



TRADITIONAL OIL PAINTING

ADVANCED TECHNIQUES *and* CONCEPTS
from the RENAISSANCE *to the* PRESENT

VIRGIL ELLIOTT



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AUTHOR'S NOTE

THERE ARE JUST A FEW POINTS that I feel should be made in the interest of clarification before the reader launches into the book proper, if I may be indulged the use of the first-person singular for just a bit. It was my initial intention to write the text of this book as clearly and descriptively as possible, so that there would be no need for a great many pictorial illustrations to put my points across, and to use examples from the greatest oil painters throughout art history, as many as my budget would allow, as illustrations for the points mentioned in the text. My own artistic contributions to the book, as I had originally envisioned it, were to be limited to demonstrations for which I could find no ideal examples in the works of the Masters, such as in step-by-step illustrations of some of the techniques mentioned. However, my editors have prevailed upon me to include not only more step-by-step illustrations than I had originally planned but also images of some of my own finished paintings. At their insistence I have done so, but reluctantly. I do not wish to appear so presumptuous or disrespectful of the great Masters as to put forth my own artworks as examples of excellence, I assure you, or to expect them to compare favorably to the greatest paintings of the greatest artists of all time. That situation could well serve to show me in a less than favorable light, to say the least, as it surely would with most living artists. The reader is thus provided some basis for evaluating the degree to which the author understands his subject, at least, and that is always an important consideration to be taken into account whenever one reads anything pertaining to art.

But to return to the paintings of the great Masters, in particular the ones shown in this book as illustrations: the reader is encouraged to consider all of the points raised in the text when looking at each of these paintings, and not just the point or points next to which the images appear. These paintings serve as excellent examples of many of the points covered or at least touched upon in the various

chapters of this book, yet it would present tremendous logistical and practical difficulties to reproduce each painting multiple times throughout the book whenever a principle or point raised in the text might bear on it, or vice versa. In fact, I will extend my recommendation to include not only the paintings reproduced in this book but all of the great paintings one can find in museums all over the world and in private collections and galleries, wherever the reader can gain access to them. However one can manage to do so, by all means go to those museums, all of them, make whatever sacrifices might be necessary to make it possible, and allow as much time as possible to study the great artworks wherever they can be seen. Reproductions are not a satisfactory substitute for standing before masterpieces and taking in the full impression of the originals with one's own eyes. Every serious artist should make these pilgrimages throughout his or her career, to charge and recharge the artistic batteries and keep the inspiration level high. There is much to be learned from the great Masters, and it is there to be read in their paintings. It is my hope that this book will help people understand a bit more about what they are seeing when they look at the paintings of the great artists throughout the history of oil painting, to provide some insight and some points to look for and consider. It would be unrealistic to expect any book to suffice to convey all of what can be learned from looking at and visually analyzing great art. The best we can hope for is that this one can serve as a guide to aid in the understanding of great masterpieces and what makes them great masterpieces, while one is looking at them and studying them firsthand.

I will stress the importance of placing greater emphasis on what we get from the artworks in direct viewing than on any words we might read about them, no matter who wrote them, and of paying particular heed to the impressions we get directly from the paintings themselves. For a work of art should stand on its own merits – or fail on its own shortcomings if it does not succeed in registering favorably upon the viewer's sensibilities, irrespective of what might have been written about it. The individual's quality receptors above all should be the determining authority in establishing an artwork's status in each person's estimation. Quality is really the central issue, as it must be where art is concerned. Surely the greatest benefit art can provide to society is to uphold the banner of quality and never let it be lost sight of or forgotten.

Having expressed those important points as well as I am able with the humility and imperfect medium of words, I will now abandon the use of the first-person singular for the rest of this book, since the book is not about me, and close this address with a quote of my own authorship from 1987, so win:

"The human psyche includes many intricate qualities beyond the influence of fashion. Art that reaches there will endure."

KIRCH, ELIOTT
Palo Alto, California, 2020



ATTITUDES, HELPFUL *and* HARMFUL

IN MOST LARGE CITIES in the United States and Europe, there is at least one art museum in which can be seen, first-hand, oil paintings executed in centuries past by some of the greatest artists who ever lived. Upon viewing the best of these paintings, no one who has ever tried to paint can help but experience a profound sense of awe. The illusion of reality is so convincing in so many of these works that the subjects seem alive, about to move, about to speak. The textures depicted are so realistically rendered that it seems we could reach into the picture and feel the satin, velvet, brass, gold, or whatever is indicated, so skillful were these artists at creating their illusions.

The Old Masters, the Dutch "Little Masters," and the best of the French academic painters of the nineteenth century carried oil painting to a higher pinnacle of technical perfection.¹ Viewing their works is sure to instill a degree of humility in virtually any painter below Matisse level. "How did they do it?" is the inescapable question. How is it possible that mortal human beings, with a few simple paints and brushes, were able to create such lifelike illusions on flat canvases or panels so long ago?

For artists and seeing artists, this experience is surely universal. One cannot help but be profoundly attracted by it. But the ways in which people react to it, as regards their own personal motivations, tend to differ significantly from that point onward. One major school of thought concludes that the work of

Caption

Detail of *La Toque* (French, 1660-1665),
St. Joseph the Carpenter, 1660, oil on canvas,
100 x 120 cm, Louvre, Paris

Detail of *La Toque* (see above) showing the man's shirt,
influenced by Caravaggio, particularly in the use
of chiaroscuro, i.e., dramatic contrasts between
light and dark to make soft edges

Photo credit: 2020 / Art & Architecture

the Old Masters, et al., is so sublime that to attempt to rival it is an exercise in futility, and possibly a form of artistic heresy. Often, those holding that view abandon any ambition they might have had of becoming painters in a realistic mode themselves and go on to pursue other artistic directions or other vocations. There are some, however, who become so inspired by what they have seen that a spark is ignited, an obsession kindled, which compels them to seek out the knowledge needed to create their own paintings, paintings that will, hopefully, instill a similar sense of awe in all who view them. This book is written for those who choose to pursue that goal.

In centuries past, the path for those obsessed individuals was fairly well laid out. Prior to the twentieth century, there was no shortage of well-trained artists, and most of them accepted students. Art was taught by artists, and many of the discoveries of each generation were passed along to the next. Anyone with an interest in and some aptitude for art could study with a Master, other circumstances permitting. The standards were not at all confusing as to who was, and who was not, a Master. It was apparent in the work. Artists' guilds, whose memberships were restricted to professional artists, called "Masters," conferred the status of Master on aspiring artists who had been well trained and could demonstrate mastery of the medium. Only a Master could go into the business of teaching art. No one believed for a moment that there was any point in studying with anyone other than a Master anyway. As Masters were available, the course was clear.

Things are not so cut-and-dried in modern times, as the reader has probably already discovered. There is still no shortage of teachers, but the requirement that one possess a high degree of technical ability to obtain a teaching position has somehow been lost. Furthermore, the distinction of Master has been conferred on so many graduate students (recipients of *Master of Fine Arts* degrees), and people who call themselves artists but whose skills are well below those of Masters of centuries past, that the word "master" has lost its meaning. One result of this is that the general level of art instruction suffered immeasurably during the twentieth century and has yet to recover to any appreciable degree into the twenty-first.¹ Too many aspiring or would-be artists have been either thwarted entirely or at least been severely hindered in the quest for the specific knowledge they sought—knowledge that would have enabled them to paint up to the standards once universally acknowledged as requisite for the designation "artist"—by the lack of art instruction comparable in quality to what was available prior to the twentieth century. As a consequence, there are precious few truly well-trained artists in existence today.

There is no reason to believe that proper instruction cannot still produce painters of ability equal to the great painters of the past. They were humans, not gods—extraordinarily talented humans, to be sure, but not beyond the range of possibilities of people today. Their works can surely be rivaled, and

perhaps surpassed, by artists of high intelligence and dedication, given sufficient study and diligent effort. Mental discipline is not an attribute unique to men and women of the past, although it is sometimes tempting to entertain such a premise.

The creative spirit must acknowledge no limitations in its drive to create great art. Destructive influences are everywhere. Many popular notions, attitudes, and fashions are detrimental to creative achievement, and the artist must recognize and conscientiously avoid them.

Most people are predisposed to failure by the wrong attitude. "I wish I could do that, but I can't," is a familiar saying, and a pathetic one. In many cases, the only reason someone cannot do a given thing is the belief that he or she cannot. Because the person believes it to be hopeless, no serious attempt is made. Erase that belief, and most people would be surprised at what they can actually accomplish. People tend to accept unrealistic assessments of their abilities without putting them to the test and seem to feel that if they cannot do something well the first time they try, they must simply have no aptitude for that particular thing and therefore cannot learn to do it well no matter how hard they might try. It is symptomatic of mental laziness.

Another harmful influence is the social convention that compels us to feign humility, to pretend that we are less than we are, in order to be well liked. The danger in such self-deprecation is that it becomes all too easy to fall into the trap of believing it. This may well be a contributing cause of the "I could never do that" attitude. It is destructive, from an artist's standpoint, because it denies reality. Arbitrary notions of one's personal limitations are rarely realistic. How desirable a quality is humility, or the appearance of it, faked in the interest of popularity, if it inhibits one from wholeheartedly pursuing worthy achievements, greatness, excellence? It must be recognized as potentially detrimental to an artist. Confidence is necessary to proceed in any worthwhile endeavor. Self-doubt can prevent one from making that first breakthrough.

Self-reliance is an essential attitude an artist must cultivate. One's own judgment must reign supreme over all other influences. Each work of art is, and should be, the individual expression of the unique artist who created it. Thousands of decisions must be made in the conception and execution of each painting. We cannot expect to create a masterpiece merely by following some step-by-step procedure prescribed by someone else. As students, these things are helpful, but as artists we must think our way through each painting, from beginning to end. The entire load is on us. The responsibility for the result, whether it be credit or blame, is ours to bear alone. It is common for people to look to authorities for guidance, and this is appropriate to some degree for students, but there is the danger of developing too heavy a reliance on the judgment of others, which can occur all too easily when one's instructor is highly accomplished and/or well respected and is overbearing in his or her teaching.

We must not relinquish our responsibility for what we are doing in deference to any authority, or our individuality and artistic integrity are in danger of becoming submerged or compromised, and we will then remain in the shadow of our mentor. The best artists have always surpassed their instructors. It is well to aspire to leave the nest and fly on our own, to soar to new heights, once we have mastered the basics with the help of our teachers (or without it, if that is the case).

An artist must possess the ability to be totally objective and should reject anything that interferes with the clear and objective perception of reality. Negative presumptions regarding one's abilities should not be entertained. As William Blake said so aptly: "If the sun and moon should doubt, They'd immediately go out." If evidence exists to support them, we should not presume that the limitations indicated are insurmountable. The fact that something is not easy does not justify the conclusion that it is impossible.

There is a common tendency to focus too narrowly on one particular kind of picture. Landscape, portrait, and still life are the most popular choices. All of these are given coverage in this book; however, the idea of neglecting any one of them in favor of whichever might happen to be our favorite should be emphatically discouraged, until we have learned to do them all well. Although the reader's interest in one particular genre may be keen, it must be recognized as a mistake to pursue a specialty niche before one has mastered all aspects of realistic drawing and painting. The result is always, and will always be, weak work that does no credit to its creator or to art as a whole. An artist should be well-rounded enough to paint any subject with authority. The same skills, powers of observation, and ability to design and execute a well-composed scene are required in all of these disciplines, if good results are the objective. And indeed excellent results ought to be the ultimate objective, if we really care about art. It is wise for portrait painters to master still life and landscape painting as well, because there will be other things in their pictures besides people, and those people may well want to be depicted out-of-doors. If those things and settings are not painted up to a high standard, the quality of the painting will suffer. In landscape painting, we face many of the same issues. There will sometimes be objects in the foreground plane that will require still-life skills to render convincingly. And the human figure in a landscape can provide reference for scale and, most important, can add visual interest. These possibilities are denied the landscape painter who has neglected to study the human form.

We cannot expect quality results from less than a wholehearted effort. An artist's life must be arranged around art, and anything that detracts or does not contribute must be sacrificed, if the highest degree of excellence is the goal. This includes attitudes and modes of thought as well as counterproductive personal and familial relationships, environments, and lifestyles. There are



likely to be trials, tests of resolve, and temptations to abandon the pursuit of high achievement in art for a more comfortable situation. There is no guarantee that every artist who perseveres will reach his or her goal. What is certain is that those who do not will definitely fail.

Great art will not be created by the dilettante. Excellence in any endeavor will only be attained by those who simply will not accept anything less.

MICHELANGELO MERISI DA CARAVAGGIO
1593-1594, *The Boy with a Basket of Fruit*, oil on egg tempera on canvas, 55 1/2 x 37 1/2 inches, National Gallery, London.

Caravaggio is known to have worked from painted models. It was with a single light source in order to achieve the striking naturalism that makes him a controversial figure in art history.

<https://www.nationalgallery.org.uk/paintings/michelangelo-merisi-da-caravaggio-the-boy-with-a-basket-of-fruit>



AESTHETIC CONSIDERATIONS

ALTHOUGH THIS BOOK DEVOTES a great deal of attention to techniques and materials, it would be a serious mistake to assume that that's all there is to great art. All the technique in the world cannot guarantee that an artist can be great if he or she has nothing to say. Great art depends heavily on content. It touches us emotionally, conveying a feeling directly from the artist to the viewer. No explanation from a third party is necessary. It tells its own story, or perhaps only suggests one, engaging the viewer's imagination and creating some degree of intrigue, showing us glimpses of fascinating worlds, which may exist only in the mind of the artist. It is magic.

But, as magicians know, magic is illusion, created by someone with a thorough working knowledge of the craft of illusion-making. Magicians begin with an idea, the illusion they would like to create; then, using very non-magical analytical thinking, they devise a way to make it happen. We are fascinated by the illusion partly because we are ignorant of the mechanics involved in creating it.

Painting is also a process of creating illusions. The artist creates the illusion of three-dimensions and depth on a two-dimensional surface. A flat canvas or panel is transformed into space occupied by objects, or even people, with personalities, emotions, character—all done, not with mirrors but with paints and brushes, by one who has mastered the craft. Without mastery of technique, the most inspired individual cannot communicate creatively beyond a local level. Technique is a tool. It is not the whole of art, but it is a very essential part.

Opposite:

JOHANNES VERMÉER (Dutch, 1632–1691), *The Astronomer*, 1654–55, oil on canvas, 47 1/2 x 35 1/2 inches, Kunsthistorisches Museum, Vienna

With a few exceptions, Vermeer's greatest work, like the mastery of three-dimensional composition, geometry, perspective, selective focus, and a variety of tones are rendered convincingly—all done without consciously or unconsciously. He discovered that, again, a study there is much to be learned from Vermeer. Masterpieces were probably used for studies in a workshop, to show work from direct observation, until it was time to pour the model for the girl's head and hands.

Photo Credit: Stock Imaging / Art Reference LLC

Art is valuable precisely because each artist is unique. Each has a story to tell, a point to make, a feeling to get across. This individuality is not taught in art schools, although instructors might encourage their students to find it. It cannot be gotten from books, seminars, seminars, or lectures. It is either already there, urging us just to find a way to express it, or it isn't, and it cannot be faked successfully. A good instructor can influence students in such a way as to draw out the individual differences to some degree, but a teacher's main job should be to teach the vocabulary and let each student decide what to say with it.

The falling of an entire art formative in one year is the overemphasis on expression and underemphasis on any method by which the expression may be executed. Without technique, the inspiration is trapped inside; it can't get out. Its message cannot be shared. Popularity cannot reward it. For all practical purposes, it does not exist. How frustrating it must be to have a great inspiration but lack the means to express it.

Style

Perhaps too much has been made of the need for originality and individual style in educational institutions offering art classes. In the early stages of an artist's development, it is more important to concentrate on mastering the skills that will be needed to facilitate self-expression. There is no real danger of an inspired individual with a strong personality losing any of his or her distinctive voice due to thorough training in the technical aspects of art-making. All too often, focusing too much on style and too little on skills results in a set of handicaps that place a too high on what a person can effectively express through art. These handicaps are sometimes equalled as if they were elements of a person's style, but that view is harmful and should not be encouraged.

It is indeed true that each artist's style is, and should be, unique; however, this idea is often used as an excuse for whatever is lacking in a given artist's technique. Style should be the result of choice, not of limitation. It should not be a concern at all for the student, whose primary goal must be to master every aspect of drawing and painting exactly what he or she sees, until it is all second nature. At that point, it might be appropriate to give consideration to what one's style is to be as a professional, but not until the basics have been learned and learned well. With a full range of choices available, any choice one makes is valid.

Style will evolve naturally. As in Zen, the direct pursuit of this goal is pointless. It will happen when it is Time. As Time will not be until all obstacles of ignorance and all limitations of technical ability have been removed, then it will be there, as it is always there in each of us, awaiting the development of our ability to recognize and express it. Until we have mastered every aspect of our medium, there will be things inside us that cannot be expressed. Those things are elements of each artist's individual style.





Composition

Composition in art is essentially the arrangement of intervals. The human brain reacts favorably to certain intervals, sequences, sounds, and shapes and unfavorably to others. Just as the composer of music must understand the influence of each musical possibility on the mood of the listener, so must the painter understand the psychological effect of the various possibilities of pictorial intervals in order to move the viewer in whatever way is desired. Intervals include distances between contours, increments of value contrast, and variations and interactions of colors—in fact, everything that goes into a work of visual art.

The most universally desired objective for a painter must surely be to arrest the viewer's attention and hold it as long as possible. The painting may well find itself on exhibit with many other paintings at one time or another—in a gallery, a competition, a private collection, or perhaps in a museum alongside the works of other great artists. In any case, we want our picture to dominate the wall. This may be accomplished in many ways. The most successful designs incorporate an area of primary interest, whose appeal must be effective at a fair distance in order to bring the viewer closer. Once the main focal point has been digested, a secondary point of interest, something of greater subtlety, should catch the eye and hold it a bit longer. Strategically arranged areas of secondary, and possibly even tertiary, interest should be orchestrated in such a way as to lead the eye from one point to the next and then back, eventually, to the area of primary interest.

Any compositional lines, intentional or otherwise, that lead the viewer's eye to the edge of the canvas are in effect leading it out of the picture and on to the next one, which is likely to be someone else's. The Great Masters always interrupt these lines with something to direct the viewer's eye back into the picture or diminish the focus and/or contrast so the line more or less dissolves before reaching the edge. As Western civilization teaches us to read from left to right, there is a tendency for the right border of a painting to exert a certain gravitational pull on the viewer's eye. It is therefore particularly important to avoid leading it to the right edge. Lines may lead into the picture from the bottom, if there are more than one, suggesting a sort of road guiding the eye to the area of primary interest, where the lines would converge if carried all the way in; but any line leading to the right edge will send the viewer out of the picture. The upper edge is likewise generally best avoided.

LINEAR ELEMENTS IN COMPOSITION

Lines and linear elements within a painting can add greatly to its appeal—or can ruin it, depending on the type of lines and how well they are employed. The most visually interesting lines are compound curves, or S shapes. Decreasing-radius curves are also pleasing. As a general rule, curves are more interesting than straight lines, diagonal lines are more appealing than verticals or horizontals, and straight lines that run horizontally are the least interesting linear element.

Previous spread

Copy by Gerson's (London) after *Stamandier* by Hieronymus van Bril's The White Company of Captain Frans Banning Cocq and Willem van Cutshuis (popularly known as *The Night Watch*), seventeenth century, dimensions unknown, oil on panel, The Rijksmuseum, Amsterdam.

This copy shows the elements of original composition before the painting was cut down in the eighteenth century when it was moved to the Amsterdam Town Hall, where the new wall was too small for it in its original form and (like the original) is it appears today's viewer on page 92.) Notice how the extended arm of the figure toward the right edge of the canvas successfully brings the eye back to the center of the composition.

Drapery

Drapería (Spanish) by the Studio of Velázquez (Spanish, 1660). The *Surrender of Breda*, (also known as *Las Casacas*), circa 1634–1635, oil on canvas, 100 × 110 (inches), Paris, Musée

Not only the way the lines are patterned to give to one another, and how the intervals between them vary, imagine how much less interesting they would be if they were all absolutely equal in one another and the same distance apart. The close intervals between the horizontal's the extreme right curve to deter the viewer's eye from exiting the picture. The turning of the horse's head to the left, and Velázquez's self-portrait looking away from the right, equally help to direct the viewer's gaze back to the scene. The angular intervals between the lines create a sort of rhythm, a sense of movement likewise with the positioning of the soldier's head. The diagonal bases points at to the main figure.

Photo Credit: Courtesy of The Metropolitan Art Library



Parallel lines are usually not visually interesting, but when opposed to one another a certain degree of irregularity, they can set up an exciting series of rhythms. Notable examples are the series in Velázquez's *Samuel and Isaac* and Benetton's *The Night Watch*.¹⁷ These paintings illustrate that the intervals between elements are at least equal in importance to the elements themselves. A final arrangement of intervals derives more from a sense of aesthetics than from any mathematical formula, although many attempts have been made to arrive at formulas to use as guidelines in their arrangement. This sense develops along with everything else an artist must learn in order to reach the higher levels. It is, simply put, a sense of what looks right and what does not.

There are, however, a few basic points that may bear noting here to help the reader. First, right angles are less interesting than other acute or obtuse angles. Second, tapered shapes are more pleasing to the eye than shapes of unchanging



thickens, nor do parallel lines are less aesthetically pleasing than those separated by diminishing or variable intervals. And, third, nature shows us very few truly straight lines. Given that fact, and the principles mentioned above, the artist would do well to carefully look for curvature in any line that appears to be straight and round or exaggerate that curvature. Straight lines are useful to "bring up" the curves, as they provide some variety to generate interest.

These principles are really just patterns that, for whatever reason, our brains react favorably to or unfavorably to, and the artist must be sensitive to which is which. Many attempts at analyzing these from scientific and mathematical viewpoints have been made over the centuries, and some of these have proven more successful than others. One of the more important of these mathematical studies follows.

THE GOLDEN MEAN

Within a rectangular space, there are zones of greater strength and areas of relative weakness. Focal points, areas of primary importance within a painting,

James Watson and Oliver Morgan (1934-1941). An Experiment on a Bird in the Air Pump, 1848. Oil on canvas, 21 x 26 inches. National Gallery, London.

The scientist finds a problem on the Golden Mean, as measured from the right edge of the picture. The face of the man in the right of center is on the Golden Mean, as measured from the left edge and from the bottom.

Photo credit: National Gallery, London.

gain added strength by being positioned at the strongest spots within the plane. These spots may be arrived at mathematically or intuitively. In one whose intuitive sense of composition is very good, the results of intuitive placement are likely to correspond to the mathematical device called the Golden Mean, or the Golden Section.

The Golden Mean is a proportion often found in nature and was probably first noticed by the ancient Greeks. It is based on the calculation by which a whole is divided into two parts of unequal size, the smaller of which is in the same proportion to the larger as the larger is to the whole. Finding the Golden Mean, or a close approximation of it, can be made somewhat simpler by using Fibonacci's Golden Number. Fibonacci's Golden Number, expressed as a decimal (rounded off to three places), is .618 of a given whole (or just under $\frac{1}{2}$, which is .625). There are more complicated methods of arriving at the same point, which are explained in the adjacent sidebar, but for artists' purposes, the decimal will most often suffice. It may be rounded off to .618 when working down from the whole to the next smaller segment or from a larger segment to the next smaller segment or rounded off to 1.618 when working up from a smaller segment to the next larger one.

Most artists are not mathematicians and need not approach problem solving in the same way as mathematicians, so long as their senses are finely enough attuned to what constitutes visually pleasing proportions and intervals to bring them to solutions that work. Indeed, visual judgment should always reign supreme in matters of art. However, for the sake of more complete understanding, it is helpful to know the mathematics involved. The artist whose visual acuity is precise will be able to find the Golden Mean without resorting to any measuring instruments other than his or her eyes and brain.

We see examples of this proportion everywhere—in the spacing of tree limbs, in the lobes of leaves, even in our own bodies. For instance, in the bones of our hands, beginning with the last segment of each finger, each bone is approximately .618 of the next larger bone, until we reach the wrist. In situations such as this, where there are multiple segments, we may begin with the largest segment and then multiply its dimension by .618 to get the dimension of the next segment, then move sequentially down the line following the same calculations. The second segment is .618 of the first segment, the third segment is .618 of the second, and the fourth is .618 of the third. Note that .618 is a rounded-off number; it is not precise. The actual numbers vary slightly after the first three places beyond the decimal point, working with multiple segments, so .618 is essentially an average.

The Golden Mean is seen so often in nature that it becomes part of our intuitive sense of proportion, and pictures composed using this principle are in greater harmony with this sense and thus are more visually pleasing. The strongest

Fibonacci's Golden Number

The thirteenth-century Italian mathematician Leonardo Fibonacci (also known as Leonardo of Pisa) gave the Western world Arabic numerals. He is also known for the mathematical ratio referred to as "Fibonacci's Golden Number," or the Golden Ratio. This ratio is arrived at by beginning with sequential numbers and then adding two contiguous numbers in the sequence to get the next number. For example, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987.

The ratio between each number and its preceding number varies slightly, but rounded off to three places beyond the decimal point it resolves to average 1.618. The exceptions are limited to the first few sequences: 1+1=2, 1+2=3, 5+3=8.66666, 8+5=13, 13+8=21.66666, 21+13=34.66666, 34+21=55.66666, 55+34=89.66666. From there on, it is 1.618, with less and less variation between the digits beyond 1.618. This ratio is a key proportion found in nature.

points within a rectangle are the points at which the Golden Mean from the vertical intersects with the Golden Mean from the horizontal. For example, if the dimensions of our canvas are 40 inches high by 30 inches wide, the Golden Mean of the vertical side will be 24.72 inches, arrived at by multiplying 40 by .618.⁴ The Golden Mean from the horizontal, or 30-inch, side would be 10 times .618, which is 18.54 inches. By marking the vertical side 24.72 inches from either the top or bottom, and then drawing a line from that point across our rectangle at ninety degrees (parallel to the horizontal edge), we establish the Golden Mean of the vertical dimension. Then, by measuring 18.54 inches across the top or bottom of the rectangle (the 30-inch side) and drawing a vertical line across the picture plane from that point, we establish the Golden Mean of the horizontal dimension.

The points at which the lines thus established intersect are the strongest points within this rectangle. Pictorial elements positioned on these points gain added force by such strategic placement. There are four such points within a rectangle. The upper left of these is generally the strongest, although the elements of a picture can be orchestrated in such a way as to add strength to any of the others as well. As previously noted, the Western mind is taught to read from left to right, and this accounts for the greater strength lying on the left. (This may not be true for someone brought up in a culture whose written language reads from right to left.) It is also possible to establish subdivisions within the overall picture plane, based on the Golden Mean, and then to divide each into smaller and smaller proportions, according to our intentions, and create a much more complex composition, ad infinitum.

As regards strong spots versus weak spots within a rectangle, the weakest of all is the absolute center, meaning the point at which an X composed of diagonals connecting the corners cross one another. A subject centered side-to-side can be made to work by placing the main focal point above the center. This is done in more formal compositions, in which stability or tranquility is emphasized by such symmetry, most often with a triangular arrangement, but greater dynamic possibilities begin by placing the main subject at least slightly off to one side.

THREE-DIMENSIONAL COMPOSITION

Although most discussions of pictorial composition deal with the canvas rectangle as a two-dimensional entity, it is possible and desirable to take into account the three-dimensional illusion created by the use of perspective and design our composition based on the space indicated, not just on the actual flat surface of the picture. Johannes Vermeer provides an excellent example of this in *The Art of Painting*. The viewer's eye is led into the picture along an S-shaped course: beginning outside the painting, sweeping past the foreground curtain on the left, to the artist seated at his easel, then back to the left, across the table with the white papers and the cast on it, to the brightly lit section of the wall and then rightward to the posed model. From there, the eye continues to the right

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