

The Science of Art: Reconsidering the Interpretive Methods of Creativity in American Art

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Philosophically in American society there has been much debate about the validity of art as a reflection of cultural importance. Historically in this country, art was thought to be antithetical to the Puritanical sensibility that defined the character of American life. Perceived as luxury, it was believed that high art caused the moral decay of great civilizations unlike the sciences which advanced the course and direction of civilization. By emphasizing methods of analysis and interpretation art historians have begun to illuminate the complex role of the visual arts as a primary vehicle through which we can illustrate how civilizations thrive.

Fundamentally, there exists in human kind an innate desire to create some visual form of personal and public record of the 'self' and the environment within which we exist. The most well known examples from ancient history are the cave drawings and small iconic objects of the Neolithic and Paleolithic cultures. These images and objects, in the absence of a written language, provide untold value to the understanding of human existence and the character of the human species. Without these kinds of creative models we would be unable to trace the social and scientific anthropology of human history. The process of translating a concept into visual language is indicative of the multifaceted expressive powers of man. The fact that these images and objects exist asserts the primacy of the instinctive creative impetus and the complexity of the mind in humanistic and scientific terms. In order to appreciate and interpret the importance of creativity we must look beyond the social and cultural constructs of a specific time and place and recognize the invaluable dimensions of the physical object. To decode and extrapolate information from these materials requires an insight based on a confluence of science and art. Harvard University scientist, Edward O. Wilson said it most eloquently; "Artistic inspiration common to everyone...rises from the wells of human nature...It follows that even the greatest works of art might be understood fundamentally with the knowledge of the biologically evolved epigenetic rules that guided them... interpretation will be the more powerful when braided together from history, biography, personal confession and science."¹ It is this philosophy that has transformed the discipline of art history and proffered a growing demand for revisionist

¹ Wilson, Edward O., *Consilience* (New York: Alfred A. Knopf, 1998), 230.

methodology specific to the purpose of identifying the complex value of the creative process as a dimension of human anatomy.

The ancient cultures of North America, for example, had no word for art rather it was a part of the human condition that had intrinsic educative and spiritual powers. In the absence of a written language the manner through which to instruct a people came through a visual code of clues depicted on functional objects. During the maturation of western culture, the distinction of naming 'Art' as a phenomenon separate from the actions of everyday life, prohibits the ability of the common man and woman to be engaged in creative activities. Art gradually evolved into a pursuit available to only those who were wealthy or educated enough to understand the salient qualities of artistic expression and in this day and age, can afford to visit the museums that house and exhibit these objects. The disadvantage of this distinction is that creativity gradually becomes dormant from its biological origins. Indeed, the very definition of the word 'art' means human creativity, without reference to cultural heritage, economic prowess or intellectual ability.

In this essay, the dialogue of this creative impulse and the scientific realm is displayed through a didactic selection of American art images because of the relative directness of expression, their iconic value to American culture and emphasis on the depiction of reality. (This method can be applied to any form of creative expression). These works provide an opportunity to evaluate the, factual, iconological and semiological aspects of interpretations of the time. Factual refers to the mathematical and structural methods of constructing a work of art. Semiology, the science of signs, assists in the decoding of information based on the nexus of social, cultural and scientific analogy. Iconology refers to the rhetoric of images. That is what images say and what to say about images.

Since the advent of the New Republic the arts in America have been defined, revered or vilified based on the moral, political, and economic values imposed upon them. In contrast, European cultures regard the arts with admiration and see it a contributing phenomenon to cultural identity and human accomplishment. Whereas literature has been embraced as a legitimate intellectual pursuit, the visual arts are received with ambivalence in fear of its potential for corruption. Consider that even today the American government spends a mere

fraction of tax revenues on the support of the arts comparative to that of other cultures around the world. Public education in the United States, under economic constraints, will eliminate classes in art and music from the curriculum because they are deemed inessential. Indeed, culturally speaking, visual art serves little or no useful purpose and therefore is perceived as unnecessary. In an effort to illuminate some of the essential aspects of creativity as a focus for the celebration of human triumph in America and as a tool for affirming the course of this civilization, scholars must reconsider their approach to the interpretive methods imposed upon the arts. The goal is to illustrate the importance of the visual arts and their relationship to other disciplines such as mathematics and the sciences as a way to define the moral, social significance of the creative process and advance the perception of creativity in visual form as a valid intellectual pursuit. The first hurdle that must be addressed is the historical context that typifies the American sensibility toward the arts.

John Quincy Adams, the esteemed American statesman would write in 1834 about the fine arts, "...from the dawn of history {they} have been prostituted to the service of superstition and despotism".² As shocking as it seems now, Adams was merely expressing the temperament and beliefs of his upbringing. As a product of his society, Adams struggled with his perception of art as luxury which was as a derisive force that resulted in the moral and social decay of great civilizations. He would argue again and again that the fine arts could never be enlisted in the case of virtue and piety. Even Abigail Adams would write that "Vanity was becoming a more powerful principal {sic} than patriotism"³. For the colonial American painted images, were sensory appeals designed to cloud intellectual perceptions and disguise the truth. Intrinsic to the make up of American society was an inherent suspicion of all things that smacked of the excesses of European culture. It was the very reason, in fact, that the first colonists arrived in New England, because of the need to separate themselves from the corruption and indulgence of England. As the American cultural historian Neil Harris observed, "...like patients absorbed in their own fevercloths, Americans met any extravagance, any novelty, even any minor surpluety with outbursts of intense anxiety"⁴. The artist was perceived as a mercenary, employed for his

² Adams, John Quincy, Select Writings of John and John Quincy Adams (Cambridge: Harvard University Press, 1982), 118.

³ Harris, Neil, The Artist In American Society. (Chicago: University of Chicago Press, 1962), 31.

⁴ Jefferson, Thomas, Papers of Thomas Jefferson XI. (Cambridge: Harvard University Press, 1950), 54

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propaganda value, by conjuring up scenes of delight that lulled away any legitimate discontent. To the common man or woman the thought of accruing these kinds of objects was considered morally corrupt and antithetical to the puritanical culture of America. To live an abstemious lifestyle was a godly lifestyle and therefore a worthy, moral life.

However, the moral, political and social debate about the value of art denies the necessity of art. Without some form of visual communication, there is no way to establish a personal lineage of family, friends and mentors, or a cultural identity. The challenge confronting the American artist was crafting an art relevant to the society that incorporates all of the quintessential elements of cultural and social distinctiveness in visual terms that did not belie the Puritan's values.

The response to this need for a visual language is the advent of the American Limner. They were self-taught craftsmen who traveled the countryside painting signs for new businesses. Their training came from house building and the use of simple principles of mathematical design and construction. When not employed in their usual labors they supplemented their income with simple visages of lawyers, ministers and prominent figures in a community. Often these were works executed posthumously. Their purpose was to establish a visual record of one's contribution to the population. The limner's innovative approach to painting was formed because of the lack of traditional artistic materials and the absence of a formal education but informed by an overwhelming desire to record the essential facts of light, shade, color, and texture, couched in the accurate depiction of materials and objects rather than the precise portrayal of the subject. They in turn develop a visual language based on recording generalized forms, without embellishments using a kind of mathematical shorthand. Their ability to reference the austerity and piety of their subjects through simple geometry, made them highly practical and marketable.

Iconographically, these works illustrate the moral and spiritual dimensions that represent the transience of life. For example, books, maps and writing materials in portraiture refer to the sitter's knowledge and education. Cut flowers or decayed fruit or food are meant to remind us of our own mortality. These artists rarely signed or dated their works as they were perceived to be merely painted objects not high art, thus opening up the opportunity to create a market for

portraiture that was succinct in its suitability to the protestant audience, unencumbered and seemingly absent of vanity. These portraits also provide insight into the enterprise and industriousness of the new nation. Thus the portrait becomes an important vehicle of historical reference and unique display of an emergent American aesthetic sensibility based in simplicity of design and the rendering of realistic details through mathematical means.

By the 1760's, the native and self-taught artist John Singleton Copley from Boston, benefited greatly from instructional books from England and France. These books were sources that combined visual language with practical applications and techniques that assisted Copley in crafting optically realistic portrayals of subjects in paint. Copley will advance the simple vocabulary of mathematical design and execution inherited from the limner into expertly rendered images based on the analytical aptitude of the artist combined with the absolute commitment to a scientific optical reality as it was understood at the time.

Copley's depictions of an evolving American Society are considered the most accomplished and remarkable images prior to the Revolution. It is because of his unequivocal commitment to the display of visual truth and realistic accuracy that he becomes an iconic presence in American art. Subjects like the iconic American figure *Paul Revere* are so unlike the works of his European counterparts who are steeped in romantic light and atmosphere characteristic of the Baroque era. Copley's painting technique illustrates a faithful interest in a scientific method of analysis and replication in structural form. As Copley would write to the American painter Benjamin West at the Royal Academy of London in November of 1766, "...your cautioning me against anything from fancy I take very kind, being sensible of the necessity of attending to Nature as the fountain head of all perfection".⁵ The desire to record reality with great acuity is dependent upon a clear, uncorrupted and informed view of nature and natural phenomena. His directness and finely tuned sense of design drew patrons to Copley because of the so called, naiveté of his style. This is exactly what distinguishes him from his counterparts in Europe and makes him uniquely American in his pursuit of artistic truth. Copley adeptly constructs an aesthetic sensibility that illustrates the complexity of the natural world without artificial applications. Rather than to mask the physical impediments of his sitters, Copley illuminates them through the stark and essential

⁵ McCoubrey, John W., *American Art 1700-1960*. (Englewood Cliffs: Prentice Hall, 1965), 98.

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aspects of light and its relevant effects on color. Copley recognized that the physical world is constantly variable and that is exactly what he makes the central focus of his work. The luminous reflections off of the surfaces of wood and skin are part of the conveyance of epistemological truth in art. The empirical world is the primary source for his understanding of the complex laws of nature. Beyond the symbolic references of the work is the intellectual focus of the artist.



Photograph © 2007 Museum of Fine Arts, Boston, used with permission
John Singleton Copley, American 1738-1815
Paul Revere, 1768
Oil on canvas
89.22 x 72.39 cm

In Copley's depiction of *Paul Revere*, for example, it is the factual communication of optical effects that are so jarring and complete, not just the emotion or the mood of the subject. The reflections of mirror-like quality reveal Copley's optical sensitivity to the subtle nuances of lighting effects and the tactile sensibility of the cloth and silver. The skin values are varied and subtle in articulation and the instantaneous moment of time is expertly rendered. The suggestion of three-dimensional objects is based on the laws of geometric construction, and further advances the 'photographic' realism of the world. The absence of brushwork seemingly eliminates the hand of the artist entirely and produces a vision so vivid that even upon close inspection the viewer is perplexed by the manner of execution.

These elements combined create a tangible world embraced by his audience in Puritan Colonial times because of the scientifically based accuracy to details. As Copley would bemoan, "the

mere dictates of nature”⁶ was his only instructor. This is of great merit in the revision of understanding and interpretation of his work because of the ability to explore that world in all of its complexity defined by a vision grounded in real appearances and solid geometrical structure rather than an artificial world as seen through academic conventions. Copley’s approach reveals a sensibility that is concrete in its adherence to the powers of the direct observation of nature and the accurate translation of that information into pure form. The illusion is conveyed through the optical effects of reality or visual truth.

Although reality is an arbitrary term, it is exactly that which Americans sought as an admonition for embracing the luxury of art. One could reconcile the depiction of a loved one in painting for posterity because the illusion, under the influence of Copley, was so faithful to the physical world. Philosophically, these images affirm the relationship between man and his environment in a tangible way that offsets the complicated moral issue of vanity.

The same can be said for the popularity of landscape subjects in American painting of the 19th century. When images of historical importance such as John Trumbull’s *Declaration of Independence* are largely ignored by the American Public, landscape works such as Thomas Cole’s 1827 work entitled *View from Round Top: The Catskill Mountains*, garner an immediate audience. As Cole would write,

“It is a subject that to every American ought to be of surpassing interest; for whether he beholds the Hudson waters mingling with the Atlantic-explores the central wilds of this vast continent, or stands on the margin of the distant Oregon, he is still in the midst of American Scenery- it is his own land; its beauty, its magnificence, its sublimity- are all his...”⁷.

⁶ “Letters and Papers of John Singleton Copley and Peter Pelham”, (Collections of the Massachusetts Historical Society, No. 71, 1914), 64.

⁷ McCoubrey, John W., *American Art 1700-1960*. (Englewood Cliffs: Prentice Hall, 1965), 98.



Photograph © 2007 Museum of Fine Arts, Boston, used with permission
Thomas Cole, American (born in England), 1801-1848
View of the Round-Top in the Catskill Mountains, 1827
Oil on panel. 47.31 x 64.45 cm

This painting exhibits a marvelous empirical quality because of the precipice upon which he situates the viewer and the exquisite treatment of transitional lighting conditions. The dramatic display incorporates new symbolic elements that will become ubiquitous to the language of American landscape art. The 'blasted tree' and the extensive panoramic view seemingly absent of human presence coupled with the distant water and mountains suggest a world uncorrupted by the evils of western culture and unadulterated by the advance of industrialization at a time when the country was engaged in the mature phase of an economic boom. But Cole is convincing in his commitment to visual truth and realism because of his ability to render the immediate qualities of light, color texture with great veracity. In his extensive travels throughout the American countryside, Cole observed specific tree formations, traversed rocky crevasses and collected geological and botanical materials that would help him accurately record indigenous species each environment. His commitment to visual truth is enhanced by the carefully crafted illusionism of vast panoramic points of view. As Kenneth J. Meyers would write in his astute essay on the construction of landscape experience in American art "As increasing numbers of

Americans learned to forget the mental labor involved in the work of landscape appreciation, the national landscape became increasingly important as a repository of cosmological, moral and social truths".⁸ The immediacy of personal experience and his ability to record these visions make his work enormously pleasing to an audience still ambivalent about art and desirous of an uncorrupted cultural aesthetic. His ultimate success is making an art work experiential because of the realistic display.

However, it is not just the mere record of the tangible world that Cole adeptly illustrates, but the indigenous flora and fauna that is unique to America. He offers a methodical visual analysis of the landscape that provides all of the significance and importance of topographical studies and geological relevance. The science of geology was very popular in the 19th century because of its accessibility. Every American had the opportunity to interact with the environment and study its properties without having to travel far. As part of the growing intellectual demeanor of the 19th century, Americans flocked to lectures and collected minerals, sand and rock that were unique to this place. Cole's vivid depictions of the environment tap into the growing appreciation of the landscape as a profound resource for learning not only about the history of this part of the world but the unique features of a world seemingly still in a primitive and pristine state.

Indeed, scientific study shaped the art of many Hudson River School painters as a way to preserve the environment increasingly under threat from westward expansion, tourism and industrialization. Of course, many would apply spiritual values to the appreciation of the landscape. Geology would provide a direct link between god and nature. As Rebecca Bedell discusses in her book 'The Anatomy of Nature', the development of a 'christianized geology'⁹ fostered a link between the morality of scientific study and its manifestation in the form of painting. The confluence of science, art and God would be seen as a vehicle through which to promote the moral values of scientific study and the freedom to embrace its visual properties in painting.

⁸ Miller, David C., American Iconology (New Haven: Yale University Press, 1993), 75.

⁹ Bedell, Rebecca, An Anatomy of Nature: Geology and American Landscape Painting 1825-1875 (Englewood Cliffs: Princeton University Press, 2002), 67.

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The purpose of public perception of art would be further complicated in American culture during the 19th century by the relationships between modes of expression, collective consciousness, economic and social forces. One must consider the changing role of the beholder, the consumption of art by varying classes and its relevant symbolic or iconographic applications. (These sociological and iconological issues are adeptly addressed by American scholars in a variety of excellent essays which I can recommend but will not include in this discussion).

In the late 19th century, American painters in this pursuit of realism and aesthetics will redefine the subject matter of still life to a new level of scientific accomplishment. The Peale family artists from Philadelphia were expert in their applications of science to the art of painting. They, like Copley, possessed a deep curiosity for the natural world and felt that these detailed renderings were an extension of scientific inquiry. This pursuit will culminate with the ‘trompe l’oeil’ painters. These artists bring the depiction of reality to its seemingly logical conclusions in their depictions of cabinets, shelves and still life objects so acutely represented that the viewer reaches out in an effort to touch the materials. In the late 19th century, William Harnett masters the emphasis on close observation. He and others deftly simulated the effects of light and reflections as seen in Copley’s portraits into illusionistic still life designed specifically to fool the eye. With meticulous accuracy and clarity, these artists reconstructed the three dimensional world as if it were extending from the canvas toward the viewer. They are also poetic narratives that explore deep meaning in the forms of ephemeral possessions. With the depiction of old books, money, photographs and envelopes, the subject of still life is transformed into the painted photograph.

By the late 1890s and certainly into the 20th century, the nexus where the dialog between reality, art, and science and social import become confluent is photography. The technology of taking and developing pictures is a vehicle through which art, physics, chemistry and mathematics converge into one complete and expressive whole. It is at this juncture in American culture where the public popularity of art develops in earnest. The relative ease with which the American public embraces the photographic media is critical to the demographic and democratic idealism of American culture. The popularity, convenience and economy of photography were and are a means through which we all can explore our innate creative sensibility. We can now

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record these actualities through out mobile phones. The propinquity of capturing a moment of time seemingly unaltered by the bias of artistic temperament was something that Americans could intellectually embrace in the 19th century. The expediency of photography also helps to transform American cultural identity. Most of us can point to a set images that define our family histories recorded in sepia-toned images of our maternal and paternal grand and great grandparents our ancestral homelands and travels. It is this immediate experiential aspect of the photograph that distinguishes between the public and the private realms of our ephemeral existence. The implied realism of these moments affirms our presence on earth just as the ancient cave paintings affirm our existence as human beings. Equally important is the duplicity in conception of the term reality. The idea of reality is one which the American public was comfortable because of the painting traditions of the past.

The photograph ontologically and thoughtfully represents a reality that is tangible and therefore seemingly truthful and uncorrupted. (Of course, we know now that this perception is not entirely true. Matthew Brady's constructed images of the Civil War are vivid examples of this).



Dorothea Lange, *Migrant Mother with Children*, 1936.
Library of Congress, Washington D.C. LC-USZ62-107705

In America, the amateur woman photographer assumed the role of inculcating moral behavior and preserving domestic and public memories. Innovative women photographers would convert photography from a leisure activity to a professional exploration by exploiting the practical aspects of the photographic medium as a vehicle to advance moral and social change in 20th century America. One need look no further than the 1937 *Migrant Mother* image by Dorothea Lange as an iconic, factual and expressive depiction of America in the throes of the Great Depression. The technical proficiency with which Lange exposes the intimate relationship

between the mother and children appears spontaneous, yet we know she choreographed the moment for the greatest compositional, psychological and physiological impact. The close up vantage point and the deftly portrayed sense of time and place crafted through the superior use of light, shade and geometry coupled with the neutral tones of black, white and gray make this a highly evocative work that connects with the emotional and intellectual perceptions of the viewer in a visceral manner. We feel great empathy for the subject. In this work as with many other photographs she crafted in her career, Lange accomplished the successful integration of art, culture, science, biology and mathematics into one unified whole.

The reason for this rather lengthy and pedantic examination of images is to reflect on the importance of varied methods of critical and analytical interpretation as a highly adaptable set of instructional devices. The confluence of creativity and interpretation based on methods derived from a thorough understanding of scientific, mathematical applications and evaluations recognize creativity as a complex intellectual pursuit that uses both mind and body as fundamental tools for communication. The biology of communication reflects back upon the necessity of human beings to illustrate some form of their existence and the desire inherent in the human condition to understand those complex ideas conveyed through visual messages. The process of instructing the viewer to see beyond just the overt visual components and explore the underlying physical, metaphorical and ontological structure of a work of art lends itself to a more complete understanding of the analytical, critical and symbolic processes that artists employ. The applications relevant to the language of art encourage one to critically assess not only the dynamics of creativity but to seek out ways to express themselves. By teaching one how to look, showing them what to look for and providing them with a vocabulary through which to express these ideas, the viewer is then empowered. Fostering an understanding of the broad range of content or meaning, one can begin to illuminate how artists are capable of eliciting responses from the audience. How the audience responds is dependent on a cohesive appreciation of the balanced coordination between scientific methods of analysis, emotional, psychological, biological, historic, and personal rudiments of human experience. Scholars in the humanities should establish a link between the domains of science and the humanities by reinvigorating the interpretation of these disciplines with the knowledge of science.

“Neither science nor the arts can be complete without combining their separate strengths. Science needs the intuition and metaphorical power of the arts, and the arts need the fresh blood of science.”¹⁰

A primary challenge we face as instructors of the humanities in American academic institutions is to encourage the student et al; the American public to embrace and cultivate the arts. In this way we celebrate the unique aspects of American culture through the imperatives of the creative process as a critical aspect of great civilizations. One important obstacle to this process is the pedagogical practice of a separation between the arts and sciences. This in effect diminishes the importance of personal creativity, the powers of the imagination and denies the expressive capacity necessary to the cultivation of the mind. This discord also establishes a competitive drive that further separates the arts and humanities economically as schools seek public and private financial support for programs.

Another reason for the ‘disconnect’ between art and science in the American educative system is that the limited introduction to the arts in youth are often abandoned for a specialization in college. How many of us are confronted with the chemistry or marketing student who is resentful of having to take a course in art or art history, music or theatre because they believe that these courses have no relevance to achieving their goals. The more adept the student is at developing a critical eye and interpretive powers through analytical examination of the humanities and the sciences through similar analytical means, the better equipped a student is to assess the value of any visual, scientific or cultural program. To engender a student with a critical language based on a dialogue between the sciences and humanities should be our ultimate goal as educators as we advance the student’s intellectual capacity and positively effect the future of the society within which we think, work, live and create.

¹⁰ Wilson, Edward O., Consilience The Unity of Knowledge (New York: Alfred A. Knopf, 1998), 230.

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