

Science + The Arts in The Renaissance

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The Renaissance Development of the Scientific
Illustration*

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There is hardly a more familiar artifact of modern life than the so-called scientific illustration. That is, the diagram or picture in isometric or linear perspective with notations for scale and measurement which show how machines or houses or even human beings are put together and taken apart and how they work. Who, indeed, has never depended on such an illustration for assembling a Christmas bicycle or a Sears & Roebuck porch swing (not to mention for constructing an atomic reactor or preparing for open heart surgery)? So taken for granted is the ubiquitous scientific illustration that few scholars have ever sensed that it has any historical interest. Most art historians have disdained it. They have investigated scientific pictures only when drawn by great creative geniuses like Leonardo da Vinci. Otherwise, they consider the genre remarkably inimical to creativity, a mere prostitute to someone else's verbal text.

Historians of science have shown a little more curiosity, but they too tend to treat scientific pictures only as afterimages of verbal ideas. Few historians of any kind have studied the scientific illustration as a unique form of pictorial language, with its own "grammar and syntax"; that is, symbols and conventions conveying information just as do words and sentences.¹ Nor have many scholars ever applied to the scientific illustration the tools of iconology, that wonderful subdiscipline of art history which explains how pictorial symbols work, how they are derived and change in form and meaning, and most important of all, how they reveal profound truths about the society which produced them.²

I would like to offer here some ideas of my own about the origin and

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development of the scientific illustration, indeed, its special iconology in the context of Western Christian civilization at the time of the Renaissance from the fourteenth through the sixteenth centuries. What is especially interesting about this development was its steady progress toward the sheer objectification of forms without due sacrifice of esthetic quality. No other tradition of pictorial representation, in classical antiquity, in China or Islam during their artistic heyday, ever achieved such objective power. In fact, at its best, the Renaissance scientific picture gave precise information about the physical world not only without need of explanatory texts but without the need for the viewer to refer to the actual objects depicted. It may have been of no small significance to their later contributions that the first generations of "modern" scientists like Francis Bacon, Galileo, William Harvey, and Descartes, were also the first to have before them as schoolboys scientific textbooks illustrated in the new Renaissance chiaroscuro and linear perspective style. *
Key

Art historians of all periods and cultural specializations recognize one other quality of Western art unshared with the arts of anywhere else. This was the propensity, first noticeable in the painting of classical antiquity, to think of the picture as a fictive window or hole in the wall or book page. During the early Middle Ages, this concept was somewhat forgotten as Christian art was more influenced by oriental flatness. But suddenly, in the late thirteenth century, the picture-as-window was revived, especially in the fresco cycles celebrating the life and miracles of St. Francis of Assisi in central Italy. The startlingly sculpture-like figures in these paintings, many attributed to Giotto and enframed as if inset on a three-dimensional stage, mark the beginning of the Renaissance for art historians. Almost at the same time, the revival of the picture-as-window began to occur in the manuscript illuminations of artists working in the royal court of France.

What is important to our subject here is that this revived "window" notion had inexorable consequences for Western art. It began to force the artist to think of the various details in his pictures as seen from a more or less fixed view point, as if he were looking at them from the center of an opening through a frescoed wall or illuminated page. This tendency culminated, of course, in linear perspective and in the perfection of drawing light and shadow effects; i.e., the representation of chiaroscuro in two-dimensional artistic media. A superb example of this purely Western achievement is a painting by Antonello da Messina, circa 1450-55, entitled *St. Jerome in his Study*. It is interesting to compare this masterpiece of the flowering Italian Renaissance to a Chinese painting of about the same period, that is, from the Ming Dynasty, circa 1530, by Zhou Chen called *Dreaming of Immortality in a Thatched Cottage*. What these two pictures together show is not just a difference in artistic style but a monumental difference in perception of nature itself. In the Chinese painting we see a philosopher leaning on the sill of his hut at the lower right. In his dreamy contemplation, the philosopher projects himself into the infinite landscape where we see him again, mystically levitated, as he ponders the transience of nature. Whether the artist intended this lovely mountainscape to be an



Antonello da Messina, *St. Jerome in His Study*. Trustees of the National Gallery, London.

illusion of extending space or not, he still added the inscription, at upper left, right on the picture surface without any apparent conflict in his mind that the flatness of the verbal inscription contradicted the illusion of pictorial depth. Indeed, Chinese artists never considered that they should portray nature as if



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