

## *Innovation and Visualization: Strategies, Trajectories and Myths*

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William M. Ivins, Jr., the Curator of Prints at the Metropolitan Museum of Art from 1916-1930 notes in his book *Prints and Visual Communication* that “[i]t is amusing to think how few of the great weavers of aesthetic theory had any familiar first-hand acquaintance with works of art and how many of them either . . . knew the art they talked about only through engravings, or else sieved their ideas out of the empty air”<sup>1</sup> (Ivins 1978: 174). Indeed earlier historians of art as well as writers on aesthetic theory often built their expertise upon a limited knowledge base personally and were aided in their studies by textual sources that were likely to rest on less exposure to the actual works than the globe-trotting general public of today. Similarly, before the nineteenth century academic education about visual art was likely to rely on textual description more than actual engagement with the objects studied, although in some cases casts or a print depicting an original work might be available to someone who could not travel. Ivins sums up the predicament well, writing:

Whenever we read a book, especially about art, archaeology, or aesthetic theory, written prior to about the beginning of the first world war, it is well to ask ourselves to what extent the writer had both a dependable memory and a first-hand acquaintance with the objects he referred to, to what extent he knew them through reproductions and what sort of reproductions he depended on. (Ivins 1978: 90)

The extent to which our thinking about art has been shaped by the predominantly textual analysis we find historically, however expert, serves to emphasize that things are not always what they seem in studies of art, aesthetics and visual communication.<sup>2</sup> In my book *Visualization and Innovation* I detail how this has fostered difficulty in seeing areas in which art, science, and technology converged historically. Today I want to offer a few general thoughts on this broad subject.

First, for example, we know that in antiquity, descriptions of works of art became a highly developed literary exercise, a talent many continue to refine today. We also know that it is said that communication possibilities increased with the advent of printing and that the standardization of book

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<sup>1</sup> This is accentuated when we consider that visual information circulated less historically than our sense of it in our visually saturated culture. Ivins estimates that the number of printed pictures produced between 1800 and 1901 was probably considerably greater than the total number of printed pictures that has been produced before 1801 (Ivins 1978).

<sup>2</sup> W.J. T. Mitchell, in his book *Iconology: Image, Text, Ideology*, offers an interesting parallel to this. His attempt to excavate the ideological foundation of the nature of images, particularly in relation to words, found that the resulting book, “which began with the intention of producing a valid *theory* of images became a book about the *fear* of images” (Mitchell 1986: 3).

production aided research and universal education.<sup>3</sup> Yet, as noted, circumstances particular to visual art limited familiarity with original achievements, a phenomenon accentuated by a descriptive literature that neutralized much of the visual power integral to the objects in real time and space.

A good instance of how easy it was to lose sight of the visual within visual art, for example, is evident if we turn to the early academic sources we identify with European art history, specifically the works of Leon Battista Alberti and Giorgio Vasari. Alberti's *On Painting*, which outlines his theory of perspective, and Vasari's *Lives* are often characterized as two of the foundational books of art history. In terms of visual art, it is ironic to think that in laying out his theory of perspective Alberti places more emphasis on his philosophical position than on visual examples of it. It is not just that the two editions of 1435 and 1436 were deliberately contrived to fit art within the humanistic tradition. More remarkably, this highly technical work on visual perspective contained no drawings in either the 1435 Latin version or the Italian translation that was produced in the following year, although editions today are likely to have diagrams inserted to aid the reader in conceptualizing Alberti's ideas.<sup>4</sup>

Vasari's equally influential *Lives* was comprised of biographies of the great Quattrocento artists. In outlining his influential theory of Renaissance art, this early art historian traced a progression through Giotto, Brunelleschi and finally the titanic figures of Michelangelo, Leonardo da Vinci and Raphael. The first edition, published in 1550 was followed by a second in 1568 that included a partial rewrite and the addition of woodcut portraits of artists (some conjectural). Let me stress that the 1550 edition of Vasari's *Lives*, so instrumental in establishing the framework for the art history canon, contained no illustrations. He added woodcuts and biographies with the second printing, which explains why, in this rare instance, the second edition is commonly preferred. Even still, these prints were not of the works of art discussed.

In terms of art, science and technology, it is intriguing to think of the writings of Vasari and Alberti in light of the invention of the printing press technology, which we date to the mid sixteenth century and acknowledge was so crucial in disseminating the scientific theories that formed the basis for the scientific revolution. As the date of Alberti's publication suggests, it circulated as a handwritten

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<sup>3</sup> The earliest dated printed book known is the "Diamond Sutra," printed in China in 868 CE, although it is suspected that book printing may have occurred long before this date. We also know that in 1041, movable clay type was first invented in China. It is generally said that the advent of printing in the West needed to wait for the development of a proper paper. The first known woodcuts printed on paper were playing cards, produced in Germany early in the fifteenth century. Johannes Gutenberg invented the printing press with replaceable wooden or metal letters in 1436 (completed by 1440). This press, with its wooden and later metal movable type, printing brought down the price of printed materials and has remained the standard until the 20th century.

<sup>4</sup> It is unclear why Alberti, who provided illustrations for *Mathematical Games*, for his work *On Sculpture* and for a short treatise on perspective, parallel to *On Painting*, did not equip *On Painting* with the diagrams that would have made this densely technical book far more accessible" (Grafton, 2002: p. 100).

manuscript initially. Produced just before the introduction of the printing press, it benefited from this technology. First printed in 1540, *On Painting* was among the earliest books to take advantage of the ability of this device to produce multiple copies mechanically. Vasari, who was a bit older than Alberti, used the then new printing press for his first edition published in 1550, which was soon followed by the updated 1568 edition. My point is that a significant and often ignored component of these early and influential works is the extent to which they lacked imagery we associate with hand-written manuscripts as well as the abundant illustrations we might find in a ground-breaking art book today. Nonetheless, these publications underscore two cultural changes that influenced how discourse about art developed. First, printed texts, as is well known, hardly capture the richness of original works and largely were unable to include facsimiles. Perhaps more important in terms of views that have defined the field is that the need to rely on descriptive language allowed the authors to highlight the humanistic aspirations of the men who penned the foundational studies of art history. Their descriptions of the visuals, rather than visuals themselves, defined their presentations.

In 1924, when the Dutch historian Johan Huizinga (1872-1945) wrote his book *The Waning of the Middle Ages*, a classic study of art, life and thought in France and the Netherlands during the 14<sup>th</sup> and 15<sup>th</sup> centuries, he claimed that one impetus behind it was to correct the record. Writing roughly seventy-five years after the invention of another technology, photography; Huizinga pointed out that our perceptions of historical times, early in the twentieth century, had come about because the people were more visual having seen monuments of other cultures and reproductions depicting life in other times. Learning from these artifacts, rather than textual accounts of distant places and eras, as Huizinga explained, our understanding of peoples and events was transformed (Huizinga 1999).

Moving forward in time allows us to identify recent technologies that would astound Huizinga and his recognition of visual reality. Our world goes far beyond the proliferation of images that began with the camera. The World-Wide-Web and the various devices within our environment have transformed our experience completely. Images surround us constantly, to say the least. Even within the limited domain of historical art we see how dramatically things have changed.

Within an art conservation laboratory of the early twenty-first century, for example, trained practitioners preserve artifacts that might range from paintings and woodcuts to photographs and projects constructed using pixels or video. Moreover, efforts to maintain art objects, our human heritage, rely on both historical and contemporary science and technologies. Apparatus ranging from microscopes and infrared cameras allow us to look beneath the surface appearance of objects studied. Mortars, pestles and ground pigments, on the other hand, highlight the need to understand how a knowledge of early chemistry was a part of the artist's toolbox before the introduction of tubed paint. The tantalizing ways in which

earlier art included scientific experimentation as well as the technologies of earlier eras is indeed of area worthy of further research.

Equally thought provoking are the scientific experiments exposing pigments on an artist's work that actually post-date that artist's life and the technological tools that allow us to see underdrawings that may differ from the painted image we see on the surface. Discrepancies of this kind raise questions about authenticity and urge us to ask whether cultural fashions and tastes led to object alterations or point to outright forgery. On the other hand, contemporary communication options like the World Wide Web take us outside the laboratory and into distant collections, allowing us to further acquaint ourselves with works found throughout the world. Although a "click of a mouse" visual does not reveal the aura of the actual work, a pictorial representation is more likely to acquaint us with the impact of a work as a whole than a linear sequence of descriptive words. Comparing the text with the image also gives us insight into proposed theories, often pointing out that the (sometimes contradictory) definitions of art have fluctuated over time.

This brief tour hardly conveys the complex tapestry of art history, the history of science and technology and how frequently artistic invention intersects with science and technology. Nor do these examples suggest the difficulty in isolating particular trends related to these domains. There are so many threads touching each possible topic that constructing a design for this forum required broad generalization and brevity.

In closing, suffice to say, the confluence of art, science, and technology long opaque within the humanistic bias we can trace back to Alberti and Vasari are now beginning to attract our attention again. So, too, is the complex history in which science, philosophy and humanism grew hand-in-hand. As E.H. Gombrich, the late doyen of art history concisely stated in his book, *The Preference for the Primitive*:

The well-known dictum by the philosopher Alfred N. Whitehead, that the whole history of Western philosophy is but a series of footnotes to the writings of Plato, applies with special force to the philosophy of the arts . . . (Gombrich 2001: 11).

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