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An Introduction to the Art of Leonardo

Robert Baldwin

Associate Professor of Art History

Connecticut College

New London, CT 06320

robert.baldwin@conncoll.edu

www.socialhistoryofart.com

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LEONARDO: PROFESSIONAL AMBITION AND THE ARTIST AS GOD-LIKE THINKER

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The New Renaissance Science as Empirical Reason and “Natural Philosophy”

To comprehend Leonardo’s originality historically, we need to look beyond the nineteenth-century Romantic myth of Leonardo the genius, the man “ahead of his times”, the brilliant inventor and scientist. Since Leonardo was unfamiliar with Latin, the language of Renaissance science, he was excluded from most published scientific discussion. Indeed, he avoided the world of scientific discussion by writing all of his scientific observations backwards in private notebooks which never circulated. The truth about Leonardo the inventor is that he invented nothing and contributed nothing to Renaissance science except for the world of medical anatomy. Here his many anatomical drawings set a new standard for empirical observation and detail which transformed anatomical drawing and inspired the illustrations to the first published work of Renaissance anatomy (Vesalius). He also developed new ideas in military technology though nothing ever came of his unpublished, paper “inventions”.

Despite his ignorance of Latin, Leonardo knew a great deal about basic science, especially the world of anatomy. He was also interested in technology. Having spent most of his career working in Renaissance courts, he had many opportunities to learn directly from the scientists and “engineers” of other day and from humanists with an interest in what was then called “natural philosophy”.

This explains two features of Leonardo the scientist. Most of his scientific thinking recycled traditional ideas and offered little or nothing new. On the other hand, Leonardo embraced a new, empirically-grounded, Renaissance scientific culture spreading in the late fifteenth and early sixteenth century. This new culture defined truth in humanistic terms as something apprehended by human reason studying nature empirically. It rejected traditional ideas of knowledge as something received from lofty authorities, whether old and untested scientific authorities like Aristotle and Galen, or Christian theological authorities where truth came from metaphysical speculation, divine revelation, miracles, and faith. Like many other believers in the new scientific values, Leonardo also distinguished between true science and pseudo-science such as magic, alchemy, and necromancy.

We might reformulate the nineteenth-century idea of Leonardo as a genius – i.e. a mind outside of its time or “ahead of its time” – with a more accurate historical view locating him in a new humanist scientific culture seen after 1470. What is most “original” about Leonardo’s scientific mind is not the conventional thinking it reflected, but that it existed in an artist and took on such a comprehensive range of subject matter.

While the Early Renaissance produced a few highly intellectual artists, notably Piero, Mantegna, and above all, the architect and humanist, Alberti, Leonardo redefined the Renaissance notion of the artist as thinker. Driven by a restless, wide-ranging scientific, technological, and engineering curiosity, Leonardo pursued studies into anatomy, geology, botany, geography, engineering, architecture, military fortifications, sculpture, music, literature, and painting.

This wide array of interests was unified by a "scientific" investigation of the natural world, a quest for practical knowledge rooted in the common systems, principles, and "laws" of nature. Research into principles of movement, for example, connected Leonardo's drawings of avian anatomy, flight technology, gear systems, water patterns, human anatomy, rhetorical faces and bodies, and a new sense of aesthetic vitality expressed in dramatic forms moving in rounded, fluid rhythms. Most of his investigations were grounded in what one could call applied science, in fields such as medicine, military technology, transportation, and engineering.

Even as an unoriginal summary of existing knowledge, Leonardo's wide-ranging studies, drawings, and voluminous notebooks were completely unprecedented for an artist, or for that matter, for anyone else in his day. And even if most of his science was conventional, his "research" into the natural world and into technology broke new ground in two areas – in anatomical drawing and technological-military engineering. Though many of his “inventions” remained fanciful and impractical, realized only on paper - they showed an original mind using experiment and observation to investigate new possibilities in science and engineering. To use his own words, artists were now “men who are inventors and interpreters between Nature and Man”.ⁱ

Leonardo's Greatest Contribution: The Image as Idea

Leonardo's greatest originality lay in his ability to transform visual representation into a respectable medium of scientific knowledge. As he wrote in discussing human anatomy,

And you who think to reveal the figure of man in words, with his limbs arranged in all their different attitudes, banish the idea from you, for the more minute your description the more you will confuse the mind of the reader and the more you will lead him away from the knowledge of the thing described. It is necessary therefore for you to represent and describe.ⁱⁱ

By using drawings to investigate the natural world scientifically and to record the results of these studies, Leonardo helped make the image into a worthy medium for knowledge and intellectual inquiry. As Henri Zerner has written,

Leonardo da Vinci was convinced of the power of vision as an instrument of knowledge. He felt that it was above all through our eyes that we grasp and understand the world, that visual representation is the primary method of recording knowledge, and, most importantly, that such knowledge enables us to master and control our environment. The Scholastic tradition of the later Middle Ages gave a privileged status to abstraction, to the manipulation of concepts. By giving priority to experience - especially visual experience - and experimentation, Leonardo announced a new era in Western culture. Between the sixteenth and the nineteenth century, the development of science was intimately linked to vision, because the visible could efficiently be recorded.

...

He saw a close relation between visual perception, imagination, and dreams. [In his notebooks he asked,] "Why does the eye see a thing more vividly in dreams than with the imagination when awake"?

It is clear that if visual perception was the foundation of knowledge, perception by itself was not the whole of vision. Imagination, the power of the mind to produce images, to give visual form to its conceptions, was also crucial. This power was applied to both the perception of the physical world and to the fantasies of the mind to which it gave equally vivid and convincing form. It was this visualizing power of the mind and its

representation in drawing and painting that gave unity to knowledge. For Leonardo, fantastic dreamer and scientist, there was no art without science or science without art. ... Beyond science, however, Leonardo wanted to give to the representation of the world, whether real or not, the vividness of a dream. This is what gives his art, whether a drawing of leaves or grass or the eddies of a river, or the Virgin with Saint Anne, its unmatched poetic quality. ⁱⁱⁱ

The Study of Nature and the Inventions of Artistic Mind

Leonardo's work was noteworthy in part for its search for nature's laws and general principles within the particular "bodies" of natural forms. These forms encompassed everything found in the natural world including geological, botanical, zoological, and human forms. Every single thing which Leonardo drew, from leaves to animals to rocks to human figures, became a potential microcosm, something whose deeper, hidden ties to nature's larger principles could be made visible by scientific study and by the mind of the knowledgeable artist.

By trying to master both empirical particulars and general principles, artistic creation could for the first time claim for itself a god-like conceptual quality in its omniscient range, its deep comprehension, and its infinite creativity or *fantasia*, its power of imaginary vision. The artistic mastery of both visible particulars and hidden principles also allowed Leonardo to invent wholly imaginary creatures and landscape settings which were nonetheless plausible and compelling. Examples include his drawings of dragons, geographical or topographical views from the heavens, caricatures, and imaginary landscape settings like those seen in the *Virgin of the Rocks* and the *Mona Lisa*. As Leonardo wrote in his extensive notebooks,

"Painting is a matter of greater mental analysis, of greater skill, and more marvelous [than sculpture] since necessity compels the mind of the painter to transform itself into the very mind of nature, to become an interpreter between nature and art. Painting justifies by reference to nature the reasons of the pictures which follow its laws ...

This art comprises and includes within itself all visible things such as colors and their diminution which the poverty of sculpture cannot include. Painting represents transparent objects but the sculptor will show you the shapes of natural objects without artifice. The painter ... shows you mists through which visual images penetrate with difficulty; he shows you rain which discloses itself behind clouds with mountains and valleys ... he shows streams of greater or lesser density; ... he shows the polished pebbles of various colors lying on the washed sand on the bottom of rivers, surrounded by green plants; he shows the stars at various heights above us, and thus he achieves innumerable effects which sculpture cannot attain.

If the painter wishes to see beauties which will enamor him, he is the lord of their production, and if he wishes to see monstrous things which frighten or those which are buffoonish and laughable or truly compassionate, he is their lord and god. And if he wishes to generate scenes, deserts or shady and cool places in hot weather, he portrays them, and similarly hot places in cold weather. If he wants valleys, if he wishes to disclose broad meadows from high mountains, and if he wishes afterwards to see the horizon of the sea, he is lord of them; similarly if he wishes to see high mountains from low valleys or the low valleys and sea shores from high mountains. And in effect, that which is in the universe by essence, presence, or imagination he has it first in his mind and then in his hands, and these are of such excellence that in a given time they will generate a proportional harmony in a single glance".

Drawing "from Nature" and the Mind of Artistic Perception

Until the mid-fifteenth century, drawing played a relatively minor role in art and, with a few minor exceptions, was generally confined to the making of pattern books. These were collections of sketches of well-known compositions for different subjects. Pattern books also included sketches of individual figures, costumes, and motifs. In this way, artists stored up a personal repertoire of visual forms which could be used or transformed in their own works. Only a handful of fifteenth-century artists went beyond pattern books to study the natural world more carefully and even these efforts were relatively modest compared to Leonardo's production of drawings. With Leonardo, drawing took on a new and more complex role central

to the new art he developed. Among other things, three features of the new role of drawing deserve comment.

Drawing as Scientific Observation and Investigation

First, drawing was the means to study the world "scientifically" in great and precise detail and to record and "publish" the results of that study artistically. With its rapidity of execution and potential for rhythmic line, drawing also allowed Leonardo to study certain features of nature for the first time and to recreate them in the separate language of two-dimensional artistic form. These features included momentary, changing effects of light and color and more general rhythmic patterns of movement and moving bodies. The latter is clear in Leonardo's many studies of rushing water.

As always, Leonardo searched for general principles of movement which could be productively transferred to other areas such as machines and gear technology or the aesthetic world of pictorial composition to create a new sense of vitality and overall unity.

Leonardo's interest in cosmic movement as a unifying principle of nature inspired his numerous drawings of flowing water. In water, Leonardo saw the "blood" of nature flowing through all matter in an endless series of cycles. Water also helped Leonardo transform art with a flowing, watery aesthetic of spatial and compositional movement akin to the emotional life surging through his dramatic bodies or his dynamic, unifying atmosphere of light and dark. Like the drawings of flowing plants and grasses, the study of water helped Leonardo develop a larger watery compositional flow, an organic rhythm animating all living things and uniting them with each other and their natural settings. The rocky crevasses and rivers in Leonardo's imaginary landscapes represented a cosmic, wet, fertile, animated earth whose watery "veins" nourished new life.

It is the property of water that it constitutes the vital humor of this arid earth; and the cause which moves it through its ramified veins, against the natural course of heavy

*matters, is the same property which moves the humors in every species of animal body. But that which crowns our wonder in contemplating it is, that it rises from the utmost depths of the seas to the highest tops of the mountains, and flowing from the opened veins returns to the low seas; then once more, and with extreme swiftness, it mounts again and returns by the same descent, thus rising from the inside to the outside, and going round from the lowest to the highest, from whence it rushes down in a natural course. Thus by these two movements combined in a constant circulation, it travels through the veins of the earth.*¹

In another passage, Leonardo made water exemplify a larger, cosmic principle of growth.

*Nothing originates in a spot where there is no sentient, vegetable and rational life; feathers grow upon birds and are changed every year; hairs grow upon animals and are changed every year; excepting some parts like the hairs of the beard in lions, cats and their like. The grass grows in the fields, and the leaves on the trees, and every year they are, in great part, renewed. So that we might say that the earth has a spirit of growth; that its flesh is the soil, its bones the arrangement and connection of the rocks of which the mountains are composed, its cartilage the tufa, and its blood the springs of water. The pool of blood which lies round the heart is the ocean, and its breathing, and the increase and decrease of the blood in the pulses, is represented in the earth by the flow and ebb of the sea; and the heat of the spirit of the world is the fire which pervades the earth, and the seat of the vegetative soul is in the fires, which in many parts of the earth find vent in baths and mines of sulphur, and in volcanoes, as at Mount Aetna in Sicily, and in many other places.*²

In contrast to its lesser place in traditional hierarchies of the four elements, which move down from fire to air to water to earth, Leonardo gave water a primary importance. This was true scientifically, in so far as water and blood flowed upward to the highest peaks (according to Leonardo), and symbolically, in so far as water's flowing, organic unity represented a cosmic vitality, symmetry, circular harmony, and wholeness seen throughout Leonardo's art. It was also true aesthetically in Leonardo's new artistic world where everything flowed within larger, unifying rhythms. The connections between small and the large forms, between an observed nature and a poetic cosmos glimpsed by the artist's "godlike mind," also explain the similarities between Leonardo's scientific water studies and his late drawings depicting the Apocalypse.

¹ Richter, Dover, vol. 2, p. 197, no. 965

² Richter, Dover, vol. 2, pp. 220-221, no. 1000

Both sets of drawings affirm a divine mind ordering the universe and endowing even its final, violent destruction with a divine symmetry, harmony, and order.

As seen in his studies of human physiognomy and of animals, Leonardo's drawings also explored nature as a series of infinitely varied particulars where changes of gender, age, and even animal type played themselves out in subtle differences across a spectrum. While many drawings played with the binary contrasts and "opposites" of nature: old and young, angry and tranquil, male and female, Leonardo was equally interested in the intermediate zones between opposites, especially with respect to gender. In his drawings where multiple human faces appear with minor adjustments and changes creating male, female, and indeterminate faces, Leonardo studied the subtleties and complexities of gender. A similar interest in the transitional areas between distinct types appeared in his animal drawings where passionate animal faces could gradually take on human form and vice versa, or where cats could metamorphose into panthers or even feline dragons. In this sense, all of Leonardo's drawings of natural forms, whether empirical or imaginative, helped him develop for Renaissance art a more varied, rich, subtle, and ambiguous language of natural form. Through minor adjustments to gesture, expression, and pose, the god-like artist could spin out an infinity of related forms within a full spectrum of nature.

Drawing as Scientific-Poetic Mind

If we use empirical language to describe Leonardo's drawings as "scientific observations," we risk losing sight of the role of invention or *fantasia* in perception itself. Rather than simply capturing objective qualities in the natural world around him, Leonardo's drawings selectively sought out certain qualities of the natural world which could be enhance a new visual rhetoric serving an autonomous yet "natural" artistic world devised in his imagination. By working from nature's particulars to its underlying principles, the artist could unleash a new inventive power, based on nature's hidden laws. As he wrote in his notebooks,

"This is the true rule how observers of natural effects must proceed: while nature begins with reasons and ends in experience, we must follow the reverse [path], beginning with experience and with that investigating the reasons." ^{iv}

One might say that Leonardo's drawings studied nature while transforming it into a higher imaginary or poetic world whose observed details made it true empirically even as its poetic reconfiguration endowed it with a deeper, philosophical, scientific, and spiritual truth. In contrast to medieval theological ideas which often criticized artistic representation as being artificial, deceptive, and therefore "false," Leonardo insisted in his writings that artifice paradoxically allowed art to convey "truth". Artifice now signaled the artist's divine mind.

This thinking was grounded in earlier Renaissance aesthetics and pushed fifteenth-century concepts further. After all, the system of one point perspective was tied a sense of artistic vision which was both deceptive (illusionistic) and imbedded in a higher, divine reason. It allowed artists to depict a plausible world and to capture visually a hidden, mathematical reality, a higher, sacred order governing the natural world. When Leonardo praised the artifice of painting as a sign of its higher, godlike mind, he extended a cultural process of redefining illusionistic images begun by Giotto, Lorenzetti, and Masaccio. Henceforth, European aesthetics would see in artistic "naturalism" a deeper understanding of nature transcending the perception of surface appearance. At the very moment when Renaissance art theory began praising the artist as a "mirror" of nature, Leonardo insisted that art offered a higher mirroring of the mind's eye. In contrast to an ignorant mirror, art now depended on the godlike imagination of the artist.

The painter who draws merely by practice and by eye, without any reason, is like a mirror which copies everything placed in front of it without knowing about them." ^v

By targeting and poetically heightening certain patterns in the "natural" world, Leonardo's art made it easier for others to "see" such qualities in nature and for such qualities to appear as "natural". This included patrons and audiences on the one hand, and artists and writers on the other who could use Leonardo's art to paint and write about such "natural" qualities in new ways.

In a larger sense, Leonardo's new naturalism was part of an ongoing Renaissance culture of creative "seeing" which began with Giotto and continued all the way until the last attempt to make a new art grounded in perception: Impressionism. By "seeing" "nature" in new ways, Western artists and writers after 1300 ended up quietly redefining "nature". Without neglecting the fact that some things seen for the first time really were always out there, we can develop a much more subtle, historically rich, and critical sense of artistic "seeing" if we understand it as a more complex, creative process of projecting new values into "nature".

Even studied as "scientific observation," Leonardo's drawings show how "observation" was always driven by an active, thinking, interpreting mind looking for larger patterns and eager to find them. For example, Leonardo's anatomical drawings are not simple empirical records of the confusion of surgically opened bodies. Like the methodical dissection process itself, Leonardo's drawings analyzed nature, exploring different anatomical systems (skeletal, muscular, cardiovascular, and reproductive), the structure of the brain, and the neuroanatomy of seeing. For all their new and keen observation, Leonardo's anatomical drawings were less passive or neutral records than the outward expressions of an active, pondering, analyzing eye and mind.

In this sense, there was no clear distinction between observation and thought, science and invention, reality and idea, between drawings of many different kinds of cats, potentially seen from life, and purely fantastic creations such as the bobcat and dragon which appear amidst the feline creatures on one of his sheet of cat studies. Indeed, it is likely none of the cats on this sheet were drawn from life. They seem more like infinite variations on a theme, spun out of the artist's restless imagination and based on his knowledge of feline anatomy already developed in earlier drawings "from life".

The convergence of observation and creation also informs Leonardo's many sheets of physiognomic types and human types, male and female, old and young, beautiful and ugly, etc. All of these seem observed "from life" and in some sense they are, yet they are even more clearly the invention of his mind searching after general types, here the laws of human psychology and character. So too, the same fusion of seeing and invention appears in

Leonardo's lifetime search for hidden mathematical ratios in natural forms, human and animal, and in their artistically perfect counterparts.

The clearest example of this is his drawing commonly known as *Vitruvian Man* which tries to find the cosmic mathematical proportions of the beautiful human form. This sacred geometry for the body was explicitly described in the ancient Roman architectural writer, Vitruvius,^{vi} and in the works of Cicero quoted earlier in the section on Donatello. By trying to fit the ideal human form simultaneously into the most perfect, sacred geometric forms of circle and square, Leonardo's drawing translated into diagrammatic form the larger humanist quest for sanctity and divine order within the natural, terrestrial sphere. And it made visible the humanist idea of the body as a beautiful, orderly, purposeful microcosm.^{vii}

The Renaissance qualities of *Vitruvian Man* emerge more clearly when compared to a medieval depiction of the same subject in a manuscript by Hildegard of Bingen. The medieval image offers a Christian vision beyond this world seen in a moment of divine inspiration by the author who appears as a tiny figure in the lower left. Leonardo's drawing affirms the sanctity of the natural sphere and of human nature in particular. The medieval image is explicitly the Christian vision of a theologian-nun and appears in a Christian treatise. Leonardo's drawing is based directly on a pagan, Roman architectural treatise and offers a more secular worldview. The medieval image affirms the higher reason of God and the gift of divine inspiration. The Renaissance drawing offers an original philosophical image which implicitly affirms the divine power of the human mind in general and the inventiveness of Leonardo in particular. The more secular aspects of Leonardo's drawing emerge still more clearly if we see in all of his drawings an implicit expression of the divine beauty, harmony, order, reason, and purpose of the natural world. In this sense, every aspect of nature can be seen as a microcosm, not just the human body but also the bodies of animals, plants, landscapes, and swirling streams of water.

Incidentally, this drawing showed that the naturally proportioned human form could *not* fit simultaneously into an overlapped circle and square. Looking more closely, Leonardo discovered that anatomical realities and humanist philosophical metaphors did not always match up (though they retained a powerful poetic appeal as metaphor).

We should also note that none of the many sixteenth and seventeenth drawings and prints of this "Vitruvian Man" ever showed a woman. When mapping out the divine, mathematical order of the human figure, a "rational" male human being was required. If bodily mankind was to acquire divine status, a male body was needed in accord with classical, medieval, and Renaissance philosophy and science. With few exceptions, Western writers defined women as a lesser humanity, a flawed, less rational, secondary nature more tied to body, feeling, and instinct. When Renaissance culture deified female figures, it reinforced traditional gender hierarchies by sanctifying women as divinely fertile bodies, as microcosms of a larger Mother Nature. Male human beings resembled god on a higher level through their god-like reason.

Drawing as Artistic Process: Art as Self-Conscious Thought

Leonardo was the first artist to use drawings as tools for thinking not just about nature but also about art. By drawing and redrawing lines one over the other, Leonardo transformed drawing into the key tool by which artists could reinvent their subjects, exploring new possibilities in composition, lighting, or minute particulars. Each of these particulars, in turn, could be expanded into the subject of a separate drawing with its own, new, still more detailed particulars. In this sense, Leonardo's use of drawing signaled the new infinity of the artist's potential knowledge, his or her ability to research into endlessly smaller microcosms and to invest every artistic choice with a wide range of potential meaning and reference encompassing scientific, philosophical, ethical and religious concerns.

The making of art became thus much more complex, difficult, and inventive. Each commission, each represented subject offered the artist an infinite series of expressive possibilities which drawing could discover or invent, each with its own qualities of meaning. The artist was only limited by his or her knowledge, imagination, and technical skill. The making of art through a long process of drawing (thinking) became an experimental, self-critical process and the final product the culmination of a series of visual studies, spun out of the artist's mind. If each line drawn on top of earlier lines in Leonardo's often "messy" drawings signaled a new possibility and a critique of the one before it, so too each of Leonardo's paintings critiqued and

"improved" (or at least varied) on its predecessor. Henceforth artistic thinking became as important as execution, if not more so. Within thirty years, artists like Raphael restructured the artist's workshop in ways which clarified the new distinction between execution and invention. As the busy master, Raphael made drawings or artistic ideas which were then handed over to talented assistants for execution as paintings. And by hiring professional printmakers, Raphael publicized his drawings in the form of prints, circulating his artistic ideas rapidly throughout all of Europe.

Sfumato, Oil Painting, and the Representation of the Unknown ^{viii}

If Leonardo's use of drawings transformed the process by which works of art were made (and the training of artists, henceforth taught to draw from life), so too he transformed painting techniques in Italy by shifting from egg tempera to oil painting and by developing a uniquely atmospheric style of lighting known as *sfumato* (Italian for smoke).

With its much greater translucence and potential for subtle blending, oil painting offered a more luminous, glowing color, a deeper, more natural-looking, atmospheric space, a new way to harmonize space and surface through tonal gradations, and a new unity of composition subordinating the minute particulars of fifteenth-century Italian painting to the larger, simplifying tonal patterns of sixteenth-century art. In this way, the new scientifically studied details which gave Leonardo's pictures a new sense of life didn't clutter up his pictures or interfere with the powerful simplicity of three dimensional form and composition.

As *sfumato*, the new oil technique contributed to Leonardo's sense of painting as a highly complex and potentially infinite series of problems, choices, and difficulties. Once the mimicking of nature's perceptual infinity and subtlety became a goal, the technique of oil painting became similarly infinite and open-ended.

The space produced by the new oil painting appealed for more than its convincing aerial qualities, atmospheric depth, and aesthetic unity. For Leonardo's *sfumato* also produced a new, visible sense of mystery and infinity, an endlessness which surrounded and dissolved all things and immersed them in a larger totality. As Alexander Nagel put it, Leonardo's *sfumato* worked to saturate the known with the unknown. In more secular, humanist terms, Leonardo's *sfumato* imaged a new open-endedness to perception and knowledge consistent with the artist's wide-ranging scientific inquiries. Conversely, the mysterious shadow heightened the viewer's consciousness of the limits of human perception and knowledge in the face of nature's new infinity and endlessness.^{ix}

In many ways, Leonardo's oil technique and *sfumato* lighting paralleled the new, watery rhythms which dissolved the movements of individual figures into larger compositional flows. *Sfumato* also dramatized space by making it into a changing but unified atmosphere of lights and darks dissolving harmoniously into each other. Like his cosmic "watery" rhythms and space-creating dramatic forms, *sfumato* helped Leonardo move Renaissance naturalism beyond the static, geometric spaces of fifteenth century perspective boxes. Nature took on a more organic spirituality as something open, flowing, "living", and eternal.

By creating space through dramatic figures, flowing compositions, and smoky, infinite spaces, Leonardo also avoided another problem of one point perspective: the tension between surface and depth. In fifteenth-century perspective spaces, space moves backward along receding lines toward the vanishing point while important figures remained confined to foreground where they can retain size and visual prominence. Figures placed within the perspective space resemble chess pieces placed on a board and moving independently of each other. This is especially true with the egg tempera medium used in fifteenth-century Italy which cannot create atmospheric effects or spaces. In fifteenth-century perspective paintings, the space between forms looks static and dead, a void between forms rather than a living continuum. Leonardo moved beyond these limitations by adopting oil painting and creating elastic spaces unified by moving, rhythmically linked forms and areas of tone. This new dramatic-rhythmical pictorial form added immeasurably to the new vitality and life of the "High" Renaissance style.

Sfumato, Affective Piety, and Nature's Rhetoric

Nagel's analysis of Leonardo's *sfumato* can be extended if we connect the novel, visual expression of sacred mystery with the affective piety of the late Middle Ages and Renaissance. This was the period when complex Latin theology centered in the monastery and university gave way to a new, urban lay piety grounded primarily in feeling and personal devotions. This devotional piety translated the traditional Christian mysteries of Incarnation, Passion, and Redemption into a new, empirical world of human feeling and expressive bodies. From this came the emotionally-rich Passion and Marian piety of the fourteenth, fifteenth, and sixteenth centuries.

No artist of the late Middle Ages or Renaissance did more to study and extend the artistic expression of feeling than Leonardo. Among the hundreds of drawings investigating different aspects of the natural world, Leonardo used dozens of sheets to explore a wide range of emotions. Some of Leonardo's drawings focused on extreme states of feeling such as the fierce, masculine anger imaged in studies for the *Battle of Anghiari* or the snarling faces developed for old men and women in his ground-breaking caricatures, or the "bestial passions" explored in Leonardo's animal studies. Other drawings studied more subtle, delicate and ambiguous emotions as seen in his sketches of young women and androgynous men. All of these preparatory studies helped Leonardo break from the bland, repetitive faces and bodies seen in late fifteenth-century Italian art and pioneer a new variety, subtlety, depth, and intensity of human emotion.

As an artistic technique, Leonardo's *sfumato* advanced the new expression of feeling by inventing a painterly rhetoric of light and dark which was evocative, poetic and deeply mysterious yet grounded in a plausible and familiar nature. It was this fusion of the rhetorically abstract and the natural, the spiritual and the terrestrial, the medieval Christian mystery and the Renaissance empirical world, which gave Leonardo's *sfumato* its expressive power and artistic appeal at a particular historical and cultural moment.

Until the thirteenth century, Christian mysteries had traditionally been expressed through the elite literary device of paradox – the speechless, infant Christ as the Word, the tiny baby as the

creator of the cosmos, the Virgin mother as the daughter of her son, and so on. While clever theological paradoxes continued as an element in the devotional piety of the later Middle Ages and Renaissance, the new lay piety focused more on arousing feeling than on religious instruction and invested heavily in the emotionally-charged rhetoric of the body. Like Christian defenses of “carnal” images in church worship, the feeling, suffering, loving body worked to arouse a deeper, emotional understanding of the mysteries of the Incarnation and Passion and the more deeply imbedded, affective piety of *Imitatio Christi* and Marian compassion.

It is this turn to a new, emotionally-charged bodily piety which helps explain the appeal and impact of Leonardo’s *sfumato*. As an artistic device tied to the rousing of religious feeling, Leonardo’s *sfumato* turned away from the esoteric theological diagrams and allegories seen on the façades of Gothic cathedrals or in the more intellectual world of monastic decoration such as the mid-fourteenth century allegories in the cloister of Santa Maria Novella in Florence. Instead of allegorical instruction, Leonardo’s art offered an intensely dramatic world of emotionally-charged figures imbedded in a mysteriously shadowed universe as deep as it was infinite. It shifted the ground of sacred mystery away from abstract theological concepts, allegories, and otherworldly medieval abstraction in favor of natural settings and bodies. In this, it followed the arc of late medieval spirituality since the twelfth century which redefined Christianity with the rhetoric of nature, human nature, and human feeling.

At the same time, Leonardo’s art was profoundly rooted in a new Renaissance humanistic mentality which rejected or downplayed important medieval Christian values, especially monastic inwardness, retreat and *contemptus mundi* (contempt for the world). As a rhetorical device aimed at arousing strong feelings, Leonardo’s *sfumato* was effective in new humanist terms because *sfumato* was nature’s rhetoric. It represented and clarified nature’s transcendent order in which all living things and experiences and values were imbedded. As an expressive device, *sfumato* helped reveal nature’s hidden mysteries and universal principles no less than did the “divine” beauty and carefully studied proportions of Leonardo’s forms.

Seen this way, Leonardo’s *sfumato* represented a partial break with medieval affective piety in offering a new secularizing of the sacred. Here it parallels Leonardo’s secular, scientific drawings of the Apocalypse which replace supernatural angels with trumpets, horsemen of death, and showers of blood with more natural disasters such as earthquakes and floods

imaged on a grand scale. By replacing traditional gold leaf and sacred allegorizing with mysterious, poetic lighting, Leonardo developed a more secular artistic language for the sacred. And in so far as Leonardo's *sfumato* sanctified everything in the natural sphere, it helped open the way for the rise of secular subjects, especially landscape and still-life.

In the case of portraiture, Leonardo's trademark *sfumato* also helped him endow an ordinary burgher woman such as Lisa Gherardini with a microcosmic grandeur, majesty, humanist dignity, and emotional mystery. Here we might compare the *sfumato* landscape and the subtle smile as two rhetorical devices used to spiritualize and deepen the humanity of an ordinary burgher woman. On the one hand, the invention of a cosmic *sfumato* landscape transformed this ordinary woman into a feminine "microcosm" displaying human nature at its best: intelligent, rational, serene, orderly, and virtuous with mind harmoniously at ease with beautiful, fertile body. By making a burgher woman without courtly clothes or jewelry into an example of the perfect "little world," Leonardo flattered her with the "inner nobility" prized by Florentine burgher humanism

Seen as an emotionally expressive device to deepen her humanity, Leonardo's mysterious *sfumato* combined beautifully with an equally mysterious smile of striking subtlety and ambiguity. The smile breaking gently on the face of the "celestial" beloved offered a parallel, bodily language of sacred feeling tied to the mystery of love which had been increasingly redefined in feminine term since the troubadours and Dante. This smile of sacred love and mystery first appeared on the face of Mary at the portals of thirteenth-century Gothic cathedrals where it offered a human expression of Divine Love redefined in late medieval terms as an interceding, forcing, redeeming feminine love. Common in the conventional world of the late medieval Beautiful Madonna, the fixed, frozen smile of Mary was studied from life in the Renaissance and reemerged as a more natural smile in late fifteenth-century Florentine art, most notably in Rossellino (Victoria and Albert Museum), Verrocchio (Bargello), and Leonardo. No artist painted more smiling Madonnas than Leonardo nor did any other artist project Mary's tender, forgiving, redeeming smile onto as many other women. Leonardo who used it repeatedly for St Anne, for nymphs, for a Leda, and a portrait of a young, unmarried woman from Florence.

Like Leonardo's many smiling Madonnas and St. Annes and even more like the smiling, loving, redeeming Beatrice – the celestial beloved frequently described in Dante's Paradiso, Leonardo's *Mona Lisa* displays the smile of a mysterious and sacred love first discovered in Mary and quickly projected onto a variety of other "celestial" women after 1300.

The Artifice of Sfumato and of Leonardo's Naturalism

If the *sfumato* oil technique allowed new aspects of nature to be captured while concealing the artful brushstrokes in a seamless spectrum of tonal light, it also heightened the perceived artifice of Leonardo's painting, its remarkable and utterly original system of representation. Here the technical artifice of Leonardo's art joined with its self-referential, explicit inventiveness, (described above in the section on drawing and representation as active invention). It was no coincidence that sixteenth century aesthetic theory, responding directly and indirectly to Leonardo's art, formulated and codified new ideas on art as an autonomous realm, a separate aesthetic sphere with its own qualities, freedoms, and laws. In this sense, modern thinking on art owes much to the impact of Leonardo. Leonardo himself claimed that painting could only be fully understood by other painters.

The New Myth of Artistic Freedom and Autonomy

By the mid-sixteenth century, the new ideas on art were commonly applied to leading painters, sculptors, and architects throughout Italy and, increasingly, in Northern Europe. Needless to say, such values played a key role in raising the social and economic status of artists and in liberating them from guild restrictions. By redefining art as a noble, intellectual, original, and free or autonomous activity, the new artistic theory of the Renaissance, developed extensively first by Alberti and taken further by Leonardo, adopted humanistic versions of courtly hierarchies of noble mind over ignoble body, liberal over mechanical arts, intellectual leisure and freedom over degrading material necessities and labor. The new artist possessed and

displayed a "true" nobility, i.e., a humanistic internal nobility grounded in education and virtue. Leonardo even described himself in such terms as the ideal artist who worked not as a menial craftsman but rather as an educated, beautifully dressed gentleman listening to court music and poetry while he painted.

One consequence of the new idea of the "artist", still alive today, was a new freedom from guild restrictions for the best sixteenth-century artists. They were free to work for courtly elites and, with prints, for anonymous art markets. Some of the best artists even set up independent studios where high patrons would visit to commission works. And Titian even managed to market himself internationally to a variety of monarchs and emperors. There was also, for the very best artists, a relative freedom vis a vis the high court patrons they slavishly flattered in so far as these patrons were more willing to allow artists some choice in subject matter and interpretation. At the same time, the best artists continued to be absorbed into a dominant court culture where they had, at best, a relative autonomy. And all of the subjects they so "freely" chose were carefully selected and interpreted to flatter their princely patrons, assure future commissions, or win permanent appointments at court with lodging and food, annual stipends, and tax breaks.

Seen from within a society dominated by courtly and humanist elites, the new idea of art did indeed "liberate" the best artists from the menial position of craftsmen and from restrictive guild regulations and relocate them to a nobler world of "free" mind. Seen more critically from outside this narrow courtly and humanist social framework, the very "freedom" and "dignity" claimed by some sixteenth-century Renaissance artists was itself imprisoned in courtly mythologies of social hierarchy where one person's freedom depended on another's debased servitude. The Renaissance artist was free and respectable because he or she could now look down contemptuously on masons and carpenters and all other anonymous, exploited, unimportant people. From a modern democratic perspective, it is not clear this new social position was admirable or "free" except in its own narrow world. In the end, Renaissance artistic freedom and autonomy remained wholly defined by the much larger court and humanist culture in which it worked and whose values it had eagerly adopted in claiming a new dignity.

Leonardo and Court Culture

Leonardo first made his reputation in Florence in the 1470s and was snapped up by Lorenzo de' Medici around 1480. In 1482, Lorenzo sent Leonardo and a talented musician as "gifts" to the powerful court of Milan headed by the Sforza family. Except for a five year stint in republican Florence during the Medici exile (1503-8) where he began a huge fresco in the town all commemorating a Florentine military victory, Leonardo spent most of his career in the service of various courts, above all, the Sforza and Borgia courts of Milan, the d'Este court in Mantua, the Medici papal court in Rome (1513-16) and the French court of Francis I where he died (1517-19).^x

In part, all of these courts saw him as an artistic and intellectual trophy whose presence could add new luster to their reputation. These courts also hoped to use Leonardo to create permanent artistic monuments to their glory and perhaps even bring them the historical fame humanists credited to literature and art. In Leonardo's case, he worked on a variety of court projects including portraits, allegories, emblematic palace decorations, a huge, unfinished equestrian sculpture of Francesco Sforza as a triumphant "Roman" emperor, and courtly festivities such as the *Paradise with Seven Revolving Planets* which Leonardo designed and choreographed for a Sforza-Aragon wedding in 1490.

Court patrons were also eager to exploit Leonardo's technical skill in military engineering, fortification architecture, weapons, and armor, a subject of numerous drawings. This, too, is another side of Renaissance art and architecture which has come under greater scrutiny in the last ten years with the new social and political history of art. For Renaissance observers, fortification architecture was one of the major areas of modern architectural accomplishments and one where princely patrons could look back, with humanist eyes, to the pride of the ancient Romans in the military arts. A typical expression was Ficino's hymn to the Golden Age of modern humanism

"... accomplishing what had been revered among the ancients, it united wisdom with eloquence, and prudence with the military arts."

Even more telling was the letter Leonardo wrote to the Sforza court of Milan advertising his various talents. Two points are worth making here. First, painting and sculpture appeared only as minor elements within the much more important artistry of war. Second, Leonardo offered

an explicitly political kind of painting and sculpture capable of representing the glorious power of the Sforza and of bringing them the much sought, humanist fame in later history.

MOST ILLUSTRIOUS LORD, - Having now sufficiently considered the specimens of all those who proclaim themselves skilled contrivers of war, and that the invention and operation of the said instruments are nothing different to those in common use: I shall endeavor, without prejudice to anyone else, to explain myself to your Excellency, showing your Lordship my secrets....

I have a sort of extremely light and strong bridges, adapted to be most easily carried, and with them you may pursue, and at the any time flee from the enemy; and others, secure and indestructible by fire and battle, easy and convenient to lift and place. Also method of burning and destroying those of the enemy.

I know how, when a place is besieged, to take water out of the trenches, and make endless variety of bridges, and covered ways and ladders, and other machines pertaining to such expeditions.

If, by reason of the height of the banks, or the strength of the place and its position, it is impossible, when besieging a place, to avail oneself of the plan of bombardment, I have methods of destroying every rock or other fortress, even if it were founded on a rock, etc.

Again, I have kinds of mortars; most convenient and easy to carry; and with these I can fling small stones almost resembling a storm; and with the smoke of these cause great terror to the enemy, to his great detriment and confusion.

And if the fight should be at sea I have kinds of many machines most efficient for offence and defence; and vessels which will resist the attack of the largest guns and powder and fumes.

I have means by secret and tortuous mines and ways, made without noise to reach a designated [spot], even if it were needed to pass under a trench or a river.

I will make covered chariots, safe and unattackable, which, entering among the enemy, with their artillery, there is no body of men so great but they would break them. And behind these, infantry could follow quite unhurt and without any hindrance.

In case of need I will make big guns, mortars, and light ordnance of fine and useful forms, out of the common type.

Where the operation of bombardment might fall, I would contrive catapults, mangonels, trabocchi and other machines of marvelous efficacy and not in common use. And in short, according to the variety of cases, I can contrive various and endless means of offence and defense.

In time of peace I believe I can give perfect satisfaction and to the equal of any other in architecture and the composition of buildings, public and private; and in guiding water from one place to another.

I can carry out sculpture in marble, bronze, or clay, and also I can do in painting whatever may be done, as well as any other, be he whom he may.

Again, the bronze horse may be taken in hand, which is to be the immortal glory and eternal honor of the prince your father of happy memory, and of the illustrious house of Sforza.^{xi}

The "bronze horse" was the planned "Roman" triumphal monument depicting an equestrian Sforza trampling a defeated enemy, a familiar triumphal image from relief

ⁱ *Notebooks*, Dover ed. vol. 1, p. 15

ⁱⁱ quoted in Heydenreich's monograph on Leonardo, p. 123, and again in Erwin Panofsky, "Artist, Scientist, Genius: Notes on the Renaissance Dammerung," in *The Renaissance: Six Essays*, NY: Harper, 1962, pp. 145-146, .

ⁱⁱⁱ^v^{vi} Add text

^{vii} While cosmological drawings placing the human figure in a circle and square were known in the middle ages, they usually appeared in manuscript editions of Vitruvius, in medical treatises, or cosmological and scientific writings. In contrast, Renaissance artists like Leonardo, Durer, and others made drawings on the theme of "Vitruvian Man" as part of a new humanistic interest in nature and the human body, not as illustrations to texts. These drawings were also part of a comprehensive new study of the natural world exploring sacred mathematical ratios in all sorts of lesser bodies such as animals. Nothing like this exists in the middle ages where the human figure in circle and square generally represented the divinity of human reason, not the sacred order of terrestrial mind *and* body and of all living things.

^{viii} This paragraph draws heavily on Alexander Nagel, "Leonardo and Chiaroscuro," *Res*, 24, 1993. Nagel sees Leonardo's *sfumato* as a paradoxical finishing of the unfinished. .

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