Anthony Panzera, a painter, draftsman, and teacher at Hunter College, in New York City, wrote a book about Leonardo’s notebooks for which he drew original illustrations (inspired by the Renaissance master’s proportional theories) to accompany his thoughts and research. He agreed to let Drawing magazine excerpt part of his unpublished book. Below is a portion of what Panzera wrote about Leonardo’s famous drawing The Vitruvian Man.

by Anthony Panzera

Learning From Leonardo’s The Vitruvian Man

Leonardo was in the habit of constantly making lists. The notes above are part of a larger list of things to buy, books to borrow, people to see, and events to remember. The items are neatly arranged in three columns on the inside cover of a small pocket book measuring 6 x 4½ inches, and designated as MS. F, at the Institut de France, in Paris.

The writing is very small, some of it in sanguine pencil, written over in pen and brown ink to make it permanent. Vitruvius’ name appears along with various other items in the far left corner, and under it Leonardo writes, “Messer Ottaviano Pallavicino pel suo Vetruvius.” ([See] Mr. Ottaviano Pallavicino for his Vitruvius Messer Ottaviano Palavicino for his Vitruvius go every Saturday to the hot bath where you will see naked men.

My interpretation of The Vitruvian Man is part of a larger investigation to prove the theories of proportion laid down in Leonardo’s notebooks. Other examples of my exploration of these theories follow on subsequent pages.
The Proportions of the Human Body
According to Vetrivus (The Vetrivian Man)
by Leonardo da Vinci, ca. 1490, pen and brown ink, brush, and some wash over metalpoint, 13⅛ x 9⅛.
Collection Gallerie dell’Accademia, Venice, Italy.
because the first printed editions did not appear until 1511, and presumably, it was a manuscript copied in the vernacular (the “vulgar” Italian dialect) because Leonardo could neither read nor write in Latin or Greek. In addition, he was already well acquainted with the book, or at least that portion of the book’s teachings that inspired his drawing of the famous figure inscribed in a circle and a square, *The Proportions of the Human Body According to Vitruvius*, also known as *The Vitruvian Man*. That iconic drawing, probably the most famous drawing in the world, was created by Leonardo in 1490, some 18 years earlier. It established, in both word and image, the core of his theories on human proportion, as well as a visual analysis of the Vitruvian text. What is important is how Leonardo first learned of Vitruvius’ book before he asked to see Pallavicino’s copy.

**VITRUVIUS’ TEN BOOKS ON ARCHITECTURE**

Marcus Vitruvius Pollio, the famous architect and engineer, lived and worked in Rome ca. 90 to 20 B.C. Toward the end of his life in the mid-20s B.C., he presented to Augustus Caesar 10 written scrolls containing everything he had learned from the ancient Greeks about architecture. The scrolls were intended as a guide to aid in the proper education and practice of young architects at a time when, Vitruvius felt, the lessons and knowledge learned from the ancients were being lost. He had hoped to revive the grandeur and stability of Hellenistic architecture by re-establishing the rules and ideals of the past. Vitruvius’ book continues to be “the most complete and authentic source for cataloguing the elements, proportioning systems, and ideals underlying the classical architectural system,” according to historian Thomas Gordon Smith.

In defining the essence of sound architecture as “integrity, strength, function, and beauty,” Vitruvius stressed an understanding of building materials, the essential features and character of the three great architectural orders (Doric, Ionic, and Corinthian), and the elements of proportion. In his treatise, Vitruvius described the six most important principles necessary in resolving issues of architectural design. They are listed in Latin as: *Ordinatio*, *Symmetria*, *Dispositio*, *Eurythmia*, *Decor*, and *Distributio*.

For the purpose of our discussion, only the first two, *Ordinatio* and *Symmetria*, concern us. Both, according to Smith, “are methods of determining numerical ratios to define the proportions of large and small scale elements in a building.” *Ordinatio* is “the basis for proportional relationships based on the module that serves as the common denominator for a complex whole.” *Symmetria* “is the relationship between the modular unit and the figure by which it is multiplied or divided to arrive at the dimensions of the whole.” Implied here is not the conventional meaning of symmetry, but a secondary meaning—“the excellence or beauty of form or proportion as a result of such correspondence,” meaning the sensitive and subtle correspondence of the part to the completion and fulfillment of the whole.

That brief introductory description (translated by Morris Hicky Morgan) of a small portion of Vitruvius’ book is germane to our topic because it forms the basis of understanding what Vitruvius, in Book III, Chapter I, goes on to explain:

The design of a temple depends on symmetria, the principle of which must be most carefully observed by the architect. They are due to proportion—in Greek, analogia. Proportion is a correspondence among the measures of the members of an entire work, and of the whole to a certain part selected as standard. From this results the
principles of symmetria. Without symmetria and proportion there can be no principles in the design of any temple; that is, if there is no precise relation between its members, as in the case of those of a well-shaped man.

Although the main topic of Book III is the building of Ionic temples, Vitruvius begins with a definition of Symmetria and how the concept may be used to derive the ideal proportions of the human form. In praising several of the great Greek artists of ancient times he mentions Polykleitos, the mid-5th century B.C. sculptor, on whose bronze figure, the Doryphoros (spear-bearer), Vitruvius probably based his ratios of human proportion. Vitruvius’ codification of these rules was the culmination of the “Greek aesthetic convention” of defining “the ideal proportions of the human body,” according to Smith. In establishing the relationship between architecture and the human form, Vitruvius unknowingly laid the basis for humanism and the Renaissance centuries before they flourished.

It was not only the interest in architectural theory that inspired imaginations—it was Vitruvius’ conception, based on ancient sources, that the proportions of the human form were the source and foundation of architecture. Thus, the beauty and genius of the early Italian Renaissance is that the human form was seen as the measure of all things. It became the visual framework for order and harmony in all art, while the proportions of the human form were rationalized into the ideal figures of the circle and the square and became the basis of architectural design in both religious and public buildings. Art historian Eve Borsook explains, “The faith in the human intellect and the joyous celebration of the figure were all understood as the best way of expressing divinity,” and it was this belief that “constituted the optimism of the Quattrocento.”

The concept, however, had its roots even prior to the 1400s. As early as the 11th century, the mystic Hildegard von Bingen understood and knew of the human/architectural connection in Vitruvius, for she wrote that “the height of a man is equal to his breadth when his arms and hands are extended on both sides from his chest,” just as, she goes on to explain, “the human figure is...interpreted as a mirror of the cosmos...[quoting Vitruvius] ‘for in like manner the firmament has its length equal to its breadth.’” In essence, the human body is a microcosm of the divine universe as a macrocosm.

Further evidence of the human form as a basis for architectural proportions is found in the work of another early author, Cennino Cennini. Although it is uncertain if Cennini had ever seen a copy of Vitruvius, it is clear that he understood and was familiar with Vitruvius’ theories on human proportion. Cennini’s lists of proportional relationships, his use of the tripartite divisions of the face, and his description of a man’s
height being equal to the width of his outstretched arms and hands in his famous early-14th-century handbook for artists and craftsmen are all theories originating with Vitruvius.

In fact, recent scholarship suggests that the Vitruvian text was well known by scholars from at least the 8th century, that its influence increased during the Middle Ages, and that its importance soared during the Renaissance “to a degree of fame that Vitruvius can hardly have dreamt of,” according to art historian Hanno-Walter Kruft. “The peculiar fate of Vitruvius’ treatise has been aptly characterized as follows: ‘In the history of art there is probably no other

example of a systematic textbook aiming at a contemporary influence, missing its target, and yet achieving such overwhelming success centuries after its appearance.’”

**LEONARDO’S DRAWING AS ILLUSTRATION OF THE VITRUVIAN TEXT**

In the Florentine studios of the 15th century it was common for artists and apprentices to meet with one another, discuss new theories on art, and share with or hide from one another new technical and evolving advances in art. Surely, something as important as the Vitruvian text was, by the mid-15th century, discussed and analyzed in the various intellectual and artistic circles not only all over Florence but also all over Italy. The manuscripts mentioned above, having been translated into the vernacular, must have spread like wildfire as copies were borrowed, shared, copied, and recopied.

In 1490 Francesco di Giorgio Martini arrived in Milan at the invitation of Ludovico Sforza to advise on the construction of the “lantern” for the Milan Cathedral. In that same year he traveled to Pavia, and Leonardo, who submitted drawings in the competition for the cathedral plan, traveled with him. It is possible that by this time Leonardo may have known about Francesco di Giorgio’s 1486 translation of Vitruvius and his illustrations for it, and if not, he certainly learned of it on their trip together to Pavia. Clearly the two had a great deal to discuss, for both men, at about the same time, were immersed in an attempt to understand and to illustrate the famous Vitruvian passage. We also know that Leonardo either intended or began to write a book on the human figure in 1489, and it may be that some of his investigations could have started even earlier, as some of the pages exploring human proportions in the *Codex Atlanticus* may date to as early as 1483. In any case, Leonardo’s interpretation of the Vitruvian passage goes far beyond that of Francesco di Giorgio, and indeed, beyond all other illustrations that follow.

Francesco di Giorgio’s version is accompanied by two drawings inscribing the male figure in a circle and a square. In one drawing, the circle is enclosed by the square, and the figure stretches his arms and hands out beyond the circle to touch the sides of the square. In the second drawing, the figure again stretches out his arms and hands while encompassed in the circle, but this time the circle projects outside the perimeter of the sides of the square and corresponds to the top and bottom of the square. Francesco di Giorgio accomplished this by making the height of the square greater than the width of
the square, therefore turning the square into a rectangle.

Leonardo’s drawing solves the problem by establishing the figure within the confines of the square then superimposing the circle over the square and using the male figure’s umbilicus as the center of not the figure but the circle. He also adds a second set of arms and a second set of legs on the same figure. It is an entirely different interpretation of the Vitruvian text and solves the visual problems inherent in the text within the economy of a single drawing. Leonardo literally thought “outside the box.”

The drawing by Leonardo measures 13½ x 9¾ inches and is executed in light brown watered ink on a soft, warm, gray paper. The paper is not quite square, and the edges are frayed and damaged. It is one of the earliest of Leonardo’s drawings on human proportion and was done during his first Milanese period, around 1490. His text divides Vitruvius’ information into three paragraphs, not entirely in the order established by Vitruvius. The writing was obviously added after the drawing was completed—the paragraphs conform to the width of the square, and a portion of the first paragraph is written in such a way as to conform to the top of the circle.

During my visit to the Gallerie dell’Accademia, in Venice, in the summer of 2007, I discovered two aspects of the drawing not observable in reproduction. Another drawing, or at least a sketch, must have been made prior to the final drawing because one can clearly make out, impressed deeply into the paper on both the recto and verso sides of the drawing, the incised lines made by a stylus. These incised lines conform perfectly to the outline of the figure as well as to the edges of some of the large muscle groups, particularly evident in the legs. In addition, there are tiny pinholes in the drawing marking the essential intersecting points. These are evident at the intersections of the circle and the square, at the corners of the square, in the places where the tips of the middle fingers of each of the four hands touch the square and the circle, at the marks of the segments of the fingers and the palms along the measuring line at the bottom of the drawing, at various other points on the face and the torso, and most important, in the very center—the umbilicus. The initial drawing had to have been laid over the final sheet and pierced with a pin to mark the essential points. Then the sketch was incised with a stylus and the impression passed through the top sheet to the sheet below it. The inked lines were then added, so perfect and complete there is a sense that the drawing was done only after thorough and careful preparation, the kind of preparation used for presentation or instructional purposes.

In the first paragraph above The Vitruvian Man drawing [see the translation in the Drawing blog on www.myAmericanArtist.com], Leonardo describes how nature has determined the proportional measurements of the human body by using small parts of the body as modules to define larger parts of the body. Referring to the ledger at the bottom of the drawing before the beginning of the second and third paragraphs, he says that “4 fingers make 1 palm, and 4 palms make 1 foot, 6
palms make 1 cubit; 4 cubits make a man’s height.” The entire first paragraph is a careful description of his drawing, which suggests the drawing was done first. He ends the first section of the text by inscribing his famous male figure in a circle using the navel as the center of the compass.

The second paragraph, a single sentence, is written below the entire drawing, including the measuring line, and establishes that the height of the figure, from the soles of the feet to the top of the head, is equal to his perfectly horizontal, outstretched arms and hands. This is defined by the sides of a perfect square. In the third and final paragraph, Leonardo sums up all of the major variables of anatomical modules used to measure the whole figure. He describes how each module is used as a canon to discover the proportional ratio of that part in relation to the whole height of a man.

The genius of the drawing is that after establishing the height of a man as equal to the width of his outstretched arms in a perfect square, Leonardo then draws the circumference of the circle along the bottom edge of the square using the man’s umbilicus as the compass point. The circle then passes outside the square and crosses over the square at the upper corners, and a second set of outstretched arms pivot up, without any distortion, until they reach the point where the tips of the fingers touch the intersection of the circle and the top line of the square at the exact height of the man. Leonardo does the same thing with the second set of legs spread out on the circumference of the circle, thereby creating a perfect equilateral triangle.

The impact of the drawing, along with the body of the text, is intended as something far more meaningful than mere illustration or decoration. Leonardo’s ability to thoroughly understand and digest the deeper meaning of the Vitruvian text is evident by the clarity of the drawing. Using his own language—the visual language of drawing—Leonardo was able to do what others had failed to do. By visually combining in one drawing the figure in the square and the figure in the circle, he gave movement and meaning to Vitruvius’ words. The poetic synthesis linking the combined figures of the circle and the square creates a harmony of such universal proportion that the visual image allows for instant recognition and clear comprehension of the meaning behind the words. In some ways the drawing represents the very beginning of Leonardo’s investigations into human proportions, and in other ways it seems to represent the culmination of those investigations.

Whether it is understood as the beginning of or the basis for a theory of human proportion, Leonardo’s search continued for many more years in an effort to either prove or elaborate on what he learned from Vitruvius. But in what finer way could his lifelong effort be epitomized than in his beautifully eloquent and most famous drawing, *The Vitruvian Man*?