

Kim H. Veltman

Review:

Martin Kemp, *Leonardo da Vinci. The Marvellous Works of Nature and Man*, Cambridge, Mass: Harvard University Press, 1981.

Professor Kemp has set out to write about Leonardo as a whole and has succeeded admirably. His chronological account is much more than a simple list of facts. He offers explanations how the major paintings fit into Leonardo's development, with stimulating interpretations in each case. While the book has an artistic bias Leonardo's science in its universality receives attention: e. g. his studies in perspective, engineering, aeronautics, water, pulleys, stage-designs, cartography, geometrical transformation, anatomy, geology, optics and astronomy. Kemp outlines Leonardo's development from a concern with how questions in the first Florentine period (pre-1482) to a preoccupation with why questions (86, 89) in the first Milanese period (1482-1500). In the early period, he claims, Leonardo worked from function to form. In the late period this was reversed (286, 289). That Leonardo sometimes regresses in the late period is not mentioned.

Too often Leonardo is seen as either an illiterate or a copyist. Kemp strikes a balance, reminding us of Leonardo's debts to tradition while stressing his independent contributions. Nonetheless, the role of tradition could have been stressed more. The diagram concerning squaring of the circle (253) is almost certainly from Francesco di Giorgio Martini's treatise in which he wrote marginalia. Leonardo's concern with illusions reflects tradition, not a new awareness (332): e. g. the passage on G 26v (333) paraphrases Euclid's *Optics* (th. 10). Traditional also is the view of astronomy as an adjunct of optics (324): cf. Ptolemy, Witelo, Peckham. In Leonardo's writings the links between optics and astronomy are more extensive than Kemp suggests. With respect to anatomy Kemp finds a "major innovation" in the 'shared habitation of fantasia and intelletto' in the central cavity (127). Similar diagrams in Prothenus' *Triloquium* (1498) and Achillini's text (1503) suggest that this idea was not privy to Leonardo.

Kemp's view of Albertian perspective (331) and its relation to Mediaeval optics is problematic. He accepts the standard interpretation (Panofsky, 1927) that Alberti introduced an homogenous, unified, infinite space. The first mss. of Alberti's *On Painting* have no illustrations, however. Even Piero della Francesca's treatise deals solely with isolated objects: there are no vast spatial views. Leonardo's special role in the history of perspective, his experimental approach that leads him to the inverse size/distance law that Euclid and Piero had denied, is not mentioned.

Under 'experiment' in the index (371) one is referred to 'empiricism'. Kemp mentions experiment, but also sceptically (86). We therefore lose sight of the Leonardo who carefully wrote "experimented" or "not experimented" above various folios of the Codex Forster II2 and elsewhere.

Kemp finds Leonardo's studies of *lunulae* and geometrical transformations excessive (296), notes that Leonardo classed these as *De ludo geometrico* and claims that these (298):

'geometrical games' would have stood in much the same relationship to the sublime science of Euclid as a crossword puzzle stands in relation to the composition of poetry.

This is misleading: cf. *Forst. I 40^v* which he himself quotes (252). The *Ludi geometrici* of Alberti were much more than games. Nicholas of Cusa's *De ludo globi* confirms how metaphysical 'play' could be at the time.

Leonardo's concern with musical analogies is probably overemphasized (110-113, 127, 133, 170, 198, 205, 275). Even if he did produce the woodcuts of Gafori's musical treatise, Leonardo appears to have abandoned such comparisons in the late period. The book's 88 plates provide a good sample of paintings and notes. There are also 100 figures based on sketches in the notebooks: Unfortunately, these copies (eg. fig. 62) give no idea of the precision and love that Leonardo devoted even to everyday diagrams.

Kemp stresses Leonardo's tendency to rework his ideas after 1507 (223). True. But this principle runs through his whole career. A question in one notebook is often answered years later in another. A rough diagram usually recurs elsewhere in developed form.

Leonardo's comments concerning visual as opposed to verbal statements (289) are noted, but deserve more attention. The c. 6,500 pages of extant notes contain c. 100,000 figures. Why was Leonardo so visual?

Leonardo's systematic treatment of the heart and water are referred to as if they were exceptions (312): as if he were usually chaotic. This is misleading. The *Ms. A* (1492) contains 13 consecutive folios on perspective and optics. There are, for example, systematic treatises on transformational geometry (*Forst. I*), vision (*Ms D, F*), water (*Leicester now Hammer*), optics (*Ms C*) not to mention the anatomical *Corpus (Windsor)*.

The scientific side of Leonardo has come somewhat short. Here the Kemp's otherwise representative list of literature omits various standard works: e. g. Venturi, Uzielli, Solmi, Werner, Uccelli or McCabe. Leonardo's position in the artist-engineers tradition (89-90) has been noted before (Olschki, Gilles). With regard to the pyramidal law (144) Keele should have been cited. Incidentally, the new edition of the *Windsor Corpus* is primarily by Keele and not as is recorded (364). Kemp emphasizes the Map of Imola (228-229). According to Mancini's recent study (2 vol.), the original map is not by Leonardo.

One could go on to quibble about problems of translation. The passage on *E 16v* (331) is cited out of context: what Kemp translates as "perspective made by art" is actually a reference to anamorphosis. By omitting the last part of the sentence on *A 90r (Ash. II, 10r)*, a misleading translation results.

But quibbles aside, Kemp has produced a very readable book that is largely accurate, full of insights, providing much more than a typical survey of a very complex individual. Through Leonardo he has, moreover, thrown light on that which his title promises: the marvellous works of nature and man.

KHV

AvH Research Fellow

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