

was ordained (1843). With the encouragement of his religious superiors, he remained in Louvain and continued the bibliography of writings by Jesuits published by Pedro de Ribadeneira in 1608 and 1613, by Philippe de Alegambe in 1643, and by Nathaniel Southwell in 1676. With the help of his brother Alois (1823–83) from 1850, he published *Bibliothèque des écrivains de la Compagnie de Jésus* (7 v. 1853–61). With Charles Ruelens he edited *Annales Plantiniennes depuis la fondation de l'imprimerie jusqu' à la mort de Christophe Plantin* (1865–66). Aided by Carlos Sommervogel he published a second edition of his *Bibliothèque* (3 v. 1869–76), which contained 11,000 names of Jesuit writers, together with information about their lives, works, editions, translations, manuscripts, etc. After the death of the De Backer brothers, Sommervogel continued the work.

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[M. DIERICKX]

BACON, DAVID WILLIAM

First bishop of Portland, Maine; b. Brooklyn, N.Y., Sept. 15, 1813; d. New York City, Nov. 5, 1874. He was the son of William and Elizabeth (Redmond) Bacon. After study at the Sulpician College, Montreal, Canada, and Mt. St. Mary's Seminary, Emmitsburg, Md., he was ordained by Archbishop Samuel Eccleston on December 13, 1838. Following parish assignments in northern New York and in New Jersey, he was sent to Brooklyn to organize the new parish of the Assumption of Our Lady, where he was pastor from 1841 to 1855. He was appointed bishop of Portland, and was consecrated by Archbishop John Hughes in St. Patrick's Cathedral, New York City, on April 22, 1855. His diocese, which included Maine and New Hampshire, was aided by Jesuits who served Catholics in central Maine and by priests from Quebec, Canada, who ministered to Franco-Americans in northern Maine. Educational and charitable needs were met by the Sisters of Mercy, who established their first house in Manchester, N.H. (1858), and extended their work in Maine to Bangor (1865), Whitefield (1871), and Portland (1873). Bacon was a notable pulpit orator. He built the Cathedral of the Immaculate Conception, and he attended Vatican Council I. By the time of his death, his diocese possessed 52 priests, and its Catholic population, mainly Irish-Americans and Franco-Americans, had doubled to about 80,000.



Sir Francis Bacon.

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[W. L. LUCEY]

BACON, FRANCIS

Statesman and philosopher, b. London, Jan. 22, 1561; d. London, April 9, 1626. He was educated in the classics at Cambridge and in law at Gray's Inn. He sought and obtained public offices in range from that of member of Parliament to the lord chancellorship, and became a knight, Baron Verulam, and Viscount St. Albans. Another object of Bacon's ambition was the reform of human learning through the advancement of a nontraditional, anti-Aristotelian philosophy. This undertaking was impeded by large expenditures of time on political and legal tasks. Of the 30-odd writings on philosophical and scientific topics that were begun, only seven were developed sufficiently for publication by the author. These are the *Advancement of Learning* (1605) and a Latin version with amendments of the same (1623), critical examinations of "ancient" opinions, disputational practices, and "bookish" preoccupations within the universities; *De sapientia veterum* (1609), a statement by way of interpretation of poetic fables of the basic principles of a natural-

istic philosophy; *Novum organum* (1620), a confessedly incomplete description of a “new logic” of induction; and, hastily compiled in the last years of the author’s life, three inconclusive works on natural history.

Sciences and Causes. In expounding his “new philosophy” Bacon rejects Aristotle’s classification of independent sciences with their several segregating axioms. He refuses to separate physics or the science of nature from knowledge in the arts, and denies mathematics an independent status. He also transfers certain of Aristotle’s metaphysical and ethical subjects, including the being and the nature of God on the one hand and the governing rules for human conduct on the other, to the province of revealed theology. The base of Bacon’s own scheme of science, or philosophy, is natural history; above this in a “pyramid” of knowledge lies physics, and at the apex metaphysics or universal physics. Physics contains the more limited axioms or principles of causal explanation, and metaphysics the more general. The primary task of science, for Bacon, is the discovery of forms, the components of and the causes within the particulars of nature. These forms are inseparable from matter, which is itself formed, active, and causal. All natural causes, then, are material causes—there are no final causes in nature.

Induction and Axioms. The sole method for discovering forms is an induction that relies on a constant and perpetual adduction of particulars. This induction begins with particulars sorted within natural history, in a preliminary response to a query put, as a “prenotion,” to nature, and ascends through the less inclusive to the more general axiom. It proceeds by the examination of three sorts of instance, those of “presence,” of “absence,” and of “deviation.” The first or affirmative sort are examples in which the form or cause or nature under investigation is present—form, cause, and nature are, for Bacon, convertible terms. The second or negative sort of instances are examples from which the form is lacking. The third are examples that manifest severally varied degrees of the form’s activity—the degrees of deviation, comparable to deflection in the compass needle, being dependent upon the operations severally of other conjunct forms, as causes, within the particulars under observation and experiment. The negative instances, long disregarded in inductive theory, are of especial consequence because of their agency in refuting such misleading axioms as may be too hastily derived from an examination of positive instances alone.

All axioms, whether suggested by particulars or by lesser axioms, are established through sense observation. No explanation that asserts a wider range of causation within particulars than testing by experiments can verify

is ever to be deemed true; and always it is sense that must try the experiment. There is to be no adding to the content of science by the employment of deductive, syllogistic devices or through the introduction, at any stage, of so-called “first principles.” The most general or metaphysical axioms or principles of science are inductive pronouncements upon causal operation within the whole of nature. And since whatever in science is cause is also in nature operation, metaphysical knowledge enables the scientist to produce inventions in great array for the “relief of man’s estate”; and this, indeed—and not Aristotle’s “meditation”—is both the supreme warranty and the final goal of inductive metaphysics.

Evaluation. Because of his stress on induction Bacon has often been hailed as the “prophet” of “experimental discovery.” He has provided, also, an example for those who would equate the findings of experimental science with the principles of metaphysics; but few of his followers in this regard have thought it possible to establish or to pursue a science of physical nature, let alone an ontology, by the sole use of his inductive method. Bacon’s philosophy has long been recognized as a definite antithesis to Aristotelianism. Certainly the two are opposites that do not readily lend themselves either to compromise or to transformation within a synthesis.

See Also: INDUCTION; FIRST PRINCIPLES; PHILOSOPHY, HISTORY OF.

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[F. H. ANDERSON]

BADIA, TOMMASO

Theologian and cardinal; b. Modena, 1493 (1483?); d. Rome, Sept. 6, 1547. He was a Dominican from the province of Lombardy, a brilliant professor in Ferrara, Venice, and Bologna, and Master of the Sacred Palace. Badia was strict in condemning heterodoxy but lenient with regard to persons. From 1536 he belonged to the reform group of Cardinal Gasparo CONTARINI. He endorsed the *Consilium de emendanda ecclesia* and the *Consilium quattuor delectorum* in 1537, and became a member of the commission for the proposed council at Mantua. Paul III approved the Society of Jesus in 1539 on his recom-