

Lawrence Nolan, ed. *The Cambridge Descartes Lexicon*. Cambridge University Press 2015. 778 pp. \$180.00 USD (Hardcover ISBN 9780521193528).

This extensive volume is devoted to the so-called founder of modern philosophy, that is to say the French philosopher René Descartes (1596-1650). It is not a comprehensive book on the more general aspects of Descartes' philosophy or a classical philosophical dictionary, but rather a reference source for scholars and students who would like to analyze the works and all the key-concepts of the French philosopher. *The Cambridge Descartes Lexicon* acts as a dictionary of Descartes' philosophical and scientific works, but at the same time it is also something more—because all the key-concepts of the *Lexicon*, written by several leading international scholars, seem to be proper essays. In fact, as Nolan says in the *Introduction and Notes on How to Use This Work*, the *Cambridge Descartes Lexicon* 'is more like an encyclopedia or a compendium than a traditional dictionary, both in its scope and content. [...] Most of the subject entries are also "scholarly" in the sense that they introduce readers to debates in the secondary literature. The authors of these entries sometimes present these debates without defending their own views, but in many cases they take an interpretative stand' (xxv).

The group of scholars who contributed to 149 the subject entries of the volume is impressive, that is to say 92 scholars from ten countries. It must also be said that the *Descartes Lexicon* includes 107 intellectual biographies of all the main intellectual figures who officially reacted to Descartes' work *Meditations*, that is to say Arnauld, Gassendi and Hobbes, but also contemporaries and immediate successors as Leibniz, Locke, Newton, and Spinoza. The volume contains as well intellectual biographies of medieval and scholastic predecessors as Augustine, Aquinas, Eustachius, Scotus, Suárez, and even important correspondents as Princess Elisabeth, Constantine Huygens and Mersenne or followers like Desgabets and Régis.

The editor of the volume, Lawrence Nolan, author of several essays and books on Descartes, opens the volume with a detailed and useful biographical note on Descartes entitled *Descartes' Life and Works*, where the French thinker is presented as a kind of anti-Aristotle of modern philosophy. In fact, what Descartes did was to destroy the base of Aristotelian-Scholastic philosophy, first of all by refusing its syllogistic logic. According to Descartes, even though classical logic was able to deduce with certainty the consequences of premises, it says nothing about the way one can identify the truth of these premises (on this topic see the entry *Syllogism* by Al Spangler and Lawrence Nolan, 709-711). Furthermore, since according to Aristotle 'essences constitute the first principle of the sciences, definitions play a key role in his epistemology and in syllogistic reasoning,' but as Nolan says in the entry entitled *Definition*, Descartes 'is very suspicious of this entire tradition, expressing three related criticisms of philosophical definitions: they obscure concepts that are already clear and distinct, tend to be vacuous, and fail to advance our knowledge' (187).

From that point of view the only science that is able to overcome these three criticisms is mathematics (see the entry entitled *Mathematics* by David Rabouin, 470-475), just because it features certainty (see the entry entitled *Certainty* by Katherine Morris, 100-103) and evidence, so it is clear that the problem of knowledge, in Descartes' philosophy, is priority (as the German philosopher Ernst Cassirer upheld in his famous 1899 work on Descartes). According to Descartes mathematics is the discipline where reason (see the entry entitled *Reason* by Charles Larmore, 636-639) is employed in its most pure and truthful way, and that is why it must be applied to all the objects of knowledge. These aspects of Descartes' critique of Aristotelian-Scholastic philosophy can be found not only in his *Discourse*, but also in his properly scientific works like *The World*. As

Lawrence Noal says, ‘What makes the work [*The World*] so ambitious is its effort to explain all physical phenomena in purely mechanical terms – that is, as a function of the size, shape, and motion of corpuscles or insensible parts of matter. This marks an implicit rejection of traditional, Scholastic-Aristotelian modes of explanation in terms of qualities, immaterial forms, powers, faculties, which the new scientists regarded as vacuous and occult’ (xlv). As is well known, Descartes, as Galileo (see the intellectual biography *Galilei, Galileo* by Peter Machamer, 314, 316), embraced the Copernican theory, even though he preferred not to publish those parts of *The World* where his adherence to Copernican theory was evident; he knew what Galileo suffered because of the Inquisition. Nonetheless, the core of his thought was already mature since the publication of his *Discourse* and the posthumous *Rules for the Direction of the Mind*, where the concept of *mathesis universalis* (see the entry *Mathesis Universalis* by Frédéric De Buzon, 475-478), conceived as a general science that can explain everything that can be investigated concerning order and measure, finds its articulation in the famous four rules: evidence, analysis (see the entry *Analysis versus Synthesis*, by David Cuning, 7-12), synthesis and enumeration (see the entry *Enumeration* written by Kurt Smith, 237-239). Analogous to Leibniz’ *ars combinatoria*, the concept of *mathesis universalis* is the culmination of an anti-Aristotelian view of philosophy, so in this sense one can say that Descartes is modern by virtue of his anti-Aristotelianism.

As it is well known, for Scholastic-Aristotelian philosophy (see the entry *Scholasticism* by Marleen Rozemond, 664-667) it was impossible to apply mathematics to the imperfection of physical objects, but Descartes, by following Galileo, ‘rejected this view and revolutionized the conception of physical objects (or “bodies”) by reducing them to spatial extension alone (length, breadth, and depth). This new conception entails that the only properties of bodies are mechanical – namely, size, shape, and motion – which means that only these properties can figure into scientific explanation’ (li). That way, it was possible to unify celestial and terrestrial physics (on this topic see the following entries: *Physico-Mathematics* by John A. Schuster, 585-587, and *Physics* by Peter Machamer and Mary Domski, 587-592), which remained separated in Scholastic-Aristotelian thought. In fact, as Nolan says in his biographical note on Descartes, *The World* ‘envisages a unified science of nature in which all phenomena are explained by means of a few simple laws and an austere conception of matter as bare extension – homogeneous and inert.’ Descartes realized that his explanatory theories would violate our common sense understanding of the world and so infuses the work with several clever and intuitive analogies (xlv).

Descartes realized that the right methodology (see the entry *Method* by Yitzhak Melamed, 508-513) for the investigation of natural phenomena was not based on pure observation or on the qualitative aspects of matter (see the entries *Quality, Real* by Marleen Rozemond, 620-621 and *Quality, Sensible* by Jill Buroker, 621-625), because to have *scientia* (knowledge), as Tom Sorell says in *Knowledge (Scientia)* ‘concerning celestial or terrestrial objects was to have knowledge of the motion, shapes, positions, and numbers of their parts’ (423). The French thinker realized that the only aspects of phenomenal reality that can be taken into account by scientists are the mathematical and geometrical ones (see the entries *Geometrical Exposition* by Noa Shein, 319-321 and *Geometry* by Douglas Jesseph, 321-329).

Despite the importance of certainty and evidence for mathematics, Descartes realized that it was extremely important to give certainty a philosophical foundation, and in order to do so we have to find something we cannot doubt, that is to say the *Cogito*. Descartes’ philosophy is well known just for the assertion *cogito ergo sum*, but this *Lexicon* takes into account not only Descartes’ most famous concepts, but rather all of them, including morals, natural science, theology, theodicy, optics, geometry, anatomy, physiology, dioptrics, metaphysics, mathematics, hydrostatics, physics, magnetism, music, logic, language, and so on.

This volume is the result of the greatest research project on Descartes ever undertaken, and it is not an exaggeration to say that this *Lexicon* has already become an indispensable tool for the study of Descartes' thought.

To conclude, it is worthwhile to note that this volume contains many resources such as bibliographies, a biography and annotated bibliography concerning Descartes' life and works, cross-references for all the entries in the volume, translations of the passages taken from Descartes' works and finally a detailed index.

Giacomo Borbone, Catania University