

## GREEK SCIENCE

Frederic Will, Ph.D.

**A view of the issue** Ancient Greek science assumes many forms: theories about the nature of the universe; observations and classifications of what is in nature; and practical programs like medicine, based on the understanding of the natural world.

**Milesian theories about the universe** Of the earlier Greek scientists we would think first of Thales (d. 545 B.C.E.), from Miletus on the coast of Asia Minor. (That coast, with its eastern exposure to influences from Mesopotamia, Egypt, and Phoenicia, was productive for many early Greek thinkers, the scientist-philosophers Anaximander and Anaximenes, as well as Thales.) Thales was an observer of nature, who asked questions about what he saw—*what is the fundamental principle of all I see around me, he asked, how tall are the pyramids, how far are ships from the shore when we observe them out beyond us, what is the inner principle of magnetism that draws metal particles to a lodestone*—and who came up with answers both ‘fanciful’ and ‘spot on.’ His reasoning was often of the simplest and most satisfying kind: say, comparing to one another the shadows cast by a man and a pyramid, and therefrom calculating the height of the pyramid. He remains best known to us for his notion that water is the fundamental principle of physical reality, into which all other forms can resolve.

**Other early theories** Thales, from Asia Minor, was only one of a number of thinkers from that region, who speculated on the fundamental character of natural reality—thus creating a blend of science and metaphysics. Anaximenes (d. 525 B.C.E.) formulated the theory that the *infinite air* was the first principle, while Heraclitus (d. 475 B.C.E.) spoke of change and flux as the ultimate principles of reality.

**Aristotle and the classification of nature** Aristotle (384-322 B.C.E.) can represent the drive behind Greek scientific inquiry after the classical period. A pupil of Plato, and consequently well trained in logic, epistemology, and ethics, he was at the same time unrivalled in his attention to understanding the natural world, which he considered an unceasing marvel. Not only did he observe tirelessly but he classified: plants, body parts and functions, medical procedures, mechanical operations, astronomical phenomena. His contributions to later thought have often been undervalued, for he lacked tools or techniques needed for experimental study, but the largeness of his scope, in laying nature out for mankind to study, was a stimulus which even the great scientists of the 17th century took full advantage of, while to a mediaeval visionary, like Dante, Aristotle remained the ‘maestro di color che sanno,’ the ‘master of those who know.’

**Ancient Greek medicine** For Homer, who in his work makes mention of 150 different body parts—evidence enough of the early Greek interest in our bodies—disease was revenge from the gods, for our evil behavior, and only prayer and sacrifice could restore the harmony between humans and their creators. This view was soon exposed to an experimental light; empirical attention was devoted to the arts of healing. By 700 B.C.E. the first Greek medical school had been founded. The physician Hippocrates (470-360 B.C.E.), practicing on the island of Cos, matured the theory of the humors, arguing that when the balance among the four principal constituents of the body—blood, bile, black bile, and phlegm—became disturbed, disease resulted. The job of the physician was to prescribe medicines that restore the body’s balance. Among many later Greek physicians, Galen (d. 207 B.C.E.) stands out for his breadth—‘the best physician is also a philosopher,’ he believed—and the concrete observations he mastered from his adventures in surgery and vivisection. Galen’s word ruled in western medicine, for the next 1300 years.

### Readings

Clagett, Marshall, *Greek Science in Antiquity*, New York, 1955.

Nutton, Vivian, *The Healing Hand: Man and Wound in the Ancient World*, New York, 2004.

**Discussion questions**

Did Greek scientists adopt the scientific method, in the sense given that expression during the 17th century in Europe? Explain.

Five hundred years separated Hippocrates from Galen. What kind of developments occurred between the two physicians, that enabled Galen's empirical interventions to replace Hippocrates' theory of humors?

How did the Milesian scientist/philosophers contribute to our concrete understanding of natural phenomena?