49 RENÉ DESCARTES

1596-1650

René Descartes, the famous French philosopher, scientist, and mathematician, was born in 1596, in the village of La Haye. In his youth he attended a fine Jesuit school, the College of La Flèche. When he was twenty, he obtained a law degree from the University of Poitiers; however, he never practiced law. Though he had received an excellent education, Descartes was convinced that there was very little reliable knowledge in any field, with the exception of mathematics. Rather than continuing his formal education, he decided to travel throughout Europe and see the world for himself. As his family was well-to-do, Descartes's income was sufficient to enable him to travel freely.

From 1616 to 1628, Descartes traveled extensively. He served briefly in three different armies (those of Holland, Bavaria,

and Hungary), though apparently he was not involved in any combat. He also visited Italy, Poland, Denmark, and other countries. During these years, he formulated what he considered to be a general method for discovering truth. When he was thirty-two years old, Descartes decided to apply his method in an attempt to construct a comprehensive picture of the world. He then settled in Holland, where he was to live for the next twenty-one years. (He chose Holland because there was more intellectual liberty there, and also because he preferred to be away from the social distractions of Paris.)

About 1629, he wrote *Rules for the Direction of the Mind*, a book in which his method was outlined. (However, the book is incomplete and was probably never intended for publication; it was first published more than fifty years after Descartes's death.) In the years from 1630 through 1634, Descartes applied his method to the study of the sciences. To learn more about anatomy and physiology, he performed dissections. He engaged in major independent research in optics, meteorology, mathematics, and several other branches of science.

It was Descartes's intention to present his scientific results in a book to be called *Le Monde* (the world). However, in 1633, when the book was almost finished, he learned that church authorities in Italy had convicted Galileo for advocating Copernicus's theory that the earth revolved about the sun. Though in Holland he was not subject to the Catholic authorities, Descartes nevertheless decided that it would be prudent of him not to issue his book, as in it, he, too, defended the Copernican theory. Instead, in 1637, he published his most famous work, his *Discourse on the Method for Properly Guiding the Reason and Finding Truth in the Sciences* (usually abbreviated to *Discourse on Method*).

The *Discourse* was written in French rather than Latin, so that all intelligent persons could read it, including those who had not had a classical education. Appended to the *Discourse* were three essays in which Descartes gave examples of the discoveries he had made by the use of his method. In the first such appendix,

the *Optics*, Descartes presented the law of refraction of light (which had, however, been discovered earlier by Willebrord Snell). He also discussed lenses and various optical instruments; described the functioning of the eye and various malfunctions; and presented a theory of light that is a preliminary version of the wave theory later formulated by Christiaan Huygens. His second appendix comprised the first modern discussion of meteorology. He discussed clouds, rain, and wind, and gave a correct explanation for the rainbow. He argued against the notion that heat consists of an invisible fluid, and he correctly concluded that heat is a form of internal motion. (But this idea had already been presented by Francis Bacon and others.) In the third appendix, the *Geometry*, Descartes presented his most important contribution of all, his invention of analytic geometry. This was a major mathematical advance that prepared the way for Newton's invention of calculus.

Perhaps the most interesting part of Descartes's philosophy is the way he begins. Mindful of the large number of incorrect notions that were generally accepted, Descartes decided that in order to reach the truth he must make a fresh start. He therefore begins by doubting everything—everything his teachers had told him, all of his most cherished beliefs, all his commonsense ideas—even the existence of the external world, even his own existence—in a word, *everything*.

This, of course, leads to a problem: how is it possible to overcome such universal doubt and obtain reliable knowledge of *anything*? Descartes, however, by a series of ingenious metaphysical arguments, was able to prove to his own satisfaction that he himself existed ("I think, therefore I am"), that God exists, and that the external world exists. These were the starting points of Descartes's theory.

The importance of Descartes's method is twofold. First, he placed at the center of his philosophical system the fundamental epistemological question, "What is the origin of human knowledge?" Earlier philosophers had tried to describe the nature of the world. Descartes has taught us that such a question cannot be

answered satisfactorily except in conjunction with the question "How do I know?"

Second, Descartes suggested that we should start not with *faith* but with *doubt*. (This was the exact reverse of the attitude of St. Augustine, and most medieval theologians, that faith must come first.) It is true that Descartes then proceeded to reach orthodox theological conclusions. However, his readers paid far more attention to the method he advocated than to the conclusions he reached. (The Church's fears that Descartes's writings would in the end prove subversive were quite justified.)

In his philosophy, Descartes stresses the distinction between the mind and material objects, and in this respect advocates a thoroughgoing dualism. This distinction had been made before, but Descartes's writings stimulated philosophical discussion of the subject. The questions he raised have interested philosophers ever since, and have still not been resolved.

Also highly influential was Descartes's conception of the physical universe. He believed that the entire world—aside from God and the human soul—operated mechanically, and that therefore all natural events could be explained by mechanical causes. For this reason, he rejected the claims of astrology, magic, and other forms of superstition. He likewise rejected all teleological explanations of events. (That is, he looked for direct mechanical causes and rejected the notion that events occurred in order to serve some remote final purpose.) From Descartes's outlook, it followed that animals were, in essence, complicated machines, and that the human body, too, was subject to the ordinary laws of mechanics. This has since become one of the fundamental ideas of modern physiology.

Descartes favored scientific research and believed that its practical applications could be beneficial to society. He felt that scientists should avoid vague notions and should attempt to describe the world by mathematical equations. All this sounds very modern. However, Descartes, though he made observations himself, never really stressed the crucial importance of experimentation in the scientific method.

The famous British philosopher Francis Bacon had proclaimed the need for scientific investigation, and the benefits to be expected therefrom, several years before Descartes. Nor was Descartes's celebrated argument, "I think, therefore I am," original; it had been stated more than 1200 years earlier (in different words, of course) by St. Augustine. Similarly, Descartes's "proof" of the existence of God is merely a variation of the ontological argument first presented by St. Anselm (1033-1109).

In 1641, Descartes published another famous book, the *Meditations*. His *Principles of Philosophy* appeared in 1644. Both were originally written in Latin, but French translations appeared in 1647.

Although Descartes was a polished writer, with a charming prose style, the *tone* of his writings is surprisingly old-fashioned. Indeed, he often sounds (perhaps because of his rationalist approach) like a medieval scholastic. By contrast, Francis Bacon, though born thirty-five years before Descartes, has a quite modern tone.)

As his writings make clear, Descartes was a firm believer in God. He considered himself a good Catholic; however, Church authorities disliked his views, and his works were placed on the Catholic *Index* of forbidden books. Even in Protestant Holland (at that time, probably the most tolerant country in Europe), Descartes was accused of atheism and had trouble with the authorities.

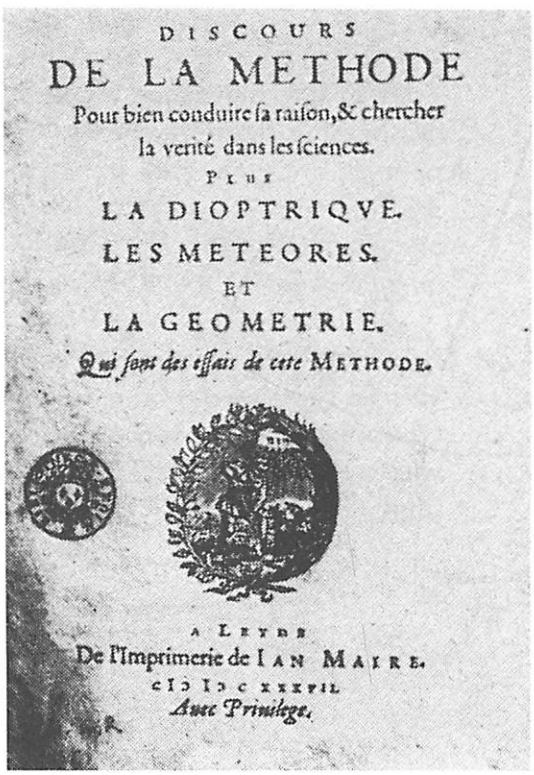
In 1649, Descartes accepted a generous financial offer from Queen Christina of Sweden to come to Stockholm and become her private tutor. Descartes liked warm rooms, and had always enjoyed sleeping late. He was much distressed to learn that the queen wanted her lessons given at five o'clock in the morning! Descartes feared that the cold morning air would be the death of him, and indeed it was: it was not long before he caught pneumonia. He died in February 1650, only four months after arriving in Sweden.

Descartes never married. However he had one child, a daughter, who unfortunately died young.

Descartes's philosophy was strongly criticized by many of his contemporaries, in part because they felt that it involved circular reasoning. Subsequent philosophers have pointed out many shortcomings in his system, and few people today would defend it wholeheartedly. But the importance of a philosopher does not depend solely on the correctness of his system: of greater significance is whether his ideas—or rather, the ideas that others extract from his writings—prove widely influential. On that basis, there is little doubt that Descartes was an important figure.

At least five of Descartes's ideas had an important impact on European thought: (a) his mechanical view of the universe; (b) his positive attitude towards scientific investigation; (c) the stress he laid on the use of mathematics in science; (d) his advocacy of initial skepticism; and (e) the attention he focused on epistemology.

In assessing Descartes's overall importance I have also taken into account his impressive scientific achievements, in particular his invention of analytic geometry. It is that factor which has persuaded me to rank Descartes substantially higher than such eminent philosophers as Voltaire, Rousseau, and Francis Bacon.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