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Review: *Leonardo da Vinci - Anatomical Drawings from the Royal Library Windsor Castle*, Kenneth D. Keele ed., (New York, the Metropolitan Museum of Art, 1984), *Annals of Science*, London, Vol. 42, No.4, (July 1985), pp. 189-190.

LEONARDO DA VINCI, *Anatomical Drawings from the Royal Library Windsor Castle*. New York: The Metropolitan Museum of Art, 1984. 184 pp. £30.50.

This catalogue of an exhibition at the Metropolitan Museum of Art in New York from 20 January through 15 April 1984, opens with a foreword by the museum's director, a preface by the royal librarian at Windsor, an introduction by Carlo Pedretti and an essay on Leonardo as anatomist by Dr K. D. Keele. Eight colour plates of skulls, wombs, shoulders, arms, legs and a complete body give some sense of the remarkable sensitivity, precision, beauty and detail of Leonardo's anatomical drawings.

The main body of the catalogue is divided into nine sections: the internal organs (figures 1 and 2), early anatomical studies (3-7), head and brain (8-11), the alimentary and reproductive systems (12-19), the muscles and skeleton (20-33), the heart (34-38), comparative anatomy (39-42), human proportions (43-46) and the nude (47-50). This selection shows the chief topics of Leonardo's anatomical studies, provides a good indication of his diversity of treatment and was originally intended (1977) to convey his development chronologically (p.8). Ironically, Pedretti's more recent studies in chronology, as recorded in Keele's new edition of the *Windsor Corpus*, have undermined this sequence (p. 166). The illustrations in the catalogue are numbered 1 to 50. However, many of these include both the recto and verso of a folio such that 80 sheets are in fact shown. Of these there are seven for which ultraviolet photographs are also provided.

The catalogue ends with a brief chronological table of events in Leonardo's life, a glossary of key technical terms, table of concordance and a bibliographical note concerning other work on the subject, Keele's in particular.

In substance the text is not new. It appeared in the German catalogue for the Hamburg exhibition, the Italian catalogue for the Florence exhibition (both 1979) and in the catalogue *Leonardo da Vinci, Anatomical Drawings from the Royal Collection* for the 1977 exhibition at the Royal Academy of Arts, London. There are slight differences such as an altered preface and foreword. The London catalogue includes a photograph of Pompeo Leoni's original binding and two sheets (28, R.L. 12281v and 3B, R.L. 12627r) which are omitted in the New York catalogue. There is one sheet (9B, R.L. 12603r) in this new catalogue, not in the London version. The layout is also different. The London catalogue has alternating sections of text followed by a series of illustrations. The New York catalogue, in folio format, often has text and illustration opposite one another which makes for greater intelligibility. It also includes a concordance to the new *Windsor Corpus* (p. 116) not yet available at the time of the London catalogue and offers translations of the original English into American, whence 'centre' becomes 'center' and

'marvellous' becomes 'marvelous' (p. 11). These superficial changes aside, the New York version adapts verbatim the text of the London catalogue (1977), which in turn is based on that prepared for the 500th anniversary exhibition at the Royal Academy in 1952.

Keele gives technical medical descriptions which are admirable for their clarity and succinctness, interspersing these with Leonardo's own words in translation, identifying difficult terms and in one case a passage which eludes translation (p. 33). He carefully places Leonardo within the medical tradition, noting when ideas are based on Hippocrates (p. 39), Galen (e.g., p. 58), Avicenna (e.g., p. 69) or Mondinus (p.110), as well as parallels with later medical researchers such as Highmore (p. 48) or Cheseldon (p. 113). A finicky scholar who complains that these learned references are not always footnoted is referred to Keele's authoritative edition of the *Windsor Corpus*.

All of the sheets in this catalogue have appeared in earlier publications, including the late Lord Clark's *Drawings of Leonardo da Vinci* (1935, second edition, 1968-1969). His contribution lay in mapping out their chronology from the viewpoint of an excellent connoisseur. An implicit hostility towards science led him to focus on aesthetic dimensions of Leonardo. Keele, by contrast, became interested in the subject as a medical student when he literally stumbled over a new edition of Leonardo lying on the floor at the library of the Royal College of Surgeons in London. Over the past 50 years, in addition to being a consultant cardiologist, founding a hospital, doing research on pain, and being a moving force in developing societies for the History of Medicine in England, he has been the only person to probe deeply into Leonardo's science.

Keele has shown how a concept of four powers (movement, weight, force and percussion) which guides the whole of Leonardo's science underlies his anatomical studies also (cf. pp. 11-12), a claim which he has developed at length in his latest book *Leonardo da Vinci's Elements of the Science of Man* (New York, 1984). With respect to anatomy in particular he has rejected unfounded claims for Leonardo's originality, such as the discovery of circulation of the blood (p.123: cf. his book in 1952). He has assessed critically the role of three main types of anatomical drawing: 'those derived from his mediaeval predecessors, drawings of descriptive anatomy, from untrammelled observation and drawings illustrating his own physical laws applied to the human body' (p. 13).

A lifetime of study has thus produced an authoritative edition of the *Windsor Corpus of Anatomical Studies* and also transformed our appreciation of their significance for both the history of medicine and science. The New York catalogue is a distillation of that contribution and will remain as a refreshing example of how the critical love of an *amateur*, in the old sense, can make basic contributions of which professors (especially in the new sense) need take note.

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