to his law of **continuity**, that **nature** never acts by leaps. He accepted that living things were indestructible but argued, so far as **animals** are concerned, that one and the same animal was **transformed** and did not strictly undergo **generation** or death.

In his published writings, for example, the *New System*, he tended to say that rational souls were subject to special laws of divine grace. In such writings he was often content to be dismissive of transmigration, which—from the point of view of mainstream Christianity—was a heterodox doctrine. But he could give a good sense to it provided it did not require the soul to be **separated** from *all* forms of **body**. He did this in

his *New Essays* when he linked it to a ready extension of his theory of transformation to human souls, his philosophical theory of the **resurrection**. But, while Leibniz believed in the continuing **existence** of human souls after death, he rejected the view that they **preexisted** as human souls. Though they had existed since the **creation** of the world as animal souls, they needed a special divine act of what Leibniz called “**transcreation**” to become human souls.

**TRANSUBSTANTIATION** (*TRANSSUBSTANTIATIO*). A term introduced by the Council of Trent to refer to the Catholic doctrine of the **Eucharist**, according to which there is a **substantial** change of the bread and wine into the **body** and blood of Christ. This doctrine differed in detail from the teaching of those who followed the **Augsburg Confession**. But these differences were minor, at least in Leibniz’s opinion, compared with the threat to the received doctrine from **Modern philosophy**. As Leibniz explained in an early letter to the Catholic convert **Johann Friedrich**, once this new philosophy was accepted, “all the wondrous and **mysterious** notions by which the **scholastics** used to support the Eucharist” (A II i 163) would fall to the ground. Leibniz claimed that he could explain how his own philosophy “will show the possibility of the Eucharist as explained in the Council of Trent—something many will think unbelievable.” From his early writings in **Mainz** to his late **correspondence** with **Bartholomäus Des Bosses**, Leibniz sought to show how his philosophy, while impeccably Modern, could provide room for transubstantiation. Though this was not, for him, a matter of defending his personal convictions, it was a good selling point for his own philosophy in the Catholic world. It had been a stumbling block for the acceptance of the philosophy of **René Descartes** that it seemed to rule out transubstantiation.

**TRINITY**. One of the fundamental tenets of orthodox Christianity, according to which God the Father, God the Son, and God the Holy Spirit are three persons in one **substance**. Some Protestants questioned whether the doctrine was authorized by **Scripture**, and the **Socinians** went so far as to deny it. Leibniz regarded it as a **mystery** that was part of **revelation** and so not something that could be **demonstrated** by philosophy. There were those who dismissed the

doctrine as **contradictory** and, in response to them, Leibniz thought it appropriate for a philosopher to demonstrate its possibility. *See also* INCARNATION.

**TRUTH (*VERITAS/VÉRITÉ*)**. Leibniz embraced a theory of truth, at least during the period he held the *in esse* principle to be applicable to all propositions—that is, that a true proposition was one in which the concept of the predicate is contained in that of the subject. In the case of **necessary truths**, it would be possible to **demonstrate** this by **analysis** of the terms of the proposition. In the case of **contingent truths**, however, only **God** could complete the analysis. The *in esse* principle was prominent in his **correspondence** with **Antoine Arnauld**, who thought it committed Leibniz to **fatalism**. Leibniz replied without compromising the principle, remarking at one point that, if it did not consist in the predicate being in the subject, he did not know what truth was (GP i 63; L 337). The principle was supported by Leibniz’s **logic**, according to which all propositions could be reduced to propositions in the subject-predicate form. *See also* ETERNAL TRUTHS.

**TSCHIRNHAUS, EHRENFRIED WALTHER VON (1651–1708)**.

Tschirnhaus was a nobleman who studied in Leiden. He was skilled in **mathematics** and was at one time a **Cartesian**. In 1673, while in Amsterdam, he became friendly with disciples of **Benedict de Spinoza** who provided him with access to the philosopher’s writings. Tschirnhaus may even have met Spinoza. In August 1675 Tschirnhaus arrived in **Paris** and met Leibniz through a letter of recommendation from **Henry Oldenburg**. A friendship ensued, which lasted until his death. While together in Paris, Leibniz and Tschirnhaus exchanged ideas and results in mathematics, worked together on problems of harmonic series, and examined some of Blaise Pascal’s manuscripts. Leibniz wrote to Oldenburg that Tschirnhaus had a keen intellect and showed great promise. They continued to **correspond** after Leibniz left Paris, though this ceased for a few years in 1683 due to a dispute over some articles Tschirnhaus had published. Leibniz accused Tschirnhaus of trying to pass off the ideas of others—that is, of Leibniz himself—as if they were his own, and of impatiently claiming generality for results that had been **demonstrated** only in a particular case. However, they resumed contact, and in 1704 they met in Dresden, where the two

proposed to collaborate in the establishing of a society of **sciences**—a project that was not, however, to be fulfilled.

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*ULTIMATE ORIGINATION OF THINGS, ON THE.* See *ORIGINATION OF THINGS, ON THE RADICAL.*

**UNCONSCIOUSNESS (ÉTOURDEMENT).** Leibniz rejected a substantial distinction between mind and **matter**: both were comprised of one type of **substance**—the **monad**. A mind or **soul** has a **perception** of an extended thing insofar as it represents singly the multiple or repeated perceptions of the monads that comprise the extended material **body**. The single perception of the soul, accrued as it is out of a multiplicity, is accordingly greater, more vivid, than those perceptions of the body. The perceptions of which we are sensible (our conscious and self-conscious perceptions) are thus representations of perceptions of which we are not sensible: they are unconscious, insensible, indistinct, or *petite* perceptions. To illustrate this, Leibniz often used the **analogy** of the roar of the sea: What we hear is the **aggregated** sound of thousands of individual waves breaking, even though we could not hear the noise of a single one of these waves. And yet, Leibniz writes, “we must be affected slightly by the **motion** of this wave, and have some perception of each of these noises, however faint they may be; otherwise there would be no perception of a hundred thousand waves, for a hundred thousand nothings cannot make a something” (A VI vi 54).

It is the tripartite classification of perception according to its vivacity of clarity or distinction—unconscious, conscious, and self-conscious—that provides the basis for Leibniz’s three types of monad. It is the bare monad or mere **entelechy** to which unconscious perception is assigned. Creatures that are without **memory** remain in a permanent state of unconsciousness, though creatures that are endowed with the faculty of **memory**, or even, additionally, with **reason**, such as ourselves, nevertheless are reduced to mere bare monads when we sleep dreamlessly. If this were not the case, then our souls and our minds would have to be re-created *ex nihilo* on waking. Accordingly, Leibniz rejects **René Descartes**’s identification of mental substance

with only the conscious and the self-conscious levels of perception. For Leibniz, the unconscious is not a mode of **matter**, a mere physical mechanism, but is a fully fledged mode of mental substance.

The perceptions of monads, whether they be conscious or self-conscious perceptions or unconscious insensible ones, are brought about by the monads' **appetitions**. These appetitions, or impulses to new perceptions, operate at the unconscious as well as the sensible level.

The soul does many things without knowing how it does them, when it acts by means of confused perceptions and insensible inclinations or appetitions, of which there is always so very great a number that it is impossible for the soul to be conscious of them or to separate them distinctly. (GP iv 550)

*See also* APPERCEPTION; EXTENSION.

**UNIFORMITY OF NATURE.** *See* ANALOGY.

**UNION OF SOUL AND BODY.** *See* SOUL AND BODY, UNION OF.

**UNITY.** Leibniz accepted without question the principle that the terms *being* and *unity* are interchangeable, and for him, therefore, the fundamental question of **metaphysics** concerns the nature of the "true unities" or beings that constitute the **universe**. His **monadology** is his final answer to that question. It is a consequence of Leibniz's view of unities that most beings are not true unities but only **aggregates** or beings by aggregation. But such beings would only **exist** because there are true unities out of which they are composed, just as a flock of sheep would be nothing but for the individual sheep that make it up.

**UNITY, CHURCH.** *See* CHURCH UNITY.

**UNIVERSAL CHARACTERISTIC.** *See* CHARACTERISTIC, UNIVERSAL.

**UNIVERSAL LANGUAGE.** *See* CHARACTERISTIC, UNIVERSAL.

**UNIVERSAL SCIENCE.** *See* SCIENCE, UNIVERSAL.

**UNIVERSE.** The world or universe is the totality of all **created** beings throughout all **time**, that is, of all simple **substances** and their

unfolding interrelations as **corporeal substances**. Because **space** is a **continuum**, any and every part of the universe contains an **infinity** of **monads**, and the universe as a whole is a **plenum** of monads. Furthermore, this plenum is without bounds, extending in all directions without end. Because time is a continuum, any and every period of time contains an infinity of moments: there can be no actual stasis: the universe is in **flux**—the monadic relations that comprise corporeal substances are in constant change. And since time is without any greatest magnitude, the universe can have neither beginning nor end. Thus the universe was not created at a point in time, nor at the “beginning of time.” The world was created insofar as **God** had a **sufficient reason** for its contingent existence; and because this sufficient reason is grounded in his goodness, this universe must be the best of all **possible worlds** that—**logically**—could have been created.

**UNUM PER ACCIDENS VS. UNUM PER SE.** Leibniz attached the highest importance to a distinction between those entities that were true **unities**—which were indivisible and which were the fundamental entities in the universe—and those that were not. Only an entity of first kind was what, in **scholastic** terminology, he referred to as *unum per se*. In contrast to such an **essential** unity, as possessed by true **substances** or **monads**, was the **accidental** unity of those entities referred to by most common nouns, which were mere **aggregates**. Leibniz used *flock* and *army* as examples of terms referring to entities that possessed only accidental unity (*unum per accidens*). His reader might be expected to find no difficulty with these examples. But Leibniz also thought that what others thought of as material substances were not *unum per se* but only *unum per accidens* and so not true substances at all. More problematic still, for Leibniz himself, were living things such as **animals**, which he was inclined to admit as true substances insofar as they are indestructible but treated in other ways as having no more than accidental unity. *See also* DEATH.

**USEFULNESS OF BELIEVING.** *See* BELIEVING, USEFULNESS OF.

– V –

**VACUUM.** The young Leibniz, impressed by the work of **Pierre Gassendi**, asserted the doctrine of **atoms** and the void or vacuum. But, in the 1670s, he came to reject this doctrine, favoring instead the belief that nature was a **plenum**. His *De summa rerum*, written at this time, contains arguments both for and against the vacuum, though the arguments against are fundamentally the same as those of his mature view on the subject, as set out in his correspondence with **Samuel Clarke**. According to Leibniz, **space**, as a **continuum**, is **infinitely divisible**. There can be no smallest parts of **matter**, and the concept of the atom, along with its corollary concept, the vacuum, must be rejected. He also advances an argument based on the **perfection of God** and the principle of **sufficient reason**. God's goodness makes him **create** the most perfect world that can exist: that with the maximum amount of being (as well as variety). Leibniz asserts that there is no reason why God cannot and does not put things everywhere in space, hence the existence of a vacuum would be contradictory to God's perfection. To Clarke he writes that "to admit a vacuum in nature, is to ascribe to God a very imperfect work" (GP vii 378; L 691). Instead of the vacuum, Leibniz proposes that every part of nature contains an **infinity** of **monads**. It was his understanding that space was a relation that led him to reject **Isaac Newton's** theory that space was an empty void container into which the objects of nature were placed. *See also* ATOMISTS; VACUUM AMONG FORMS.

**VACUUM AMONG FORMS (VACUUM FORMARUM).** Leibniz's law of **continuity**, which denies that there are gaps in **nature**, might be taken to imply that there could not be a "**vacuum** among forms," that is, that the differences between species and natural orders would be gradual. Sometimes he appears to hold that all the orders of natural being "form a single chain in which different kinds like so many links clasp one another so firmly that it is impossible for the senses and the imagination to fix the exact point where one begins or ends" (BC 558; W 187). Thus, as well as plants and **animals**, we might expect natural history one day to find an in-between order of "plant-animals." He even thought that, on some planet or other, it is quite likely that there are species intermediate between humans and (other)

animals, not to mention species that are superior to humans (*New Essays*, A VI vi 473).

Leibniz thus thought that the denial of a vacuum among forms was a good heuristic principle. But he did not subscribe to such a denial in general. Not all possible species will exist in the actual universe because they are not all compossible: some of them will not exist because they are not compatible with the **order** that **God** has chosen (A VI vi 307). A vacuum among forms turns out to pose a problem analogous to the problem of **evil** and one Leibniz sought to answer in the same way. Such a vacuum would appear to detract from the **plenitude** and therefore from the **perfection** of the **universe**. But, according to Leibniz, it does not actually do so because not all possibles can exist in any actual universe and not therefore in the most perfect universe.

**VAN HELMONT, FRANCIS MERCURY.** See HELMONT, FRANCIS MERCURY VAN.

**VINCULUM SUBSTANTIALE.** A phrase introduced by Leibniz in 1712 during his **correspondence** with the Jesuit teacher **Bartholomäus Des Bosses**. It means literally “substantial chain” (sometimes translated “substantial bond”). The question was whether there were composite **substances**, as Leibniz often said there were, or whether ordinary **material** things were no more than **aggregates** of the true substances or **monads**. A *vinculum substantiale* would be that by virtue of which ordinary material things would be true substances, albeit not simple ones like the monads. It is the “metaphysical chain” that links the dominant monad of a composite substance such as an **animal** or a human being and brings about a “union” of the monads involved. Scholars dispute whether the *vinculum substantiale* marks an important late change of direction in Leibniz’s philosophy or is merely a digression reflecting Leibniz’s attempt to take seriously the intellectual requirements of his Jesuit correspondent, which included an account of material substance consistent with the doctrine of **transubstantiation**.

**VIS VIVA.** See FORCE.

**VITALISM.** The view that the **universe** is permeated throughout by living things, that every thing in the universe is alive. Leibniz was

himself a vitalist. He held that, contrary to first appearances, “nothing is . . . dead in the universe” (*Monadology*, §69). His fundamental entities—his **monads**—were “living **mirrors**.” Leibniz found it necessary, however, to distance himself from those vitalists who held that there was an **arché** or **world soul** that needed to be invoked in order to explain **natural** phenomena. These vitalists were committed to opposing the **mechanistic** explanations of **Modern philosophers**. Leibniz objected to the appeal to spiritual principles in natural **science** as a *deus ex machina*. Nonetheless he was sympathetic to the vitalists, such as **Francis Mercury van Helmont**, **Henry More**, and **Anne Conway**, and claimed that his **system** could make sense of those, like them, “who put life and **perception** into everything” (A VI vi 72). Leibniz’s system does this by his proposal of a **double kingdom**, which allows for there to be **soul-like** things everywhere following the laws of **final causes** while the phenomena investigated in **physics** are entirely determined by efficient **causes**.

**VITAL PRINCIPLES AND PLASTIC NATURES, THOUGHTS ON (CONSIDÉRATIONS SUR LES PRINCIPES DE VIE ET NATURES PLASTIQUES)**. The short title of a paper written in the form of a letter to the editor of the *Histoire des Ouvrages des Savants* in 1705, when it was published; its full title is “Thoughts on Vital Principles and Plastic Natures, by the Author of the System of Preestablished Harmony” (GP vi 539–46; L 586–95). Leibniz had been asked to comment on a controversy between **Pierre Bayle** and Jean le Clerc about the notions of certain **vitalist** philosophers, including **Ralph Cudworth**’s “plastic natures.” This provided Leibniz with an opportunity to say both where he agreed with philosophers who appealed to vital principles and where he disagreed. He agreed that “vital principles are spread throughout all **nature** and are **immortal**, since they are indivisible **substances** or **unities**” (GP vi 539; L 586). He did not agree, however, that these vital principles change the course of **motion** in **bodies**. Moreover, he held that no **animal** is completely destroyed but is only **transformed**. Leibniz concluded his paper by stressing that, in his philosophy, “everywhere, at every time, and in every place things are just as they are here” (GP vi 546; L 590) and therefore that things that are remote or hidden could be understood by **analogy** with what is nearby and visible.

**VOID.** *See* VACUUM.

**VOLDER, BURCHARDIUS DE (1643–1709).** A Dutch associate of **Christiaan Huygens** and follower of **René Descartes**, de Volder was professor of **physics** and **mathematics** at the University of Leiden. He wrote on topics ranging from respiration to the **motion** of the Earth. Leibniz **corresponded** with him between 1698 and 1706, defending his **dynamics** and clarifying his underlying theory of **substance** (GP ii 141–283). *See also* BERNOULLI, JAKOB AND JOHANN.

**VOLUNTARISM.** A term used broadly to refer to a variety of views that place an emphasis on the **will**, typically the will of **God**. **Neoplatonic** views about the origin of the world as an **emanation** from the deity tend not to emphasize the will and for this reason they were often opposed by those who subscribed to the Judeo-Christian view of the origin of the world. Nonetheless many Christians, including Leibniz, found ways of accepting Neoplatonic ideas while still emphasizing the importance of God's **free will** in **creating the universe**. In this broad sense, Leibniz can be, and is, referred to correctly as a voluntarist.

There is a narrower sense, however, in which the term *voluntarist* is applied to those who say that something is good just because God wills it and who deny that there are any standards of goodness that are independent of God's will. Descartes had claimed that he was not prepared to say that God could not make  $1 + 2$  equal something other than 3. The truths that seem to us necessary, according to Descartes, do indeed seem so to us and we cannot think of them in any other way. But their truth is nonetheless dependent on God's will.

Leibniz was strongly opposed to this form of voluntarism, since it in effect reduced the **eternal truths** to something arbitrary. As he put it in his *Discourse on Metaphysics*:

If we say things are good by no rule of goodness beyond the will of God alone, we thoughtlessly destroy, I think, all the love and glory of God. For why praise him for what he has done if he would be equally praiseworthy for doing the opposite? Where will his **justice** and his **wisdom** be, if all that remains of him is some kind of despotic **power**, if his will takes the place of **reason**, and if, by the very definition of tyranny, what pleases the Almighty is ipso facto just? (§2)

Leibniz, in common with other admirers of **Plato** (who had discussed this problem in his *Euthyphro*, after which it is commonly named), wanted to say that there are eternally right conceptions of goodness and justice that philosophy aims to discover. That **Platonic** project is undermined as much by this kind of voluntarism as it is by relativism. *See also* *MEDITATION ON THE COMMON NOTION OF JUSTICE*.

**VON HESSEN RHEINFELS, ERNST.** *See* ERNST VON HESSEN RHEINFELS.

**VON ROSENROTH, CHRISTIAN KNORR (1636–1689).** Von Rosenroth was an advisor to the Court of Prince Christian August, Duke of Sulzbach, from 1668 until his death. Although a Lutheran all his life, his employer was a Catholic. Von Rosenroth was one of the chief architects of Christian **Kabbalah** in the 17th century, along with **Francis van Helmont** and **Anne Conway**. **Renaissance** Christian kabbalists, such as Pico della Mirandola, had believed that the kabbalistic work called the *Zohar* was a *prisca theologia* text—that it contained **wisdom** that had been revealed to Moses but which had not been set down in **Scripture**. Von Rosenroth subscribed to this, and to the idea that Kabbalah proved Christianity, in particular, the **truth** of the **Incarnation** and the **Trinity**.

In his main work, the *Kabbala denudata* (1677, 1684), von Rosenroth published his own Latin translations of kabbalistic texts, including sections from the *Zohar* and the later kabbalistic school of Isaac Luria. The *Kabbala denudata* was very influential and remained the principal non-Jewish source for Kabbalah until the end of the 19th century. In his translations, von Rosenroth juxtaposed passages from the New Testament, or provided a commentary, as a means for paralleling the two doctrines of Kabbalah and Christianity. Also included were essays by **Henry More** and works such as the *Cabbalistical Dialogue* and the *Adumbratio kabbalae christianae*, which were probably jointly penned by Helmont, Conway, and the Quaker George Keith.

Von Rosenroth's chief motive for his work was the belief that the sociopolitical conflict that had ravaged Europe could be ended by harmonizing the different religions. This interest in **church unity**

was an aim shared by Leibniz. Leibniz probably first met von Rosenroth in 1671, and they maintained a relationship until the latter's death. In January 1688 Leibniz visited him for about 10 days in Sulzbach, where he examined the *Kabbala denudata*, though most likely not in much detail. Though Leibniz never believed Christian Kabbalah contained any *prisca theologia*, he was interested in its more cosmological aspects, which displayed certain **Neoplatonic** concepts present in his own **metaphysics**.

– W –

**WACHTER'S "ELUCIDARIUS CABALISTICUS," REMARKS ON.**

This was first published by Foucher de Careil in 1854 as *Réfutation inédite de Spinoza par Leibniz*. Octavius Owen translated it into English in the following year as *A Refutation Recently Discovered of Spinoza by Leibniz*. The part dealing with **Benedict de Spinoza** is available in AG 272–81; for the remainder of Leibniz's comments, consult *Spinoza: Eighteenth- and Nineteenth-Century Discussions*, ed. Wayne I. Boucher (1999), 1:93–101. A critical edition has recently been published by Philip Beeley in *The Leibniz Review*.

J. G. Wachter was a philosopher and **theologian** versed in **Kabbalah**. His book of 1699, *Der spinozismus im Judenthumb*, had attacked the doctrines of Spinoza and Kabbalah for being **pantheistic**. But in *Elucidarius cabalisticus* of 1706, Wachter revised his opinion. He now sought to show how these two doctrines did indeed make a real distinction between **God and the world**. His book also provides an exposition of kabbalistic doctrine and seeks to demonstrate that it significantly influenced Spinoza's philosophy.

Leibniz read *Elucidarius cabalisticus* sometime after 1706. The remarks he makes are an important tool for comparing his **metaphysics** both with Spinoza's doctrine, especially with regard to the **relation** between God and the world, and also with kabbalistic writings, such as those of **Francis Mercury van Helmont** and **Anne Conway**.

Concerning Spinoza's proposition 17 of part 1 of *The Ethics*, Leibniz writes "that things follow from God, as properties from a triangle, is proved by no argument, nor is there an **analogy** between **essences**

and **existing** things” (*Leibniz Review* 12 [2002]: 10). It is precisely because, according to Leibniz, “things are possible in many ways,” that this actual **universe** of things is but one of an **infinity** of (**logically**) possible ones, that things are not deducible from the **ideas** of God with the necessity that the properties of a triangle follow from the conception of its essence. “The axiom that that which belongs to the essence of a thing is that without which it cannot exist nor be conceived, should be applied to necessary things or species, not to individuals or contingents. . . . Hence [contingents] have no necessary connection with God” (*Leibniz Review* 12 [2002]: 5–6). Leibniz is arguing that the things of this world are contingent; therefore their essences do not follow from—are not grounded in—the divine **substance**, and therefore they are their own substances, and Spinozism, or pantheism, is refuted.

**WEIGEL, ERHARD (1625–1699)**. Professor of **mathematics** at the University of **Jena**, Weigel was interested in the extension of mathematical ideas into other areas, including **metaphysics**. He was also the author of a book (*Analysis Aristotelica ex Euclide restituta*, 1658) in which he sought to reconcile the philosophy of the **ancients**, especially but not only **Aristotle**, with **Modern philosophy**. Leibniz spent a term studying under Weigel in 1663 and seems to have been much influenced by him. He seems to have been indebted to Weigel, for instance, for the **Pythagorean** idea that the world is to be understood in terms of number, which influenced his own metaphysics. He probably also owed to Weigel his attachment to the method of **Euclid**. Weigel was the first of his teachers to accept Modern philosophy and provided his pupil with one example of the kind of reconciliation of the old with the new philosophy that was to become a regular feature of Leibniz’s own work. *See also* ECLECTICISM; MONADODOLOGY.

**WELL-FOUNDED PHENOMENA (PHENOMENA BENE FUNDATA)**. A phenomenon that is neither a **substance** (one of the fundamental constituents of the **universe**) nor a mere illusion: an in-between category. Leibniz, in his later writings, treats rainbows as a paradigm of a well-founded phenomenon—well-founded because what we see when we see a rainbow has a basis in **nature** (light is passing through water particles, etc.) yet what we see is not itself one

of the basic constituents of the world. **Space**, **time**, and **matter** all count as well-founded phenomena for Leibniz. They are not substances, as some supposed, but, as Leibniz liked to put it, they are founded upon and so “result from” substances. *See also* PHENOMENALISM.

**WHAT IS INDEPENDENT OF SENSE AND MATTER, LETTER ON.** *See* SENSE AND MATTER, LETTER ON WHAT IS INDEPENDENT OF.

**WILL (VOLUNTAS/VOLITION).** To “will” is to desire the future realization of some particular state of affairs or event. To possess the “faculty of will” is to be able to **act** in order to bring about that state or event toward which one has an inclining desire: it is to act on one’s desire. According to Leibniz, **God’s** will, his desire, is to do what is best. This means that God is inclined to **create** and to create a world that is the best that can possibly be achieved. This act of creation is God’s own exercise of will because the determining inclination is grounded in his own **substance** alone, in his essential **attribute** of unlimited goodness. Such spontaneous acts of will are, Leibniz says, free.

Leibniz compares and contrasts the faculties of God and created **monads** thus:

This triad [of God’s **power**, **knowledge**, and will] corresponds in created **monads** to the subject or basis, the **perceptive** faculty and the **appetitive** faculty. But in God these attributes are absolutely **infinite** or **perfect**, while in the created monads . . . they are mere imitations. (Monadology, §48)

Every monad possesses appetite—desire, will—and since the appetite is determined by the **essence** of the monad itself (as conceived as a **complete concept** in God’s mind), the actions (changes of perceptions) that are inclined by the appetite are grounded in the monad’s *own* being. In this sense each monad possesses its own faculty of will—and this is free insofar as it is **spontaneous** and not grounded in another substance.

The succession of perceptions of a monad are brought about by its faculty of appetite. But in the same way that every perception is an accumulated representation of the *petites perceptions* of other mon-

ads about it, so every appetite or inclination of a monad is itself a representation of *petites* appetitions. A monad of the conscious or self-conscious type—a **soul** or a rational mind—will be sensibly aware of one or more of its inclinations. But each of these appetitions is but the sensible manifest tip of an iceberg of myriad unconscious wills. The different strata of monads represent different degrees of clarity of perception, including the extent to which the consequences of individual actions can be anticipated in relation to a particular desire. In the case of the rational mind monads, their clarity of perception extends as far as being “capable of knowing the system of the **universe**, and of imitating it to some extent” (*Monadology*, §83). Depending on their essential individual goodness, certain of these rational creatures “love and imitate, as is proper, the author of all good” and thus their will acts in order to “work for everything that seems in conformity with the **presumptive** or antecedent divine will” (*Monadology*, §90). *See also* FREE WILL; VOLUNTARISM.

**WISDOM (SAPIENTIA/SAGESSE).** Wisdom, for Leibniz, is the **knowledge** of how to achieve **happiness** or, more generally, a good outcome. Wisdom is one of God’s **attributes**, and God’s wisdom is the basis of Leibniz’s **optimism** about the world being governed by a principle of **fitness** and being therefore the best of all **possible worlds**. Humans are made in the **image of God**, for Leibniz, and so humans are also, in varying degrees, wise. Wisdom is, according to Leibniz, a very important quality for humans to cultivate. It calls for the **perfection** of the mind through knowledge of the principles of all the sciences. From this would follow knowledge of how to conduct oneself, how to preserve one’s health, and how to provide for the conveniences of living. Wisdom prompts us to be **charitable** to others, that is, to delight in the happiness of anyone else. *See also* ETHICS.

**WOLFF, CHRISTIAN (1679–1754).** Christian Wolff was, like Leibniz, a former student of **Erhard Weigel** at **Jena**. He corresponded with Leibniz (1704–1716) about a variety of topics, particularly **mathematics** but also **ethics** (which both conceived as independent of revealed religion) and **dynamics** (where he disputed the grounding Leibniz supposed it to have in **metaphysics**). Wolff was a university professor for nearly 50 years, first at Halle and, after being

sacked for suggesting that deserters should not be punished since they could not help acting as they did, later at Marburg. He developed aspects of Leibniz's thought into a distinctive **system** of his own, including a **monadology**. Wolff did not merely advocate a strict method of **demonstration** in philosophy but also sought to lay out his system according to the method of **geometry**. The Latin versions of his philosophy, such as his *Philosophia rationalis sive logica* (1728), established him as a major philosopher in his own right, and he was the leading philosopher in Germany between Leibniz and Immanuel Kant. *See also* REVELATION.

**WORLD SOUL (ANIMA MUNDI).** Leibniz accepted the view of the **Neoplatonists** and others that the world was thoroughly animated. However, he rejected the view commonly held by **vitalists** that there is a world soul. He insisted against the **Averroists** and others that the ultimate constituents of the world are individual **souls** that are “true unities” (or **monads**). In his *De summa rerum* he rejected the idea of a world soul on the ground that it would be a “being by **aggregation**” (and so not a true unity), which is impossible for a soul. He particularly opposed those, like the **quietists**, who denied the individuality of the soul and proposed that the individual soul is eventually absorbed into the soul of the world. Leibniz devoted a paper he wrote for Queen **Sophie-Charlotte** in 1702 to this topic, his *Reflections on the Doctrine of a Single Universal Spirit* (GP vi 529–38; L 554–60). *See also* MYSTICISM.

**WORLDS, PLURALITY OF.** *See* PLURALITY OF WORLDS.

**WORLDS, POSSIBLE.** *See* POSSIBLE WORLDS.

## Appendix: Leibniz's Main Philosophical Writings

References are to the best-known texts, with preference to those that are readily available. The first reference is to the original-language text, the second to an English translation. For each of Leibniz's works listed, there is a corresponding entry in the dictionary. Also, for each person whose correspondence with Leibniz is listed, there is a corresponding entry for that individual in the dictionary. The references are listed by subject and then chronologically.

### METAPHYSICS

- De summa rerum* (1675–1676): Included in A VI iii; G. H. R. Parkinson, ed. and trans., *G. W. Leibniz: "De summa rerum"; Metaphysical Papers, 1675–1676* (New Haven, Conn.: Yale University Press, 1992).
- Discourse on Metaphysics* (*Discours de métaphysique*) (1686): A VI iv 1529–88; Roger S. Woolhouse and Richard Francks, trans. and eds., *G. W. Leibniz: Philosophical Texts* (Oxford: Oxford University Press, 1998), 53–89.
- Correspondence with Arnauld* (1686–1690): GP ii 47–140; H. T. Mason, ed. and trans., *The Leibniz–Arnauld Correspondence* (Manchester, England: Manchester University Press, 1967).
- Critical Thoughts on the General Part of the Principles of Descartes* (*Animadversiones in partem generalem principiorum cartesianum*) (1692): GP iv 354–92; L 383–410.
- On the Reform of Metaphysics* (*De primae philosophiae emendatione*) (1694): GP iv 468–70; L 432–33.
- New System* (*Système nouveau*) (1695): GP iv 477–87; W 10–20.
- On the Radical Origination of Things* (*De rerum originatione radicali*) (1697): GP vii 302–08; AG 149–55.
- New Essays Concerning Human Understanding* (*Nouveaux essais sur l'entendement humain*) (1703–1704): A VI vi 44–527; Peter Remnant and Jonathan

- Bennett, trans. and eds., *G. W. Leibniz: New Essays on Human Understanding*, 2nd ed. (Cambridge: Cambridge University Press, 1996).
- Thoughts on Vital Principles and Plastic Natures (Considérations sur les principes de vie et sur les natures plastiques)* (1705): GP vi 538–45; L 586–90.
- Correspondence with Des Bosses* (1706–1716) GP ii 291–524; Donald Rutherford and Brandon Lock, trans. and eds., *The Leibniz–Des Bosses Correspondence* (New Haven, Conn.: Yale University Press, forthcoming).
- Remarks on Wachter’s “Elucidarius Cabalisticus” (Animadversiones ad Johann Georg Wachter)* (c. 1707): Philip Beeley, “Leibniz on Wachter’s *Elucidarius cabalisticus*: A Critical Edition of the So-Called ‘Refutation de Spinoza,’” *Leibniz Review* 12 (2002): i–viii; O. F. Owen, trans., *A Refutation Recently Discovered of Spinoza by Leibniz* (Edinburgh, 1855) (also partly in AG 272–81).
- Principles of Nature and Grace, Founded on Reason (Principes de la nature et de la grâce, fondés en raison)* (1714): GP vi 598–606; Woolhouse and Francks, *Leibniz: Philosophical Texts*, 258–66.
- Monadology, The* (1714): GP vi 607–23; Nicholas Rescher, *G. W. Leibniz’s “Monadology”: An Edition for Students* (London: Routledge, 1991).

## LANGUAGE, LOGIC, AND TRUTH

- On the Art of Combinations (De arte combinatoria)* (1666): A VI i 163–230; selections in L 73–82.
- Preface to an Edition of Nizolius (1670): A VI i 398–475; selections in L 121–30.
- Meditations on Knowledge, Truth, and Ideas (Meditationes de cognitione, veritate et ideis)* (1684): A VI vi 585–91; AG 23–27.
- General Investigations Concerning the Analysis of Concepts and Truths (Generales inquisitiones de analysi notionum et veritatum)* (1686): A VI iv 739–88; N. H. O’Briant, *Gottfried Wilhelm Leibniz’s “General Investigations Concerning the Analysis of Truths and Concepts”: A Translation and Evaluation* (Athens: University of Georgia Press, 1968).
- Primary Truths (Primae veritates)* (c. 1686): C 518–23; P 87–92.
- Letter on What Is Independent of Sense and Matter (Lettre touchant ce qui est indépendant des sens et de la matière)* (1702): GP vi 499–508; AG 186–92.

## PHYSICS AND MATHEMATICS

- New Physical Hypothesis (Hypothesis physica nova)* (1671): A VI ii 219–76; L 139–42 (part 1 only).

- Brief Demonstration of a Notable Error of Descartes (Brevis demonstratio erroris memorabilis Cartesii)* (1686): GM vi 117–23; L 296–302.
- Correspondence with the Bernoulli* (1687–1716): GM iii.
- A Specimen of Dynamics (Specimen dynamicum)* (1695): GM vi 234–54; Woolhouse and Francks, *Leibniz: Philosophical Texts*, 153–76.
- On Nature Itself (De ipsa natura)* (1698): GP iv 504–16; Woolhouse and Francks, *Leibniz: Philosophical Texts*, 209–22.
- Correspondence with Clarke* (1715–1716): GP vii 347–442; Ar.

## THEOLOGY AND PHILOSOPHY OF RELIGION

- Confession of Nature against the Atheists (Confessio naturae contra atheistas)* (1668): A VI i 489–93; L 109–13 (in part).
- Confession of a Philosopher (Confessio philosophi)* (1672–1673): A VI iii 116–49; Robert C. Sleigh Jr., ed. and trans., *Confessio Philosophi: Papers Concerning the Problem of Evil, 1671–1678* (New Haven, Conn.: Yale University Press, forthcoming).
- Examination of the Christian Religion, The (Examinatio christianae religionis)* (1686): A VI iv 2356–2455; C. W. Russell, ed. and trans., *System of Theology* (London: Burns & Lambert, 1850).
- Theodicy (Essais de théodicée)* (1710): GP vi 1–436; H.
- Discourse on the Natural Theology of the Chinese* (1716): D iv 169–210; H. Rosemont and Daniel J. Cook, trans. and eds., *Discourse on the Natural Theology of the Chinese* (Honolulu: University of Hawaii Press, 1977).

## ETHICS AND POLITICS

- New Method for Learning and Teaching Jurisprudence (Nova methodus discendae docendaeque jurisprudentiae)* (1667): A VI i 259–364; L 85–90 (selections only).
- Code of the Law of the Peoples (Codex juris gentium diplomaticus)* (1693): D IV iii 285–328 (preface only); R 165–76.
- Meditation on the Common Notion of Justice (Méditation sur la notion commune de la justice)* (c. 1702–03): M 41–70; R 45–64.



# Bibliography

## CONTENTS

I. Introduction	253
II. Editions of Leibniz's Writings	258
A. Original-Language Editions	258
B. English-Language Editions	260
III. Secondary Literature	262
A. Introductory and General Books on Leibniz's Philosophy	262
B. Biographical Works	263
C. General Historical Background	263
D. Writings on the Young Leibniz (1646–1676)	264
E. Development of Leibniz's Thought	265
F. Reception of Leibniz's Thought	266
G. Collections of Papers on Leibniz	266
H. Writings on Individual Topics	267
I. Writings on Individual Works by Leibniz	309
J. Leibniz's Correspondents and His Relations to Other Thinkers	314

## I. INTRODUCTION

### The Primary Literature: Leibniz's Own Writings

Only a small fraction of Leibniz's letters, essays, and drafts were published during his lifetime. He never threw anything away, however, and after his death a vast array of more than 50,000 papers was taken into care by the Royal Library of Hanover. Today most of this collection is housed in the Leibniz archive in Hanover at the Gottfried Wilhelm Leibniz Library, the federal state library of Lower Saxony. The contents of the archive have been described by Bodemann. His complete index of all Leibniz's manuscripts is in *Die Leibniz-Handschriften der Königlichen Öffentlichen Bibliothek zu Hannover*, ed. E. Bodemann (Hanover: Hahn, 1889; repr. Hildesheim: Georg Olms, 1966).

The index of Leibniz's correspondences is in *Der Briefwechsel des Gottfried Wilhelm Leibniz in der Königlichen Öffentlichen Bibliothek zu Hannover*, ed. E. Bodemann (Hanover: Hahn, 1895; repr. Hildesheim: Georg Olms, 1966).

In 1768 Ludovici Dutens published his six-volume edition *G. G. Leibnitii . . . Opera Omnia*. The six volumes contain (I) theology; (II) philosophy, including physics, chemistry and medicine; (III) mathematics and dynamics; (IV) Chinese history and philosophy, and documents intended for his history of the House of Brunswick; (V) diplomatic correspondence; and (VI) philological correspondence and etymology. Dutens's edition remains to this day the only complete representation of the whole span of Leibniz's thought.

From 1849 to 1863 Carl Gerhardt published his seven-volume *Leibnizens Mathematische Schriften*, which includes dynamics, and from 1875 to 1890 he published *Die Philosophische Schriften von Gottfried Wilhelm Leibniz*, also in seven volumes, which is still the most extensive collection of Leibniz's philosophical work.

In 1900 the academies of Prussia and France agreed to collaborate on a major project that would see the entire Leibnizian corpus brought into print. Though the project did not survive World War I as a joint venture, it was continued by the Prussian Academy on its own. In 1923 the first volume of *G. W. Leibniz: Sämtliche Schriften und Briefe* appeared, though work was again interrupted during World War II. Today, under the auspices of the German Academy of Sciences, some 38 volumes have so far been published. Nevertheless, it may well be more than a hundred years before the project is finished.

*G. W. Leibniz: Sämtliche Schriften und Briefe* is divided into eight series or categories of Leibniz's writings. Within each of these series, individual volumes are being published in chronological order. The series are (with their present state of advancement):

- I. General, political, and historical correspondence (up to vol. 18: 1700)
- II. Philosophical correspondence (up to vol. 1: 1685)
- III. Mathematical, scientific, and technical correspondence (up to vol. 6: 1696)
- IV. Political writings (up to vol. 5: 1694)
- V. Historical writings (no volumes yet published)
- VI. Philosophical writings (up to vol. 4: 1690, plus vol. 6: *New Essays*)
- VII. Mathematical, scientific, and technical writings (up to vol. 3: 1676)
- VIII. Natural science, medical, and technical writings (no volumes yet published)

In addition to series II and VI, there is much of philosophical relevance to be found in other series as well. Some of these volumes are available on the internet—for details of the website, see below.

Until the German Academy edition is complete, the student of Leibniz must additionally consult the editions by Dutens and Gerhardt mentioned above. A concordance exists for accessing the philosophical works in Gerhardt: *Leibniz-Lexicon: A Dual Concordance to Leibniz's "Philosophische Schriften,"* ed. Reinhard Finster et al. (Hildesheim: Olms, 1988).

Two further important and more recent collections deserve to be singled out: Louis Couturat's *Opuscles et fragments inédits de Leibniz*, for philosophy, mathematics, and physics; and Gaston Grua's *G. W. Leibniz: Textes inédits d'après les manuscrits de la Bibliothèque provinciale d'Hanovre*, for theology and ethics.

In the "Original-Language Editions" section of the bibliography, full details are given of the editions of the collected works mentioned here, along with other useful editions. Single works of Leibniz that have been published individually, including his correspondences, are listed separately.

Much of what Leibniz wrote was in Latin and French, with only a small amount in German. In English translation, the largest collection is Leroy Loemker's *G. W. Leibniz: Philosophical Papers and Letters*. The best student editions are Roger Ariew and Daniel Garber's *G. W. Leibniz: Philosophical Essays* and G. H. R. Parkinson's *Leibniz: Philosophical Writings*. Leibniz's political thinking in English translation is to be found in Patrick Riley's *The Political Writings of Leibniz*. Although most of Leibniz's celebrated philosophical works are now available in English, what has been translated of his complete corpus is no more than the tip of an iceberg. In the "English-Language Editions" section of the bibliography, we list all the important collections, as well as the single works and correspondences that have been published individually.

## The Secondary Literature: Scholarly Works on Leibniz

The secondary literature on Leibniz is extensive. We have arranged it in 10 sections. The first seven are more general. They are: (1) introductory and general; (2) biographical; (3) general historical background; (4) on the young Leibniz; (5) development of his thought; (6) reception of his thought; and (7) collections of papers on Leibniz. The last three sections relate to specific topics that find entries in the dictionary. We have separated the scholarship here into three kinds: (8) on individual topics; (9) on individual works by Leibniz; and (10) on Leibniz and other thinkers. Thus the bibliography should suggest what might be read by those wishing to pursue particular topics further. The topics interrelate in all sorts of ways, as happens particularly in philosophy, and only some of the links to other headings are indicated. Some of the headings have a provenance in Leibniz's own writings but we have not hesitated to use others

(such as “monadology” and “phenomenalism”) whose provenance is in the subsequent literature.

The bibliography is selective and we have given priority to works in English. However, items in languages other than English have been included where they are important or where the resources in English are lacking. Priority is also given to recent scholarship, though again older works are included where they are still considered to be of importance.

Some of the works cited appear in larger works listed elsewhere in this bibliography. For ease of cross-reference, the larger works are also listed below:

- Amaladass, Anand, ed. *Essays on Leibniz: 350th Birthday Commemorative Volume*. Chennai, India: Satya Nilayam, 1997. Cited as Amaladass, *Essays on Leibniz*.
- Brown, Stuart. *The Young Leibniz and His Philosophy, 1646–1676*. Dordrecht, Netherlands: Kluwer Academic, 1999. Cited as Brown, *Young Leibniz*.
- Chappell, Vere, ed. *Gottfried Wilhelm Leibniz*. Vol. 12 of *Essays on Early Modern Philosophers from Descartes and Hobbes to Newton and Leibniz*. 2 parts. New York: Garland, 1992. Cited as Chappell, *Leibniz*.
- Coudert, Allison P., Richard H. Popkin, and Gordon M. Weiner, eds. *Leibniz, Mysticism and Religion*. Dordrecht, Netherlands: Kluwer, 1998. Cited as Coudert et al., *Mysticism and Religion*.
- Dascal, Marcelo, and Elhanan Yakira, eds. *Leibniz and Adam*. Tel Aviv: University Publishing Projects, 1993. Cited as Dascal and Yakira, *Leibniz and Adam*.
- Frankfurt, Harry G., ed. *Leibniz: A Collection of Critical Essays*. New York: Anchor Books, 1972. Cited as Frankfurt, *Critical Essays*.
- Heinekamp, Albert, ed. *Internationaler Leibniz-Kongreß: Vorträge*. Hanover: Gottfried-Wilhelm-Leibniz-Gesellschaft. Vol. 5, *Leibniz: Tradition und Aktualität*, 1988; vol. 6, *Leibniz und Europa*, 1994. Cited as Heinekamp, *Vorträge*.
- Hooker, Michael, ed. *Leibniz: Critical and Interpretive Essays*. Minneapolis: University of Minnesota Press, 1982. Cited as Hooker, *Interpretive Essays*.
- Jolley, Nicholas, ed. *The Cambridge Companion to Leibniz*. Cambridge: Cambridge University Press, 1995. Cited as Jolley, *Cambridge Companion*.
- Kulstad, Mark, ed. *Essays on the Philosophy of Leibniz*. Rice University Studies 63, no. 4 (Houston: William Marsh Rice University, 1977). Cited as Kulstad, *Essays*.
- Leclerc, Ivor, ed. *The Philosophy of Leibniz and the Modern World*. Nashville, Tenn.: Vanderbilt University Press, 1973. Cited as Leclerc, *Modern World*.
- Lodge, Paul, ed. *Leibniz and His Correspondents*. Cambridge: Cambridge University Press, 2004. Cited as Lodge, *Correspondents*.

- Okruhlik, K., and J. R. Brown, eds. *The Natural Philosophy of Leibniz*. Dordrecht, Netherlands: Reidel, 1985. Cited as Okruhlik and Brown, *Natural Philosophy*.
- Poser, Hans, ed. *Nihil sine ratione: Mensch, Natur und Technik im Wirken von G. W. Leibniz*. Vol. 7 of *Internationaler Leibniz-Kongreß: Vorträge*. Hanover: Gottfried-Wilhelm-Leibniz-Gesellschaft, 2001. Cited as Poser, *Nihil sine ratione*.
- Racionero, Quintin, and Concha Roldán, eds. *G. W. Leibniz: Analogía y expresión*. Madrid: Editorial Complutense, 1994. Cited as Racionero and Roldán, *Analogía*.
- Wilson, Catherine. *Leibniz*. Dartmouth, N.H.: Ashgate, 2001. Cited as Wilson, *Leibniz*.
- Woolhouse, Roger S., ed. *Gottfried Wilhelm Leibniz: Critical Assessments*. London: Routledge, 1994. Cited as Woolhouse, *Critical Assessments*.
- . *Leibniz: Metaphysics and Philosophy of Science*. Oxford: Oxford University Press, 1981. Cited as Woolhouse, *Metaphysics*.
- . *Leibniz's "New System" (1695)*. Florence: Olschki, Lessico Intellettuale Europeo, 1996. Cited as Woolhouse, *Leibniz's "New System."*

## Bibliographies, Journals, and Websites

A bibliography, *Bibliographie des oeuvres de Leibniz*, edited by Émile Ravier (Paris: Librairie Félix Alcan, 1937; repr. Hildesheim: Olms, 1966), lists all of Leibniz's writings that were published during his lifetime and posthumously, up to 1935. For each of the editions of Leibniz's collected writings, Ravier itemizes the contents.

An ongoing bibliography is being published under the auspices of the Leibniz Gesellschaft. It is based on the annual and continuing bibliographies published in the key international quarterly journal of Leibniz studies, *Studia Leibnitiana*. However, it is by no means exhaustive. Volume 1 *Leibniz-Bibliographie: Die Literatur über Leibniz bis 1980*, ed. Kurt Müller and Albert Heinekamp (2nd ed., Frankfurt am Main: Klostermann, 1983), lists scholarship published up to 1980; volume 2 updates the list through 1990: *Leibniz-Bibliographie: Die Literatur über Leibniz, 1981–1990*, ed. Albert Heinekamp and Marlen Mertens (Frankfurt am Main: Klostermann, 1996).

In addition to *Studia Leibnitiana*, another good source of new books is the annual journal *The Leibniz Review*. This is sponsored by the Leibniz Society of North America and contains full discussions of the literature at the cutting edge of Leibniz scholarship.

The website of the Leibniz archive in Hanover ([www.nlb-hannover.de](http://www.nlb-hannover.de)) includes an online bibliography of scholarship that runs from 1991. Publications

can be searched by author name and title keywords. A very good online bibliography of the secondary literature is available on Gregory Brown's website ([www.hfac.uh.edu/gbrown/philosophers/leibniz](http://www.hfac.uh.edu/gbrown/philosophers/leibniz)). Works are grouped in years, and a search facility is available.

The website [www.leibniz-edition.de](http://www.leibniz-edition.de) provides up-to-date news on the progress of the German Academy of Science's *G. W. Leibniz: Sämtliche Schriften und Briefe*. Those volumes, which are now available via the Internet, are accessible from here. Also available are online concordances between the *Sämtliche Schriften und Briefe* and some of the other major editions, including Gerhardt's.

A large number of English translations of Leibniz's essays and letters, not published elsewhere, can be accessed on Lloyd Strickland's website ([www.leibniz-translations.com](http://www.leibniz-translations.com)). Finally, there is a general site on Leibniz, run by Markku Roinila ([www.helsinki.fi/~mroinila/frames\\_index.htm](http://www.helsinki.fi/~mroinila/frames_index.htm)), which is a useful place to begin exploring Leibniz on the Internet.

## II. EDITIONS OF LEIBNIZ'S WRITINGS

### A. Original-Language Editions

#### *Single Works*

Beval, Yvon, ed. *G. W. Leibniz: Confessio philosophi: La profession de foi du philosophe; Texte, traduction et notes*. Paris: Vrin, 1961.

Foucher de Careil, Alexandre, ed. *Refutation inédite de Spinoza par Leibniz*. Paris, 1854.

Lestienne, Henri, ed. *Leibniz: Discours de métaphysique*. Paris: Vrin, 1907.

Robinet, André. *G. W. Leibniz: Principes de la nature et de la grâce fondés en raison; Principes de la philosophie ou Monadologie*. 3rd ed. Paris: Presses Universitaires de France, 1986.

Scheidt, Christian Ludwig, ed. *G. W. Leibniz: Protogaea*. Göttingen, 1749.

#### *Correspondence*

Gerhardt, Carl I., ed. *Briefwechsel zwischen Leibniz und Christian Wolff*. Halle: H. W. Schmidt, 1860; repr. Hildesheim: Olms, 1963.

———. *Der Briefwechsel von Gottfried Wilhelm Leibniz mit Mathematikern*. Berlin, 1899; repr. Hildesheim: Olms, 1962.

Grotendorf, C. L., ed. *Briefwechsel zwischen Leibniz, Arnauld und dem Landgrafen Ernst von Hessen-Rheinfels*. Hanover, 1846. (Includes first appearance of *Discours de métaphysique*.)

- Haase, Rudolf von, ed. *Der Briefwechsel zwischen Leibniz und Conrad Henfling*. Frankfurt am Main: Klostermann, 1982.
- Klopp, O., ed. *Correspondenz von Leibniz mit Caroline*. Hanover: Klindworth, 1884; repr. Hildesheim: Olms, 1973.
- . *Correspondenz von Leibniz mit der Prinzessin Sophie*. Hanover: Klindworth, 1873; repr. Hildesheim: Olms, 1970.
- . *Correspondenz von Leibniz mit Sophie Charlotte, Königin an Preussen*. Hanover: Klindworth, 1877; repr. Hildesheim: Olms, 1970.
- Rommel, Christian von, ed. *Leibniz und Landgraf Ernst von Hessen-Rheinfels, ein ungedruckter Briefwechsel über religiöse und politische Gegenstände*. Frankfurt am Main, 1847.
- Widmaier, R., ed. *Leibniz Korrespondiert mit China*. Frankfurt am Main: Klostermann, 1990.

#### *Collections of Leibniz's Writings*

- Buchenau, A., and E. Cassirer, eds. *Hauptschriften zur Gründung der Philosophie*. Leipzig, 1924.
- Couturat, Louis, ed. *Opuscules et fragments inédits de Leibniz*. Paris: Alcan, 1903; repr. Hildesheim: Olms, 1961. (Contains important works on metaphysics and logic.)
- Dutens, Ludovici L., ed. *G. G. Leibnitii . . . Opera Omnia*. 6 vols. Geneva, 1768; repr. Hildesheim: Olms, 1989. (Important resource covering full range of Leibniz's interests.)
- Erdmann, J. E., ed. *God. Guil. Leibnitii Opera Philosophica quae exstant Latina, Gallica, Germanica omnia*. Berlin: Eichler, 1839–1840; repr. Aalen: Scientia Verlag, 1974.
- Foucher de Careil, A., ed. *Lettres et opuscules inédits de Leibniz*. Paris, 1854; repr. Hildesheim: Georg Olms, 1975.
- . *Nouvelles lettres et opuscules inédits de Leibniz . . .* Paris: Durand, 1857; repr. Hildesheim: Olms, 1971.
- Gerhardt, Carl I., ed. *Die Philosophischen Schriften von Gottfried Wilhelm Leibniz*. 7 vols. Berlin: Weidmann, 1875–1890; repr. Hildesheim: Olms, 1965. (Very useful scholarly edition of the philosophical writings.)
- . *Leibnizens Mathematische Schriften*. 7 vols. Berlin: A. Asher; Halle: H. W. Schmidt, 1849–1863; repr. Hildesheim: Olms, 1965. (Important source for works on mathematics and dynamics.)
- German Academy of Sciences (auspices). *G. W. Leibniz: Sämtliche Schriften und Briefe*. Berlin: Akademie Verlag, 1923–. (Referred to by series and volume number; see introduction to bibliography.)

- Grua, Gaston, ed. *G. W. Leibniz: Textes inédits d'après les manuscrits de la Bibliothèque provinciale d'Hanovre*. Paris: Presses Universitaires de France, 1948. (Contains writings on theology and ethics.)
- Guhrauer, G. E., ed. *Leibniz's Deutsche Schriften*. 2 vols. Berlin: Veit, 1838–1840. (Leibniz's German writings.)
- Klopp, Otto, ed. *Die Werke von Leibniz*. 11 vols. Hanover: Klindworth, 1864–1884.
- Mollat, G., ed. *Mittheilungen aus Leibnizens ungedruckten Schriften*. Leipzig: H. Haessel, 1893.
- . *Rechtsphilosophisches aus Leibnizens Ungedruckten Schriften*. Leipzig, 1885.
- Pertz, G. H., ed. *Leibnizens gesammelte Werke*. 4 vols. Hanover, 1843–1847.
- Raspe, R. E., ed. *Oeuvres philosophiques latines et françoises de feu M. Leibniz*. 7 vols. Amsterdam, 1765. (First major edition of Leibniz's philosophical writings and the first publication of the *New Essays*.)
- Robinet, A., ed. *Principes de la nature et de la grâce fondés en raison, et Principes de la philosophie ou monadologie*. 3rd ed. Paris: Presses Universitaires de France, 1986.

## B. English-Language Editions

### *Single Works (Including En-Face Editions)*

- Beeley, Philip. "Leibniz on Wachter's *Elucidarius cabalisticus*: A Critical Edition of the So-Called 'Refutation de Spinoza.'" *Leibniz Review* 12 (2002): i–viii.
- Garber, Daniel, and Roger Ariew, eds. and trans. *Discourse on Metaphysics, and Other Essays*. Indianapolis: Hackett, 1991.
- Huggard, E. M., trans. *Theodicy: Essays on the Goodness of God, the Freedom of Man, and the Origin of Evil*. London: Routledge & Kegan Paul, 1951.
- Langley, Alfred G., ed. *New Essays Concerning Human Understanding*. New York: Macmillan, 1896; 2nd ed., 1916.
- Latta, Robert, trans. and ed. *Leibniz: The Monadology, and Other Philosophical Writings*. London: Oxford University Press, 1898.
- Martin, R. Niall D., and Stuart Brown, eds. and trans. *G. W. Leibniz: Discourse on Metaphysics, and Related Writings*. Manchester, England: Manchester University Press, 1988.
- O'Briant, W. H. *Gottfried Wilhelm Leibniz's General Investigations Concerning the Analysis of Truths and Concepts*. Athens: University of Georgia Press, 1968.
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- Remnant, Peter, and Jonathan Bennett, trans. and eds. *G. W. Leibniz: New Essays on Human Understanding*. 2nd ed. Cambridge: Cambridge University Press, 1996.
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- Russell, C. W., ed. and trans. *System of Theology*. London: Burns & Lambert, 1850.
- Sleigh, Robert C., Jr., ed. and trans. *Confessio Philosophi: Papers Concerning the Problem of Evil, 1671–1678*. New Haven, Conn.: Yale University Press, forthcoming.

### *Correspondence*

- Alexander, H. G., ed. *The Leibniz–Clarke Correspondence*. Manchester, England: Manchester University Press, 1956; repr. 1976.
- Ariew, Roger, ed. *G. W. Leibniz and Samuel Clarke: Correspondence*. Indianapolis, Ind.: Hackett, 2000.
- Mason, H. T., ed. and trans. *The Leibniz–Arnauld Correspondence*. Manchester, England: Manchester University Press, 1967.
- Rutherford, Donald, and Brandon Lock, trans. and eds. *The Leibniz–Des Bosses Correspondence*. New Haven, Conn.: Yale University Press, forthcoming.

### *Collections of Leibniz's Writings (Including En-Face Editions)*

- Ariew, Roger, and Daniel Garber, trans. and eds. *G. W. Leibniz: Philosophical Essays*. Indianapolis, Ind.: Hackett, 1989.
- Arthur, Richard, ed. and trans. *The Labyrinth of the Continuum: Writings on the Continuum Problem, 1672–1686*. New Haven, Conn.: Yale University Press, 2002.
- Child, J. M., trans. and ed. *The Early Mathematical Manuscripts of Leibniz*. London: Open Court, 1920.
- Cook, Daniel J., and Henry Rosemont Jr., eds. and trans. *Leibniz: Writings on China*. Chicago: Open Court, 1994.
- Duncan, G. M., trans. and ed. *G. W. Leibniz: Works*. 2nd ed. New Haven, Conn.: Tuttle, Morehouse and Taylor Co., 1908.
- Frankfurt, Harry G., ed. *Leibniz: A Collection of Critical Essays*. New York: Anchor Books, 1972.
- Loemker, Leroy E., ed. and trans. *G. W. Leibniz: Philosophical Papers and Letters*. 2nd ed. Dordrecht, Netherlands: Reidel, 1969.

- Parkinson, G. H. R., ed. and trans. *G. W. Leibniz: "De Summa Rerum"; Metaphysical Papers, 1675–1676*. New Haven, Conn.: Yale University Press, 1992.
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- Poser, H., and A. Heinekamp, eds. *Leibniz in Berlin*. Stuttgart: Franz Steiner, 1990.
- Riley, Patrick, ed. and trans. *The Political Writings of Leibniz*. Cambridge: Cambridge University Press, 1972; 2nd ed., 1988.
- Schrecker, P., and A. Martin, trans. and eds. *Monadology, and Other Philosophical Essays*. Indianapolis, Ind.: Bobbs-Merrill, 1965.
- Wiener, Philip, ed. *Leibniz Selections*. New York: Charles Scribners, 1951.
- Woolhouse, Roger S., and Richard Francks, trans. and eds. *G. W. Leibniz: Philosophical Texts*. Oxford: Oxford University Press, 1998.
- . *Leibniz's "New System" and Associated Contemporary Texts*. Oxford: Clarendon Press, 1997.

### III. Secondary Literature

#### A. Introductory and General Books on Leibniz's Philosophy

- Belaval, Yvon. *Leibniz: Initiation à sa philosophie*. Paris: Vrin, 1962.
- Broad, Charles D. *Leibniz: An Introduction*. Cambridge: Cambridge University Press, 1975.
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**Stuart Brown** (Ph.D., London University) was, until his retirement, professor of philosophy at the Open University, where he was recently elected an emeritus professor. He previously taught at the universities of St. Andrews and London, as well as at the University of California at Santa Barbara. Dr. Brown has been interested in Leibniz's philosophy for nearly 40 years. During that time he has written two books on Leibniz's philosophy: one for students at the Open University; the other, an interpretation for scholars as well as general readers in the *Philosophers in Context* series. He has also written numerous articles on Leibniz and other aspects of 17th- and 18th-century philosophy. He edited and translated, with R. Niall D. Martin, Leibniz's *Discourse on Metaphysics, and Related Writings*. He has edited a number of collections of original papers, including *Philosophers of the Enlightenment*, *Malebranche: His Critics and Successors*, and *The Young Leibniz and His Philosophy (1646–1676)*. He was general editor of the *Dictionary of Twentieth-Century British Philosophers*. Dr. Brown's other interests include philosophy of religion, and he is currently engaged in writing a monograph on *Leibniz's Philosophical Theology*.

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