A brief analysis is given of the primary origins of Western science with the ancient Greeks, followed by the development of modern European scientific thinking in these stages: through the logical control of argument mastered by the philosophical community of the medieval universities; the designed and measured control of materials and practices achieved by the rational artists of the Renaissance; and the reasoned control of scientific investigation established by the experimental philosophers of the seventeenth century. The rational constructive artist and the rational experimental scientist appear as products of the same intellectual culture, as exemplary men of virtù. A consideration of the intellectual and moral style integrating these movements in the arts and sciences offers a means of defining the identity of science within Western culture and of relating this to other historical cultures.

Plato's Pythagorean friend the mathematician Archytas of Tarentum commented on their immediate predecessors and contemporaries in the 4th century B.C. as follows:

Mathematicians seem to me to have an excellent discernment and it is in no way strange that they should think correctly concerning the nature of particulars. For since they have passed excellent judgement on the nature of the whole, they were likely to have an excellent view of separate things. They have handed on to us a clear judgement on the speed of the stars and their rising and setting, as well as on geometry
and numbers, and not least on music; for these mathematical studies appear to be related.

This comment illustrates both the continuity and the mutations of the Western scientific tradition. It was found with other fragments of Archytas by the 15th-century Italian scholar Giorgio Valla among the Greek manuscripts brought to Italy from Constantinople, published in a Latin translation in Valla’s encyclopaedic and influential De expetendis et fugiendis rebus opus (1501), and cited in the 16th century to exemplify the foundation of the sciences both of material things and of human perception on mathematical reasoning and quantity. This seems to link us now with Archytas in a continuous living tradition extending from the ancient Greeks to the present. But his words invite us also to ask what he himself meant by “the nature of the whole” in this arcane and somewhat paradoxical context. They invite us to put ourselves at the viewpoint of Archytas’s particular vision of existence and of the possibilities of knowledge, at the viewpoint of his interpreters in the 16th century, and in general to treat the history of science (including medicine and technology) as a kind of comparative intellectual anthropology.

Every society has a cultural ecology in which its view of nature and of man is conditioned both by its physical and biological environment and by its mental vision of existence and knowledge and their meaning. I certainly share the belief that one main reason for studying history is to understand ourselves. Today’s problems can indeed alert us to formerly unnoticed counterparts in the past. The dramatic irrationalism of our time for example has sensitized us to the irrational in earlier societies and individuals, and likewise our contemporary experience of the relativity of beliefs and values has given emphasis to differences in expectation and action among different societies and cultures, as opposed to an enduring rational similarity of all men. Yet if each generation is pre-

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1 H. Diels - W. Kranz, Die Fragmente der Vorsokratiker, 47 B 1, 6te Aufl. (Berlin, 1951). This fragment was quoted by Porphyry and first printed in Greek in his In Harmonica Ptolemaei commentarius, c. 3, ed. in J. Wallis, Opera mathematicorum, III (Oxoniae, 1699) 236-8; cf. Plato, Republic, VII, 530D. This paper is based on the historiographical introduction to my forthcoming book Styles of Scientific Thinking in the European Tradition, which contains full documentation with bibliographies.

2 Published in Venice after Valla’s death in 1499 by his son: see dedicatory preface, and lib. VI, c. 4 for his Latin version of the fragment of Archytas quoted by Porphyry; cf. for Valla and his manuscript collection G. Ceredi, Tre Discorsi sopra il modo d’alzar acqua da’ luoghi bassi (Parma, 1567) 11-12; J. L. Heiberg, Beiträge zur Geschichte Georg Valla’s und seiner Bibliothek (Beiträge zum Centralblatt für Bibliothekswesen, XVI; Leipzig, 1896); R. R. Bolgar, The Classical Heritage and its Beneficiaries (Cambridge, 1954); G. Cardenal, P. Landucci Ruffo, C. Vasoli, raccolti e presentati da V. Branca, Giorgio Valla tra scienza e sapienza (Firenze, 1981); and the related forthcoming studies of Francesco Maurolico by R. Moscheo.