Introduction

A large drawing links an angelic figure draped in brilliant blue *all'antica* and Saint Bruno (frontispiece).[1] The sheet of paper that dominates the painting—which re-presents the picture plane as an alternative representational space—is not Étienne Dupérac's print of the Roman Baths of Diocletian—on which site Saint Bruno's order would build a convent—but a drawn copy of it.[2] The painter, Eustache Le Sueur, has carefully conveyed in oils the flat tints of the ink washes that are typical of drawings. This represented drawing borrows the black-and-white bichromy of its engraved model but sets it against a colored sky of blue and yellow; the values of black—considered a noncolor by the painter's contemporaries—contrast with the colors of the two figures; and its gray architecture is distinct from Castel Sant'Angelo's, painted in ocher, red, and blue. The absence of color performs a discriminative and deictic function, playing on the contrast between polychromy and bichromy in order to indicate the drawing's strictly architectural nature, within a tradition that limited architecture to black and white. How then do we explain that a century later the painter Louis Tessier boldly depicted a drawing of fortifications in brightly colored washes, resting on a box of watercolors (fig. 1)? Why show a variety of colors when they are not essential to architectural drawings? This study investigates the reasons for and ways in which color was used, exceptionally, in the representation of architecture. An examination of these two paintings suggests paths toward an understanding of the roles assigned to pigments. The reds of Castel Sant'Angelo's roof tiles and of the roses in Tessier's painting recreate the colors of objects that we perceive visually: they were meant

1. Louis Tessier, *Arts and Sciences*. Oil on canvas, 84 × 116.5 cm. Galerie Michel Descours, Paris.

to imitate nature. The gray washes of the baths' vaults, the pink color in the plan, and the colored outlines of the continents on the globe bear no relation to visible reality: they act as signs, which are legible thanks to a convention understood by artist and spectator. Finally, the pink and blue of the drawing of the fortifications echo the colors of the flowers and of the book leaning against the wall: the painter employed these colors to balance his composition; to produce harmony and beauty in order to create an affective relationship between the spectator and his painting. Imitation, convention, affect: these three ways of using color constitute the reasons for and modalities of the introduction of color into the monochrome world of architectural representation.

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Although references to monochromy and the absence of color correspond to no scientific reality, the reader understands them, just as the early modern spectator clearly distinguished between a drawing in gray or brown grisaille and a sheet

washed in blue, green, red, or yellow. Black, which today we consider a color, was not thought of as such from the period marking the beginning of this study until the late eighteenth century, with the emergence of Romanticism.[3] Draftsmen and printmakers were perfectly aware that they were choosing between two means of expression: with or without colors. To some degree, this set them apart from builders, for whom the boundary between monochrome and polychrome architecture was more elusive, given, among other reasons, the variable nature of their materials and the way these were affected by the changing play of light. I will not be discussing built architecture from this point of view, since I detect no systematic imitative connections between polychromy in drawings and in buildings.[4] My focus is on the practices of architectural draftsmen, colorists, and engravers and on the subjects they produced on paper. The definition of the architect was constantly shifting in the early modern period. Beginning in the Renaissance, architects defined themselves no longer by their knowledge of construction, but by their ability to design and to translate that ability into drawings. Titian demonstrated this in his portrait of the architect Giulio Romano: here, the traditional attributes—compass and square—are replaced by a sheet displaying a sketch in brown ink and brown wash of a building with a central plan (fig. 2).[5] For Leon Battista Alberti, writing in the mid-fifteenth century, architects did not produce buildings, but drawings of buildings, notations and writing.[6] In accepting drawing as their own system of representation, architects determined that the shape of objects, not the process of construction, would be architecture's essential quality. The fact that the earliest

2. Titian, *Portrait of Giulio Romano*, ca. 1536. Oil on canvas, 101 × 86 cm. Museo Civico di Palazzo Te, Mantua.

surviving treatise on architecture in the West, Vitruvius's *De architectura*, from the first century CE, came down to us without its original illustrations made possible many adaptations and modernizations.[7] Nevertheless, as Roland Recht and James Ackerman have argued, there is an essential disjunction between the architectural object and its graphic representation: the latter results from the application of stylistic conventions, specific to a period and a milieu, that dictate the manner and style of the representation.[8] This is one reason why architectural historians would do well to pay particular attention to architectural drawings as objects in themselves, and not as mere interpretations of the buildings to which they refer. As Nelson Goodman reminds us, architecture is at once an allographic art—that is, the artist's work is executed by others (like music)—and an autographic art, in that the architectural drawing, like a painter's, is a work in itself.[9] The question of whether the history of architectural drawing should be considered independently of the history of architecture continues to be debated. For Jorge Sainz, it is difficult to tell an Italian Renaissance drawing from an Italian baroque drawing solely on the basis of graphic technique, whereas there is no mistaking the architectural style depicted.[10] Luis Moya, on the other hand, maintains that there exists a relationship between every architectural style and the drawing that represents it.[11] Yet it seems more interesting to imagine that architectural drawing evolved not only in tandem with the development of architectural styles, but also autonomously, with its own history and in continual dialogue with other, related arts and disciplines.

The drawings and engravings discussed in this book are primarily concerned with the figuration of an architectural object that was built, was intended to be built, or could have been built. Following the architect and theorist Jean-Paul Jungmann, I retain a distinction between representational images intended as documentation—vehicles of information—produced, among others, by architects, and "pictorial images," made expressly to be read and perceived in an aesthetic mode, such as landscape drawings that might include buildings, fantasias and *capricci* (even when drawn by architects) or paintings of *vedute*, vistas, landscapes, fêtes, and architecture executed by artists.[12] The present volume argues that color is one of the most important outcomes of the dialogue between these two categories of image. I hold that color is the perfect expression of a crucial moment when architects blurred the inherited boundaries between their discipline and others, whether scientific, in the case of engineers, or artistic, in that of painters. I interpret the emergence of color as resulting from the anxiety of architects when faced with the absence of a clearly assigned place for their discipline within the system of arts and sciences as constructed in the early modern era. If we look for examples among the painted portraits of architects—one of the ways in which they presented themselves to the world and to posterity—we note a general absence of depictions of polychrome drawings. The rare exceptions evidence a blurring of disciplines. Let us take two examples dating to the first third of the eighteenth century. The first is a portrait of Giovanni Niccolò Servandoni, the Italian architect famous for the design of the façade of the Paris church of Saint-Sulpice,

3. Giovanni Niccolò Servandoni (attrib.), *Self Portrait*, ca. 1730. Oil on canvas, 130 × 97 cm. Musée National des Châteaux de Versailles et de Trianon.

of which he proudly holds a colored drawing (fig. 3). Beside the architect's traditional attributes—plumb line, ruler, divider, and square—he placed those of a painter—palette and brushes—to indicate his double expertise as architect and painter. The other example is a portrait of the German architect Balthasar Neumann (fig. 4). The painter, Markus Friedrich Kleinert, portrays him pointing to one of his greatest achievements, the bishop's residence in Würzburg; however, Neumann is dressed in armor, leans on a cannon, and displays a sheet with a colored plan of fortifications. The two paintings illustrate our central argument, which is that color appeared when architects approached the worlds of painters or military engineers and broke with the traditional monochromy of architecture on paper, which had stood for drawing versus color in the ongoing debate surrounding these in the arts in the early modern period.[13]

In the fourth century BCE, Aristotle countered the earlier Platonic bias against the imitation of nature, mimesis, by arguing for its pleasures, while in his *Poetics* he laid the foundation for a theoretical distinction between drawing and color.[14] He privileged form over matter, such that a pictorial work might be regarded as a source of knowledge as well as of pleasure, and compared the elements of tragedy with those of painting, as in the following passage: "A painter who smeared on the most beautiful colors at random would give less pleasure than he would by making a likeness of something in black and white."[15] In Jacqueline Lichtenstein's felicitous

4. Markus Friedrich Kleinert, *Portrait of Balthasar Neumann*, 1727. Oil on canvas, 95 × 76 cm. Mainfränkisches Museum, Würzburg.

phrase, "Plato condemned painting because of its colors and Aristotle reprieves it for its drawing."[16] At the turn of the eighteenth century, the key moment in the present narrative, the French theorist Roger de Piles redefined mimesis in a way that uncoupled it from any reference to reality, focusing rather on its capacity to create illusion, to render a "naturalness" arising from an analysis in terms of effects, rather than truthfulness.[17] This radical transformation was the backdrop for the transition from the imitative color of the seventeenth century to color in the service of affect in the eighteenth. And yet, this shift raises a fundamental question when considered in the context of architectural drawing, the primary purposes of which are not those of painting, and which are intended to transmit measurable data. This tension lies at the heart of the debates of the second half of the eighteenth century. However, between the period when architects adopted imitative color and the moment when affective colors would predominate in their drawings, they had borrowed from engineers a use of color that had been largely absent from painterly practice: that is, the conventional. As Lichtenstein notes, painterly color does not lend itself to a semiotic reading. It is neither a sign nor a system of signs, but a composite effect encompassing the combination of tints and chiaroscuro.[18] In that respect, architectural drawings are unlike those of painters; they do integrate color as a sign, as a convention, and not simply as a means of imitation or affect.

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The representation of architecture shuttles between two poles, the imitation of visible nature and the use of conventions that can convey the information necessary for the object to be understood in mathematical terms. We should recall, however, that even in painting the doctrine of imitation—mimesis, as formulated by Aristotle, which shaped all Western thought on the nature of artistic activity—is open to question. When the art historian Ernst Gombrich addressed the long mimetic tradition, he proposed a symbolic theory of pictures, according to which the artist does not hold up a mirror to nature, but tries out pictorial arrangements intended to make illusions of reality more effective.[19] These arrangements were tested against nature in order to evaluate their effectiveness. On the other hand, for Goodman, a leading proponent of conventionalism, realism in art is neither a matter of imitation nor an attempt at illusion, but a matter of habituation to standardized systems of representation.[20] For there to be a convention, a sufficient number of individuals belonging to one social or professional group must agree explicitly or implicitly that a connection between an object or a practice and a value or a meaning be established. Applying this definition to art, a convention is, in the words of Raymond Williams, "an established relationship, or ground of a relationship, through which a specific shared practice—the making of actual works—can be realized."[21] In Europe before the nineteenth century, architects, unlike painters, did not constitute a clearly defined social or professional group. This set them apart from another group of individuals, who actually "made" architecture:

military engineers, who were recognized by titles and functions that structured new conventions. As Eugene Ferguson and Hélène Vérin have observed, the type of imagination required of engineers was not as far from the domain of the visual arts as our contemporary societies might perceive it to be.[22] A close relationship to the image is the key to understanding what unites engineers, architects, and painters in our history of color and of the transfer of practices between disciplines that appear at first glance radically distinct in terms of their means of projection. As Antoine Picon has convincingly argued, one cannot separate, in the early modern period, engineers, who think in algebraic terms; architects, who employ geometry; and painters, who use figurative drawing.[23] In eighteenth-century France, the proximity between engineers and architects increased, allowing the formulation of specific conventional signs in the figuration of architecture. As the military engineer Louis-Charles Dupain de Montesson wrote in 1775, "One could say that a plan is a compound of signs that speak to the eyes and explain themselves without speech" (fig. 5).[24] In *Les Mots et les choses*, Michel Foucault analyzed the emergence, in the mid-seventeenth-century works of philosophers close to the abbey of Port-Royal de Paris, of the theory of conventional signs, which connects a signifier and a signified and dismisses the third term "conjuncture," which had dominated Renaissance analogical thinking.[25] Applying their theory of signs to language, Antoine Arnauld and Pierre Nicole separated sign from similitude, theorizing a rupture between imitation and convention.[26] The military engineers of the following generation introduced the traditional practices of cartography and architectural representation into the sphere of convention, in particular by applying different hues. This graphic semiology, which Jacques Bertin analyzed in the twentieth century, allows us to think of the distinction between natural and conventional signs within the realm of color.[27] Conventional signs, detached from mimesis, can result only from an agreement; natural signs serve to relieve memory, facilitate spontaneous reading, and preserve the power of immediate evocation. Since its beginnings, traditional mapmaking seems to have privileged natural signs; its purpose was to provide the reader with the spectacle of the world, not the key to it. Such are the signs of one of the oldest maps known in the Western world, the *Tabula Peutingeriana*, dated to the fourth century CE: a double tower indicates a way-stage city; a square building with a courtyard, a spa city; a simple building, a temple; a building with several roofs, a granary.[28] Later, and in parallel with cartographers, military mapmakers established signs that were less and less natural, according to a scale of iconicity determined in 1980 by Abraham Moles, and one that occurs in other spheres, such as technical graphic languages.[29] Color belongs to this repertoire of signs, between the imitation of visible nature (the green of a pasture) and abstraction (the red of a road). It also plays a special role in relation to conventional signs, as demonstrated in the 1765 entry "lavis," in Denis Diderot and Jean Le Rond D'Alembert's *Encyclopédie*: "To *wash a plan* is to lay onto the various parts the colors it is agreed to use to distinguish each of its parts."[30] This entry reminds us that color's first and most important quality is its capacity to

create distinctions, and in that respect it acts like language, according to Ferdinand de Saussure's statement that "in language there are only differences."[31] For French historian Michel Pastoureau, color's primary function, in the image—as in society, for that matter—is neither aesthetic nor artistic, but taxonomic.[32] It aids in classifying, distinguishing, associating, contrasting, and hierarchizing. We will see that, as regards architecture on paper, this axiom was certainly true for part of its history, when French military engineers were codifying the conventional usage of color, but this interpretation is less convincing with regard to architects in the second half of the eighteenth century, when color's capacity for affect acquired a new importance. Thus, the reasons for employing color shuttled between taxonomy and aesthetics, depending on whether architects were adopting the graphic language of engineers or that of painters; but color would never fully replace monochrome drawing in its essential function of transmitting measurable information.

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In order to retrace the history of the use of color in architecture on paper, I have relied chiefly on objects that serve as means of communication between two worlds that spoke different languages: architectural professionals and laymen, whether the latter were clients or members of the public. I thus chose to focus this study on presentation drawings, prints, and exhibition drawings—rather than working sketches and execution drawings made for workers, for example—although I will touch on certain uses of color that appear in architectural productions on paper as a whole.[33] By emphasizing this first kind of drawing it is possible to discuss, in dialogue with its imitative and conventional roles, color's capacity for affect, something largely absent from work or execution drawings. To the extent that the actors with whom I will be concerned were not mainly preoccupied with investigating the scientific aspect of colors, I will not address advances in that area, nor the numerous efforts to classify colors, even though the Newtonian revolution would foster changes in how they were perceived. It has long been the case that most of the studies related to the history of color have been either histories of reproductive technology and techniques,[34] histories of pigments and of pictorial practices,[35] or histories of theories of the nature of color, its semantics, and attempts to classify it.[36] However, almost nothing has been written on the history of the use of color in the representation of architecture, either by architectural historians or by historians of color.[37] The latter operate in a field that has become particularly dynamic in the wake of studies by Michel Pastoureau and John Gage. Nowhere in Gage's three important publications on color (1993–2006), for example, is there any reference to the connections between architectural drawings and polychromy, and architecture is mentioned only briefly.[38] Architectural historians have tended to focus on the use of color in built architecture, either in the context of restoration,[39] or as a means of tracing the great nineteenth-century European debates on ancient Greek temples and those of turn-of-the-twentieth-century modernism;[40] they have largely neglected works on paper for their own sake, treating them as mere

reflections of built structures. One of the most pragmatic reasons for this absence of investigation of color in works on paper is the long tradition of publishing architectural drawings in black and white, for reasons of cost and because of an assumption that color is not necessary to the appreciation of the essential qualities of architectural drawings. By applying art-historical methods to objects hitherto considered primarily in terms of their informational value, we are able not only to rethink the place of artistic and scientific disciplines in the early modern era, but also to delineate cultural geographies throughout Europe. This study will demonstrate that there were a number of national traditions of using color, from the start of our journey, in an Italian Europe faithful to monochromy, to a polychrome French Europe, where we will end, at the turn of the nineteenth century. It was then that the French state codified conventional colors, and the architects of the École des Beaux-Arts aligned themselves with artists, setting themselves apart from engineers by their triple deployment of color—as imitation, convention, and affect—within a graphic architectural pedagogy destined to conquer the globe.

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