The Artist's Study of Nature and its Relationship to Goethean Science

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Poet and playwright Johann Wolfgang von Goethe's scientific studies grew out of a disenchantment with the reductionist science of his time. He believed a more accurate description of nature was possible. Goethe's scientific method paralleled the methodology of art current in his era, and very likely arose, at least in part, from pre-existing traditions of knowledge in the visual arts. The study of similarities between Goethe's scientific method and the methodology of art could provide insights into both disciplines, and insights into the intentions that drove Goethe's scientific studies.

"Art is the mysterious incarnation of the secrets of Nature."[1]

In 1786 the poet and playwright Johann Wolfgang von Goethe (1749-1832) left Weimar in haste, keeping his itinerary secret so as not to be called back, and set out for Italy in order to satisfy his "burning thirst for true art."[2] In Rome, he stayed with the painter Tischbein, who lived with two other painters, and he circulated among many other artists. Goethe immersed himself in the study of landscape and figure drawing with Heinrich Meyer.[3] Drawn to Naples by an eruption of Vesuvius, Goethe and Tischbien documented the event in the company of three other painters: Kniep, Philipp and Hackert.[4]

Upon his return to Germany in 1788, Goethe read a formal treatise on color and rejected it completely. He borrowed a case of optical equipment from a friend and began a study of color that would span 20 years until he published *Zur Farbenlehre* in 1810,[5] which he considered his most important work. Goethe's color theory, a refutation of Newton's mechanistic understanding of light, was largely dismissed by the scientists of his era, but has recently received much attention from scholars seeking a science of qualities that recognizes human participation in nature.[6]

Goethe's scientific studies grew out of an emotional disenchantment with the reductionist science of his time. He believed a more accurate description of nature was possible. Art, Goethe said, is the worthiest interpreter of Nature.[7] His scientific method paralleled the methodology of art current in his era, and very likely arose, at least in part, from pre-existing traditions of knowledge in the visual arts.

Janus Head, 10(1), 329-349.

The processes of art in Goethe's time differed drastically from 20th century conceptions of artistic practice, which embodied a rejection of traditional knowledge.[8] Some of the knowledge has survived the whims of modernism and offers a useful resource for 21st century inquiry into Goethean science.

Understanding the Sight-Size Method[9]

Sight-size exercise Patti C. de Santini, student at Atelier Sonorense

The photograph above shows an example of the first exercise my students do when they enter my atelier.[10] The student sets up a model, as closely as possible to a drawing board, taking care not to move the model or the board throughout the course of the exercise. The student stands several feet back from the model, and marks a position on the floor, so the model is always seen from exactly the same point of view. The student then draws a representation,[11] exactly the same size as the model, as seen from a fixed position. Moving one's eyes back and forth between the model and the drawing facilitates the observation of any difference in shape or tone. The difference "jumps," just as we perceive movement when comparing two consecutive frames of motion picture film.

Sight-size is an essential feature of atelier training, which has been remarkably successful in training painters.[12] The student who did the drawing above, for example, had never drawn before. She completed it in less than twenty hours—a rapid, though not very unusual rate of progress in ateliers.

The Study of Nature

"The Four Elements," oil on canvas Daan Hoekstra, 1985

The atelier tradition refers to the process of learning to see as "the study of nature." Nature, as an artist's term, means the visual world in its totality.[13] It is important to make the distinction between "the study of nature" and the highest objective of atelier training—painting imaginative works. It is held that a student must first master working from nature, before beginning to work from the imagination, which is much more difficult. If this discussion of atelier method seems to exclude imagination, it is because I am just addressing one element of atelier training.

Just as Goethe approached observation of nature with a few simple guidelines, atelier students are asked to keep a few ideas in mind when observing nature. The ideas are not at all imposed on nature, but instead are seen as guides to aid in the process of training the eye.[14]

Almost all the concepts I use when I teach the study of nature came from my teacher, Richard Lack. He learned them from his teacher, and so on, all the way back through the Boston School of Painters to Jean-Léon Gérôm, Paul Delaroche and Jacques-Louis David.[15] While it is hard to know precisely when an idea entered the tradition, the ancient origins of the concepts are recognizable.

The first, and perhaps the most important concept I ask my students to consider when they approach nature is: *1) Nature is the best model and truest teacher.* I tell my students, as my teacher told me, that nature, the world of visual appearances, is the real teacher. I am only a guide who points out certain facts and aspects of natural order. The students grasp nothing until they experience it through direct interaction with nature. The student constantly tests my words against the visual phenomena, so as not to impose an abstract structure on nature.[16]

In the atelier tradition, a full-time student normally spends at least 30 hours per week in the solitary study of nature, with just one or two hours per week in contact with the "instructor." A student is told to spend more time observing the model than looking at the drawing. The student must be in the constant presence of nature.[17]

One of the most useful principles used to help atelier students understand the visual world is: *2) Piecemeal observation results in distorted information.* Focusing on a part to the exclusion of the other parts and the whole interferes with an accurate understanding of interrelationships. Students must balance intense observation of parts with, at the very least, occasional glances at the whole, and consider the relationships between the parts and the whole. Similarly, Goethe believed that isolation of phenomena amounts to "wearing blinders."[18]

The belief that piecemeal observation yields inaccurate information dates back to ancient times, in the Jain parable of the blind men and the elephant, for example. Each of three blind men grasps a different part of the elephant's body and comes to a different conclusion about the nature of the whole animal.[19,20] The high degree of specialization and reductionism in the contemporary world has undervalued this basic principle about the nature of reality, but it plays an essential role in atelier training.

More principles traditionally used in atelier training follow:

3) Cultivate the naïve eye. Shut down the mind that symbolizes. Atelier students are trained to seek and cultivate a fresh eye. Since they often work on a single exercise for 80 hours, or more, maintaining a fresh eye helps them base their work solely on direct observation untainted by theory, abstraction or preconception. Students are reminded that intellectual thought interferes with the direct experience of observation.[21]

4) Artistic creation reconciles apparent opposites. Nature's structure to a large degree depends on a tension/balance between unity and diversity, order and chaos, repetition and variety, etc. Any human creation necessarily works with the same set of variables. Atelier students have to reconcile light and shadow, warm and cool, sharp and fuzzy, etc. Beginners invariably ask, "How?" Tradition obligates the instructor to answer, "Look at Nature and see how she does it." The instructor can say nothing more.

The idea that nature is composed of a reconciliation of opposites, and that this general structure can be used as a guide for human creations, was fundamental to Pythagorean music theory and to Sufism,[22] and became the very basis of the methodology of Western art. The ancient idea surfaced in Goethe's theory of science as the principle of polarity.[23]

As atelier students progress into the recognition of general patterns and structures within nature, eventually they experience an enormous shock. They will recognize the truth of inherited ideas about the structure of nature by actually *seeing* them in the world of visual appearances! Their vision will even go beyond the inherited knowledge and they will begin to find patterns, structures and meanings in the visual world on their own. It is a surprise and a great joy!

That moment liberates atelier students from the words of the instructor, as they realize that the guidelines received from tradition were themselves born in the study of nature. Until the student reaches this point, he will resist every word the instructor utters. The process can not be understood without first experiencing it.[24]

The Whole and the Parts

5) The whole is articulated in the parts and the parts reflect the nature of the whole.[25] This principle, not a part of atelier tradition, but one I added to the curriculum of my atelier, is a pattern I recognized in nature as an atelier student. The idea of self-similarity originates in the hermetic doctrines of macrocosm/microcosm, and appears in current holographic paradigms. As

an atelier student, I was shocked to notice that every framable portion of the visual world contains the same underlying patterns. Every framable portion of nature is a whole in itself. This may seem nonsensical at first, but, if we begin with the idea that our senses are our primary organs of knowledge, and we admit that our senses cannot take in the entire universe at once, any understanding of wholeness must necessarily be born in parts. The relationship of subparts to parts speaks of wholeness with fractal regularity, on any scale.

6) Start with a broad, general representation and work towards the details. Atelier training in naturalistic painting involves choosing a portion of the visual world. A still life, for example, may only involve 10 degrees of my 120 degree peripheral vision. A part of the visual world is framed, then, and chosen as a theme for a painting. Since the part contains other parts, it is understood as a whole unto itself. When the atelier tradition refers to the whole and the parts, then, the whole refers to the entire framed portion of the visual world, and the parts refer to parts within the framed portion.

Since maintaining unity is one of the most difficult aspects of drawing or painting, we start as broadly as possible, stepping back to get a general impression of the whole, which is itself a part. If parts are pursued in isolation, as if severed from the whole, the representation of the whole is always inaccurate. One must begin with a broad fuzzy rendering, and alternate between observing the parts and observing the whole. The start retains fuzziness as a way of delaying the final decisions—a way to avoid imposing a premature impression of the whole on the parts. Only later can the parts be examined in detail. The unity of the parts in relation to the whole is far more important.

One gradually sees that any framable portion of nature contains wholeness and exhibits patterns of relationship between the parts and the whole that echo any other portion of nature that might be framed. All is a study of light, shadow and color. This leads to an experiential understanding of the following principle from tradition:

7) Nothing exists except in relationship to everything else. Everything exists only in relationship to everything else. If nature is an organic unity, nothing can be understood without keeping this principle in mind. The atelier provides an ideal kind of laboratory in which the truth of this principle can be experienced. Shapes, colors and tones are perceived differently depending on what is next to them.

Experiential learning of this sort results in a degree of certainty many times greater than that which comes from abstract knowledge. This certainty is much more viscerally linked to the emotions.

The Master Copy and the Study of Nature

Copy of Vermeer's Girl in a Red Hat, oil on panel Daan Hoekstra, 1988-1992

In the Ecole des Beaux-Arts of 19th century France, copies were a mandatory and respected part of the curriculum, from the elementary level to the advanced. Copies were even a part of the process of arriving at original compositions.[26] Beginning students often copied engravings for a year or two prior to working from life, all as a prerequisite to entering the Ecole. Albert Boime went as far as to say that the "reverence for the old masters and the ritualistic approach to copying (in the Ecole) can be linked to a form of sympathetic magic." Students sought to make contact with the knowledge and outstanding qualities of the masters.[27]

I approached the experience of copying Rembrandt, Vermeer, and George Inness with simpler, yet clearly-defined objectives—I wanted to copy the original to the best of my ability and learn from the experience. I found it impossible to do a good copy without feeling that I had to navigate some of the labyrinths the original painter had to travel, and solve the same problems, in the order in which he had to deal with them, in essence retracing his decision-making process. Copying takes a painter on a tour through the thought of a master to a much greater degree than simply looking at a picture.

Turning my attention back to nature brought the most valuable outcome. If copying the old masters offers me some degree of access to the thought processes of the original artist, what can I learn when painting in the presence of living nature? If the universe is a living whole, a union of nature and humanity, as Goethe believed, then surely it contains knowledge accessible through the much misunderstood practice of *mimesis*.[28]

Mimesis aims at distilling the order and beauty of nature—at connecting with nature's intelligence and uncovering her secrets. Seen as a process rather than a product,[29] art infuses the artist with an experiential understanding of relationships and patterns in nature. Seen as a practice, the objectives of atelier training are almost identical to those of Goethean science. Both traditions give birth to trained eyes. Trained eyes, in turn, lead to insights into the workings of nature.

Understanding, insight itself, is the goal of Goethean science. Perhaps the greatest indicator of Goethe's genius was in his poetic method of expressing that insight in words—symbols—while meticulously minimizing abstraction. Naturalistic art, then, is more about a similar intention of minimizing abstraction, rather than copying nature.

Rudolph Steiner, a pioneer in his investigations of the relationship between art and Goethean science, argued that a Goethean approach to art would not result in naturalistic art, but a free expression of the underlying patterns of nature.[30] While Steiner wrote down his ideas the artworld was going through an enormous transformation—serious study of nature was abandoned, with very few exceptions.[31] Goethe told us to remain with the phenomenon, which is itself the theory, just as the atelier "instructor" tells the student that nature is the real teacher. Abstractions of abstractions overwhelm our culture and our perception of nature, so a balance needs to be restored.[32] The abstractions rarely, if ever, contain the beauty, subtlety, complexity and depth of natural phenomena because they are not born of a serious experiential study of nature. I look for nothing behind appearances because I find inexhaustible meaning in appearances themselves.

The objective of science, and perhaps any search for the truth, is to describe nature in such a way that the description is, as much as possible within the limitations imposed by symbols and thought, precisely identical to nature.[33]

Figure Study, charcoal on paper Daan Hoekstra, 1986

The Human Figure and Naturalism

In the first elementary exercises, atelier students draw objects from life using the sight-size method. Working from plaster casts of Greek sculpture offers an introduction to human form, but here in Mexico casts are costly and hard to obtain. I found that stones and bricks work just as well—they introduce organic form.

The fastest student only advances into figure drawing after at least 100 hours of observation of objects that most people (but maybe not Goethe) would consider inanimate. In the process, most students recognize the incredible beauty of form, light and shadow, and develop a kind of sympathy with the object. The sympathy and perception of beauty intensifies when one begins to work from a living human being. Imagine suddenly staring at a person after staring at a stone for a hundred hours!

When children begin to draw the human figure, they instinctively look for simple geometric shapes. The head becomes a circle, the nose a triangle, the torso a trapezoid and the limbs straight lines, for example. Children seem to be natural platonic idealists, finding ideal forms behind the phenomena.[34]

The tendency to search for geometric and mathematical relationships behind the phenomena has led to some great art. Islamic sacred geometry, for example, is an exquisite expression of order in the cosmos, which recognizes the beautiful interconnectedness of an organic universe, expresses its unity, and speaks of its most universal patterns.[35] For millennia people have found patterns in nature. The helices of seashells, the hexagons in honeycombs and the golden mean are just a few examples. Some authors such as Matila Ghyka have published in-depth studies of the patterns.

The atelier tradition avoids all this because it refuses to impose abstract formulae on the phenomena. My experience as an atelier student did not even include a study of linear perspective.[36]

In spite of my great respect for Islamic sacred geometry, my atelier training tells me that it does not resemble the phenomenal world. Ordinary visual experience contains more asymmetry, randomness and complexity—in a word, more chaos. If nature displays a balance between order and chaos, Islamic art is pure order, to the exclusion of chaos. The infinite range between razor sharp and fuzzy membranes is missing too.

Fern leaves are a favorite example of natural symmetry. My patio is full of ferns, but I see little symmetry. The leaves twist and turn on their axis,

they spring upward or droop. In order to get a fern leaf to be symmetrical, I would have to torture and kill it—cut it and press it between planes of glass. I cannot see the fern leaves without the light that filters through the mango tree above them, a cacophony of chaos in itself—a tangle of branches and leaves, though not without order. The light that reaches the ferns dapples them randomly, illuminating some parts and leaving others lost in mysterious shadow. If the light doesn't reach them, they die. In order to paint a living fern, then, I need to paint random spots of light revealing parts of fractal forms twisted out of symmetry, simultaneously conveying their irregularity and imperfection while recognizing their fractal regularity. More often than not, the everyday phenomenal world is messy.

Similarly, a perfect human face seen head-on looks symmetrical. Its profile is asymmetrical. We can walk around it and view it from 360 degrees. Only two of those 360 angles offer a symmetrical view—less than 1%. While a figure model can be coerced into an unnatural position in order to be seen as symmetrical, the everyday visual phenomenon of the human figure is never symmetrical. Limbs bend comfortably and asymmetrically.

My atelier training has given me a deep distrust of simplifying phenomena into abstract formulae. Much beauty is lost in the reduction. The atelier approach to human figure, while rejecting most conventional systems of proportion, doesn't object to starting out with a lightly sketched, erasable, oblong sphere for a head, and irregular cylinders for limbs, but it quickly acknowledges irregularity, asymmetry, subtlety and surprising departures from predictability.[37] The tradition recognizes the value of some study of anatomy, but holds that too much knowledge of what lies beneath the skin overly influences the perception of what is actually seen.

After years immersed in the practice, I started feeling an affinity for "recent" advances in science and mathematics that are about avoiding simplification in order to arrive at more accurate representations of nature: chaos theory, fuzzy logic and fractal geometry.

Conclusion

In its insistence on the primacy of visual perception; its placement of experience over theory; its fidelity to nature; its injunction against imposing preconceptions on the act of observation; in its necessary method of finding wholeness in parts of the visual world; in its reluctance to consider parts isolated from the whole, in its avoidance of pulling abstractions from

experience; in the emphasis placed on long rigorous training of the eye in the presence of nature; in the resulting experience of seeing underlying patterns and principles in nature; the atelier tradition of the study of nature is practically identical to Goethean science. The atelier tradition seems to meet all of Goethe's criteria about what makes valid science. Differences do emerge when intentions and specific practices are examined.

Bozeman Sunset, plein air, oil on canvas Daan Hoekstra, 2003

Since full-time atelier students typically spend 30 hours per week in the observation of nature, for four years, there is perhaps no other more intensive living tradition of phenomenological practice in the world, with the possible exception of some forms of monastic practice. The tradition might contain information useful to current practitioners of Goethean science.

Nigel Hoffman points towards a unity of science and art, and properly points out that they spring from the same source.[38] Perhaps Goethe's scientific method was absorbed into the atelier tradition or maybe Goethe derived his scientific method from his significant knowledge of the processes of art.

My intuition tells me that Goethe consciously applied the artistic method current in his era to scientific investigation. It is hard to prove, but delightful to imagine: Goethe had a keen understanding of antiquity and the essential unity of knowledge—a point where art, science and philosophy

converge. He clearly recoiled in horror against the idea of a science that excluded the human observer, understanding the appalling consequences. With genius, brashness, and a sense of humor, he claimed scientific validity for the artistic method. It is a story of heroism perhaps unparalleled in history. The evidence suggests that the story may be true:

One element of atelier practice that helps students to see the vibrant qualities of color, is the idea that one must look for the most intense colors in nature next to the boundary between light and shadow. Shadows themselves, and fully lit areas of objects, generally contain colors less intense than the colors found in half-tone, right on the shadow edge. This observation became part of artistic practice at least as early as the 17th century. It is very evident in the work of Vermeer and Rembrandt. A beautiful recent example can be found in Steven Assael's *Nichole and James*, diptych, 2005.[39]

In a superb essay, David Seamon describes some prism exercises that were done by Goethe as part of his study of light. One of the main observations that can be drawn from the exercises is that prismatic colors arise where light meets darkness.[40] Goethe found repeatable evidence that concurs with the observations and practices of Vermeer and Rembrandt.

Seamon describes Goethe's understanding of the *Ur-phenomenon* of color[41] as the resolution of tension between darkness and light; "Thus darkness lightened by light leads to the colors of blue, indigo and violet, while light dimmed by darkness creates the colors of yellow, orange and red."[42]

Seamon's description is a good explanation of the painter's practice of glazing. A dark base color overlaid with a lighter transparent color yields a cooling effect (towards blue, indigo, and violet). In this way, Rembrandt painted brilliant blue skies without blue pigment. Instead, he used a base of black mixed with white, which he overlaid with a transparent white in order to cool it towards blue. When juxtaposed with very warm colors, the viewer perceives Rembrandt's concoction of black and white as brilliant blue.[43]

A light base color overlaid with a darker transparent color yields a warming effect (towards yellow, orange and red).

Since painters used glazing techniques widely and expertly hundreds of years prior to Goethe, it is very likely that Goethe's experience in the practice of art and his association with painters sparked his skepticism about Newton's theory and suggested an alternative.

In explaining Goethe's interpretation of the optical effects of atmosphere Seamon states: "The mountain ranges farther from me have more

atmosphere in between than the ridges nearer, so distant ridges appear blue, while those nearer are indigo and violet."[44] This observation, and its application to landscape painting, was common throughout the Renaissance. More interestingly, an artist can evoke the phenomenon of the more distant mountain, in the very same manner in which the *Ur-phenomenon* originates. Goethe attributed atmospheric effects to a translucent medium.[45] Painters can use a translucent medium to cool a violet mountain towards blue.

Atelier methodology may be understood as a series of steps:

1) Observe the phenomena of nature.

2) Recognize errors through knowledge of *Ur-phenomena* inherited via a tradition born in centuries of observation.

3) Test inherited knowledge against the phenomena.

4) Make the necessary corrections, while finding the proper relationship between the parts and the whole.

5) Bring about similar phenomena*, in the same way*[46] (as much as possible) that the natural phenomena came about.

6) Gradually learn to recognize *Ur-phenomena*.

Several loosely related bits of striking evidence support the idea that Goethe derived some of his methodology from pre-existing traditions of art. Michel Le Bris suggested that Goethe's Italian Journey was motivated by a desire to follow in the footsteps of Johann Joachim Winckelmann's (1717-1768) often misinterpreted "religion of beauty"— a return to the antique.[47] Goethean science was born within a broader phenomenon known as Weimar Classicism, which aimed at "becoming inimitable through imitation of classical models." The project of Weimar Classicism was about the broad application, in culture and society, of ancient aesthetic principles in order to recover a sense of the wholeness of human existence within an organic unity in an 18th century Europe plagued by dualism.[48] In other words, it was about the application of the philosophy of art to realms outside of art. The application of a methodology of beauty to the larger world might be considered the noblest of human aspirations.

Throughout the years leading up to the publication of *Zur Farbenlehre*, Goethe corresponded with the Phillip Otto Runge, an artist working on his own color theory.[49] The works of Jacob Boehme heavily influenced Runge's theory, especially *Mysterium Magnum*, which points towards a "'third world' that unites the world of physical perception and the world of essences."[50] Goethe's work was built upon centuries of antecedents and is intimately intertwined with the history of art.

The most solid evidence I have found that suggests that Goethe's scientific method was derived from older traditions in art is in Erwin Panofsky's assertion that Goethe's notion, so very central to his methodology of science—that Idea is the result of experience, beginning in the observation of nature—was present in the art theory of Giovanni Pietro Bellori as early as 1672.[51]

The origin of Goethean science, though, is of less importance than the fact that both Goethe's way and the atelier tradition rely heavily on the same very ancient ideas. In that sense, both practices can be seen as ways in which people in today's world can access a premodern experience—the experience of being embedded in an organic unity—and benefit from the rich insights that come from the experience. Both are missing the extraordinary opportunity to learn from each other, and this essay only scratches the surface of what might be a very fruitful study of concordances.

The atelier tradition, for example, can learn from the strong emphasis that Goethean science places on memory and visualization. David Seamon, for example, described what Goethe called "exact sensorial imagination"—visualizing a phenomenon in the mind.[52] Goethean method also calls for visualizing phenomena coming into being, both forwards and backwards. It would be extremely beneficial to put this technique into practice in the atelier.

The importance of visual memory in the training of painters cannot be exaggerated. Every drawing done from life involves memory, because time passes between viewing the model and recording the facts on paper. In painting, memory plays an even more important role. One needs to see a color/value note in relationship to other notes in the model, mix it on the palette, and place it properly on the canvas.

Many painters throughout the 19th century spoke of the importance of visual memory, and the need to train it. Degas, for example, said, "If I were to open an academy I would have a five-story building. The model would pose on the ground floor with the first-year students. The most advanced students would work on the fifth floor."[53]

Current atelier practice turns to Horace Lecoq de Boisbaudran, a teacher of Rodin and Fantin Latour, for his method of training visual memory. I do not believe that any atelier instructor today would say that current techniques of memory training are sufficient. In relation to memory training, we are trying to reconstruct a lost practice just as Lecoq de Boisbaudran was trying to rebuild an 18th century atelier tradition.[54] Goethean science may have preserved or invented techniques that could help us.

I also believe that current practitioners of Goethean science could find valuable practices in the atelier tradition. If I am right in my assertion that the artist's study of nature as practiced in ateliers conforms to Goethe's ideas about what makes valid science, the Goethean tradition has a new mine of experience and information, and it may extend backwards in time, as well as forwards, i.e. "Goethean" science may have been practiced prior to Goethe. The possibility is too important to leave unexplored.

Since the artist's study of nature did predict some of Goethe's findings, in finding color on the border between light and shadow, for example, it is not unrealistic to expect the evolving tradition to keep generating useful ideas. The artist's tradition is a phenomenological study of light, shadow and color, as well as a study of patterns, structures and meanings in the visual world—built upon hundreds of years of intersubjective corroboration—so it ought to be useful to physicists interested in a phenomenological approach to nature.

The stakes are high. If conventional science tells us that a sunset is about particles and wavelengths, as if human experience of color does not exist, it may lead to still more technologies that further devalue and erode human sensual experience. As a teacher and an artist, I understand that people are losing their ability to see. We are losing our very humanity, our most basic instrument of knowledge. Why? We are too busy to slow down and look. Television, movies, billboards and magazine ads seduce our eyes with shallow, flat, second or third-hand versions of the visual world.[55] Science that describes the world as if people do not exist may be a sort of self-fulfilling prophesy—the ultimate Faustian bargain that compromises humanity's soul and future.

The roots of phenomenology are as old as time. "Primitive" peoples did not make the modern distinction between appearance and reality. "We see the sun rise and set, but we think of the Earth as moving round the sun. We see colours, but we describe them as wavelengths." This modern separation of appearance and reality was unknown in primitive cultures.[56] The solutions to our modern problems might be found in premodern modes of thought and experience. Perhaps only by looking backward can we find our way forward into a bearable and sustainable future. Goethe believed this strongly, saying "He who cannot draw on three thousand years is living hand to mouth." Perhaps what we call "culture" is the cultivated memory of "primitive" wholeness, and a way to practice it. I see Goethean science and the atelier tradition as part of a much older tradition that has been with us since the dawn of civilization.

If our 21st century world, to a great degree, is a consequence of a Newtonian/Cartesian science, what would it be like if our world had instead been a consequence of a science with precepts identical to a methodology of art that produced masterworks of great beauty?

We make the world in which we live. If Goethe's way had prevailed, our world could have been made by scientists and artists trained in making things *in the same way in which nature makes things.*

Art is about making things intentionally. We surrendered the making of our world to another field that specializes in poking things, prodding them, cutting, smashing and manipulating things, not making things. Things do result as by-products, often far-removed from intentions. The seeds of violence and alienation are contained in the method. Only a science of wholeness can put the pieces back together.

If we look at one of Goethe's definitions of the arts, we might catch a glimpse into the intentions that drove his scientific studies: "The arts are the salt of the earth; as salt relates to food, the arts relate to technology."

If we meditate upon Goethe's words, art and science might be wed in a partnership, each partner finally performing its proper role: science investigates, art makes.

I continue as an artist and a teacher in the slow, patient, premodern practice of naturalism because I am uncomfortable with the idea of a world without human eyes to appreciate a sunset. I hope that the process of continually training my eye, and training the eyes of others, will awaken organs that will help to heal the sad tragic rift between nature and culture, subject and object, spirit and matter.

Notes

[1] Joscelyn Godwin, a professor of music at Colgate University, quoted this traditionalist view in his report on the First International Conference on Religious Art, Tehran, 1995, in *Kosmos* 1, 1996, Phanes Press.

[2] Albert Bielchowsky, *The Life of Goethe* (New York: Putman, 1905), p 413.

[3] Ibid, p 368-413.

[4] Ibid, p 345, and Madeleine Pinault, trans. Philip Sturgess, *The Painter as Naturalist* (Paris: Flammerion, 1991) p 246-259.

[5] Arthur Zajonc, "The Two Lights," *The Lindisfarne Letter 14*, *Homage to Pythagoras* (West Stockbridge: 1982), p 74.

[6] See David Seamon and Arthur Zajonc, eds. *Goethe's Way of Science* (New York: SUNY Press, 1998).

[7] Mark Riegner and John Wilkes quote Goethe in "Flowforms and the Language

of Water," in eds. David Seamon and Arthur Zajonc *Goethe's Way*, p 233. "He to whom nature begins to reveal her open secrets will feel an irresistible yearning for her most worthy interpreter: Art."

[8] Kathryn Manzo explains the shift in "A Call for a Return to Standards in Art Education," *Classical Realism Journal*, Volume IV, issue 1, 1997, p 12-17. See also Charles Harrison and Paul Wood, *Art in Theory* (Oxford and Cambridge: Blackwell, 1992). Most modern theories of art expressed a rejection of traditional knowledge.

[9] Nicholas Beer explains the history of the method in "Sight-Size, an Historical Overview," unpublished mss. Copyright 2002, on the website of Charles Cecil Studios.

[10] An atelier is the private studio of a practicing painter, who dedicates part of his time to teaching a limited number of students. The atelier tradition evolved from the apprenticeship system of the renaissance, and became very successful, especially in the 19th century, when artists from around the world went to study in ateliers, primarily in France and Germany. John Singer Sargent, for example, studied in the atelier of Carolus-Duran. Although the larger academies evolved from the ateliers, only a few dedicated artists in the 20th century carried on the tradition of teaching in a more personal and intimate studio setting. Definition derived from the work of Charles Cecil and Adrian Gottlieb.

[11] Frederick Amrine, in "The Metamorphosis of the Scientist," D. Seamon and A. Zajonc eds., *Goethe's Way*, p 40., states that Goethe considered the scientific experiment as a "mode of representation."

[12] Atelier trained painters of the 19th century include Monet, Whistler, Sargent and Gerome, among many others. Present day artists who exemplify the tradition include my Atelier Lack colleagues Charles Cecil, Daniel Graves, and their student Adrian Gottlieb, all whose work is readily visible on the worldwide web. *Classical Realism Quarterly* and *Classical Realism Journal* documented 20th and 21st century ateliers, and also published articles about 19th century atelier practices. See also Loraine Crouch, "Finding Your Roots," *The Artist's Magazine*, April 2001, p 70-1.

[13] Usage of the term nature in the artist's tradition contains no man/nature dualism. It refers strictly to the world of visual phenomena: humans, the works of humans and nonhuman nature. It might be similar to Schelling's term *natura naturans*, explained by Catherine Larrere, *Environmental Ethics19*, number 4, 1997, p 434.

[14] That Goethe emphasized training the senses, especially vision, is explained in D. Seamon, "Goethe, Nature and Phenomenology," *Goethe's Way*, p 3.

[15] I studied with Richard Lack, who studied with R.H. Ives Gammell, who studied with William Paxton, who studied with Jean-Leon Gerome, who studied with Gabriel-Charles Gleyre, who studied with Paul Delaroche, who studied with Jacques-Louis David. See Loraine Crouch, op cit.

[16] Amrine, p 37. "One's initial 'theorizing' (Goethe always understands this term in its etymological sense, as our 'way of seeing') is not tested against logical axioms deduced from an abstract hypothesis; rather, it is continually tested against the phenomena themselves." The atelier tradition and Goethean science concur in this respect.

[17] Seamon stresses the importance of maintaining "experiential contact with the thing throughout the course of investigation." *Goethe's Way*, p 4.

[18] "Wearing blinders" from Amrine, p. 40. Mark Riegner expresses a similar opinion: "Just as it is fruitless to search for meaning in the isolated letters of a word, so do isolated phenomena yield only a fragment of their full significance," from "Doing Goethean Sci-

ence," in *Goethe's Way*, p 208.

[19] The pre-Socratic philosopher Anaxagoras said, "The things of the universe are not sliced off from one another with a hatchet." From *Hermetica* ed., trans. Walter Scott (Boston: Shambala, 1993), Libellus XVI, p 265: "If anyone attempts to separate all things from the One, taking the term 'all things' to signify a mere plurality of things, and not a whole made up of things, he will sever the All from the One, and will thereby bring naught to the All." A timely caution for modern science.

[20] Daniel McNeill and Paul Frieberger, *Fuzzy Logic* (New York: Touchstone, 1993), p 129-30 states that the parable of the blind men and the elephant dates back to 2500 BC. The Sufis also claim the parable as their own. See Idries Shah, *The Sufis* (Garden City: Doubleday, 1971), p 40-1.

[21] Seamon, p 4. "To intellectualize abstractly as little as possible."

[22] The concept of reconciliation of opposites was present in Pythagorean thought, and throughout the history of Western philosophy of art since. See *Homage to Pythagoras, Lindisfarne Letter 14* (West Stockbridge, 1982), and Shah, *The Sufis*.

[23] See Mark Riegner, "Horns, Hooves, Spots and stripes: Form and Pattern in Mammals," *Goethe's Way*, p 179.

[24] Goethe repeatedly said that his scientific work had to be done to be understood. Amrine p 42. See also Shah, who says the same about Sufi "work."

[25] I borrow the wording from David Fideler, of Phanes Press.

[26] Albert Boime, *The Academy and French Painting in the Nineteenth Century*, (New Haven and London: Yale University, 1986) p 122-7.

[27] Ibid.

[28] For a good discussion of the deeper intentions and meanings of *mimesis*, see Erwin Panofsky, *Idea: a Concept in Art Theory*, (New York: Harper and Row, 1968). See note 43.

[29] See Amrine, p 42, "displacement of product by process...."

[30] See Riegner and Wilkes, p 234.

[31] See Manzo, op cit.

[32] See Henri Bortoft, "Counterfeit and Authentic Wholes," in *Goethe's Way*, p 293. Bortoft says that modern education is so abstract that science students get bored when asked to observe the phenomena of nature. I have noticed the same behavior in beginning art students.

[33] Seamon, p 2. "Accurate description is not a phenomenological end, but a means by which the phenomenologist locates the phenomenon's deeper more generalizeable patterns, structures and meanings."

[34] Harold Speed contends that children do not even consult vision in their first attempts to draw, in *The Practice and Science of Drawing* (New York: Dover, 1972), p 44.

[35] See Nader Ardalan and Laleh Bakhtiar, *The Sense of Unity: the Sufi Tradition in Persian Architecture*, (Chicago and London: University of Chicago Press, 1973), and the work of Keith Critchlow.

[36] Linear perspective is associated with a Newtonian/Cartesian worldview. See Robert Romanyshyn, *Technology as Symptom & Dream*. (London, New York: Routledge, Chapman & Hall: 1989).

[37] "Clouds are not spheres, mountains are not cones, coastlines are not circles, and bark is not smooth, nor does lightning travel in a straight line,"---Benoit Mandelbrot, quoted in James Gleick and Elliot Porter, *Nature's Chaos* (Boston: Little, Brown, 2001).

[38] Nigel Hoffman, "The Unity of Science and Art," *Goethe's Way*, p 168-9.

[39] *American Arts Quarterly*, 23: 1, p. 53

[40] David Seamon, in "Interconnections, Relationships, and Environmental Wholes: a Phenomenological Ecology of Natural and Built Worlds*" Renew the Face of the Earth: Phenomenology and Ecology*, (Duquesne University Press, 2006).

[41] David Seamon defines "*Ur-phenomenon*" as "the deep down or primal phenomenon that marks out a necessary pattern of relationship." "Interconnections..." *Renew*.

[42] Seamon, "Interconnections..." *Renew*.

[43] I learned about Rembrandt's ability to paint blue without using blue pigment in a conversation with Peter Bougie, who was working on a Rembrandt copy while we were students at Atelier Lack. Peter said he was using the same method in his copy and I have no doubt it is true. Bougie went on to become editor of *Classical Realism Journal*, a member of the American Society of Classical Realism, and founder/director of Atelier Bougie.

[44] Seamon, "Interconnections…" *Renew*.

[45] Ibid.

[46] Erwin Panofsky, op cit, recognized this when he quoted Plotinus: "When someone looks down upon the arts because they are concerned with imitating nature, it must first be replied that also the things of nature, too, imitate other things; then you must know that artists do not simply reproduce the visible, but they go back to the principles in which nature itself had found its origin," p 26. Panofsky reiterates the same concept on page 42: "Art…does not imitate what nature creates, but it works in the same way as nature creates." Panofsky points out that in 1607, in *L'idea de' pittori, scultori ed architetti*, Federico Zuccari, known for his passionate attack on mathematics, and influenced by Thomas Aquinas' theory of art, referred to a concept identical to that of Plotinus: "And if we wish to know why Nature can be imitated, it is because Nature is guided toward its own goal and towards its own procedures by an intellective principle. Therefore her work is the work of unerring intelligence, as the philosophers say; for she reaches her goal by orderly and infallible means. And since art observes precisely the same method in its procedure, therefore Nature can be imitated by art." p 90.

[47] Michel Le Bris, *Romantics and Romanticism* (New York: Rizzoli, 1981), p 58-75.

[48] Simon Richter ed. *The Literature of Weimar Classicism* (Camden House, 2005), introduction.

[49] LeBris, p 70-75.

[50] Ibid, p 72. Boehme's idea of a "third world" may be similar to David Seamon's concept of triad, or Steiner's concept of "3rd element," the element that reconciles polarity, described by Riegner, *Goethe's Way*, p 179.

[51] Panofsky, p 106-8. Panosky states that Belori's theory clearly overcame the "subject object problem" and the problem of realism vs. Idealism, and Panosky also says Bellori was just reiterating a tradition of thought that originated in Renaissance classicism. Bellori argued for art that was neither too naturalistic nor too mannered in its idealization. Bellori believed that art is a kind of perfection of nature—and thus argued against excessive naturalism. The idea that art perfects nature is contrary to my purpose here, but it is very significant that Goethe's central approach to the question of realism vs. idealism was present in art theory more than a century prior to his Italian journey. If Bellori's idea of perfection of nature is at all possible (though I see it to be anti-ecological) arguably one cannot improve upon nature without intimately knowing it first through naturalistic studies. It should be noted that the atelier tradition considers the study of nature only a first step in becoming a painter. Afterwards imagination and idealization are introduced.

[52] Seamon, "Interconnections..." *Renew.*

[53] Henri Hertz, *Degas* (Paris, Felix Alcan: 1920). Translated by R.H. Ives Gammel in "The Shoptalk of Edgar Degas." *Classical Realism Journal*, IV, 2, p 41.

[54] Boime, op. cit., p. 47, 181, 195.

[55] Writing in the 1950s, Joseph Pieper says the same in *Only the Lover Sings: Art and Contemplation*, (San Francisco: Ignatius Press, 1990), p 31-3. See also Speed, op cit.

[56] Henri Frankfort, H.A. Frankfort, John Wilson and Thorkild Jacobsen, *Before Philosophy*(Baltimore,Penguin: 1972) p. 11-36, quote from page 20. See also David Abram, *The Spell of the Sensuous*: *Perception and language in a more than human world* (New York: Pantheon, 1996).