

Introduction 1

PROLOGUE Architectures in Black and White 13

Painters' Colors, Architects' Black and White 13

Monochromy and Italian Europe 21

CHAPTER ONE Imitative Colors 31

Painting Elevations 32

Architectural Plans and Mapmaking 52

CHAPTER TWO Conventional Colors 79

Military Engineers as Cartographers and Builders 80

The Architects' Conventional Colors 100

The Convention of Pink for Masonry 118

CHAPTER THREE Affective Colors 147

A World in Color 149

Architectural Paintings 165

From Triumphant Polychromy to Sublime Monochromy 190

CONCLUSION The Anxiety of the Architect 207

APPENDIX The Draftsman's Tools 219

Whiteness and the Nature of Drawing Paper 221

Colored Chalks 224

Tools and Mechanical Aids 226

Drawing Curved Lines 229

Quills, Pens, and Brushes 231

Writing Inks: Brown, Black, and Red 232

Artists' Pigments 234

Acknowledgments 237

Notes 241

Bibliography 256

Index 271

Image Credits 278

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.

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 x 86 cm. Museo Civico di Palazzo Tè, 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.

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



5. Louis-Charles Dupain de Montesson, *La Science de l'Arpenteur dans toute son étendue augmentée du Spectacle de la campagne exprimé par des couleurs sur les plans et sur les cartes*, 4th ed. (Paris: Gœury, 1813), n.p.

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.

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.



INDEX

Note: Illustrations are indicated with *italic* page numbers.

A

abstraction, 8, 21, 75, 100; cartography and, 31, 34, 52–53, 55, 57, 71; military engineers and, 211; in plans, 75, 100–103
 Academia de San Fernando, Madrid, 138–139, 170, 185
 Académie de France, Rome, 165–166, 184–185
 Académie de Saint-Luc, Paris, 180
 Académie des Arts, Bordeaux, 182
 Académie des Beaux-Arts, Paris, 118
 Académie des Beaux-Arts, Toulouse, 183, 192
 Académie Royale d'Architecture, Paris, 80, 121, 125, 165, 167, 170, 183–184, 190–191, 193–205
 Académie Royale de Peinture et de Sculpture, Paris, 149, 165, 167; Salon of, 167, 176, 180, 182
 Accademia di San Luca, Rome, 121, 128, 135, 137, 139, 145, 176–177, 185
 Ackerman, James, 4
 Adam, James, 115, 116, 133, 133, 166
 Adam, Robert, 115, 116, 133, 133, 151, 166, 169, 171
 Adelcrantz, Carl Frederik, 128–129
 Adelcrantz, Gören Josuae, 128–129
 Adolf-Frederik, King of Sweden, 130
 affective color: and audience, 145, 148–149, 167, 213; and cartography, 173–174; and civil engineering, 173, 173–174, 211; definition of, 2, 7, 10, 145, 147–149; in garden and landscape designs, 171–172; and interior design, 149–154, 151, 152–153, 171; and market for prints, 167; and sensualism, 148–149, 151, 170–171
 Agnano villa, 23
 Alberti, Leon Battista, 3, 16, 19, 21, 59
 Algarotti, Francesco, 165
 Allard, Carel, 154
 Alpers, Svetlana, 68
 Altdorfer, Albrecht, 17, 17
 amateurs, 28, 161–162, 176, 182, 220
 Amato, Giacomo, 134

Amiens, 13–15, 82, 83
 Amsterdam, 42–43, 46–47, 128; as cartography center, 64–65, 71–72, 75, 104, 208; cityscapes of, 37–38; as printing and publishing center, 68, 154
 anatomy and anatomical prints, 18, 19
 Anfiteatro Castrense, Rome, 142, 143
 antiquity, 1, 15, 19, 21, 43, 55, 72, 81, 145, 164, 184, 191, 208, 226, 231
 Antoine, Jacques-Denis, 104–105, 105, 182
 Apianus, Peter Beinewitz, known as Petrus, 54
 aquatints, 154, 157–160, 204
 architects: as draftsmen, 167, 170, 177, 186–188; education and, 209; and military engineers as influence, 97–98; professional identity, 3–8, 11, 16, 34, 40–41, 47–49, 147–148, 214–215, 217; and scientific activity, 147, 204; as visual artists, 11, 21, 147, 167–170
 architecture, as discipline: between arts and sciences, 4, 6, 21, 179, 208, 215, 217; and construction, 3, 21, 22, 42–43, 46–47, 147, 179, 202, 210, 214, 215; as distinct, 3–6, 8, 11, 16; and geometry, 8, 21; and natural signs, 71; and shape of objects, 3
 Arch of Constantine, Rome, 144, 145
 Arch of Titus, Rome, 163
 Ardemans, Teodoro, 137–138
 Argus, Mercury, and Io (van Campen), 45
 Aristotle, 6–7, 35
 Arnauld, Antoine, 8
 Arts and Sciences (Tessier), 2
 atlases, 64–65, 65, 66, 82, 87, 244n19
 auction sales, 165, 167, 180
 audience: affective color and non-professional, 148–149, 154; clients or patrons as, 10, 32–33, 43, 68, 110, 116, 180; and exhibition culture, 179–182, 186, 188, 190; printing and commercial, 154–156, 160, 210; tourism and market for architectural prints, 161, 210; workers and execution drawings, 10, 43, 106, 106, 116–117

B

Bachelier, Jean-Jacques, 156, 180
 Baillet de Saint-Julien, Guillaume, 167

Bails, Benito, 170
 Balducci, Filippo, 80
 Barbari, Jacopo de', 37
 Barbaro, Daniele, 21
 Barcelona, citadel, 96, 97
 Barongi, Giovanni, 144, 145
 Bastide, Jean-François de, 149
 Bâtiments du Roi, France, 35, 36, 101, 115–116, 124, 125, 128–129
The Beautiful Virgin of Regensburg (Altdorfer), 17, 17–19
 Belli, Pasquale, 135, 136
 Bellini, Gentile, 36, 38
 Bérain, Jean, 180
 Berckenrode, Balthasar Florisz. van, 59
 Berckheyde, Gerrit Adriaensz, 38, 41
 Bernini, Gian Lorenzo, 108
 Bernis, François-Joachim de Pierre de, 185
 Berthier, Jean-Baptiste, 212
 Berthier, Louis-Alexandre, 212, 212, 214–215
 Bertola, Pio Giulio, 104
 Bidasoa river, 111
 Billaudel, Jean René, 191
 Billingsley, Henry, 58
 bird's-eye views, 36–37, 57, 77
 black: affective uses of, 204; in aquatints, 158; conventional uses of, 111, 209, 215; in intaglio, 154; as non color, 1, 3; pigments used for, 225–226, 232–234; writing inks, 81, 232–233, 234
 Blaeu, Joan, 64
 Blaeu, Willem Jansz., 64
 Bleyswyck, Dirck Evertsz. van, 38
 Bloemaert, Abraham, 131
 Blois, château, 32, 33, 100, 100–101
 Blondel, Jacques-François, 131, 149–151, 167, 180, 213
 blue: cartographic uses of, 55, 57, 57, 71–72, 75, 93; conventional uses of, 32–33, 72, 82, 109, 115–116, 173, 236; imitative uses of, 32–33, 47, 57, 62, 75, 81, 87, 115, 173, 193; pigments used, 72, 113, 193, 201–202, 232, 234; for shading, 55, 236
 boards, drawing, 220, 223
 Boffrand, Germain, 166
 Boileau, Étienne, 148
 Bonnet, Louis-Marin, 156–157, 158

Borromini, Francesco, 108, 108, 225
 Bos, Jacob, 20
 Boscoli, Andrea, 80
 Bottari, Giovanni Gaetano, 167
 Bouchardon, Jean-Baptiste, 128
 Boulengier, Jean, 81
 Boullée, Étienne-Louis, 170, 182, 188, 202–204, 204, 210, 215
 boundaries, 2, 55–57, 64, 71, 104, 208
 Bousquet-Bressolier, Catherine, 86–87
 Bowood, 133
 Bramante, Donato, 19, 19, 21–22, 116, 118
 Braun, Georg, 64, 75, 76, 77
 Bray, Salomon de, 41–42, 42, 208
 Breau, Pierre, 111, 117, 118
 Breslaw [Wrocław], 74, 75
 Breydenbach, Bernhard von, 36–37
 bricks, representation of, 32–33, 35, 43, 47, 74, 81, 110, 117, 120, 123–124, 137, 143, 208. *See also* red, for masonry in elevation; red, for masonry in section
 bridges, 34, 35, 91–92, 173, 185, 186
 Britain. *See* United Kingdom
 British Isles, 53, 53
 Brongniart, Anne-Louise, 202–203
 Brown, Patricia Fortini, 36
 Bruand, Libéral, 129, 129
 brushes, 231–232
 Buchotte, Nicolas, 92–95, 97–98, 121, 209, 213, 222–223, 226, 231, 234–235
 Buisseret, David, 82
 Bullet de Chamblain, Jean-Baptiste, 116, 117
 Burke, Edmund, 148, 192
 Burlington, Richard Boyle, Earl, 130–131, 207

C

Call, Jan van, 154, 155
 Camillo, Giulio, 20
 Campana, Giovanni, 192, 193
 Campbell, Colen, 207
 Campen, Jacob van, 42–43, 45, 208
 Campfranc fortress, 81, 81
 Canaletto, Giovanni Antonio Canal, known as, 165
 Capel, Horacio, 95
 Cappella della Sacra Sindone, Turin, 104
capricci. *See* fantasies and *capricci*, architectural
 Carpaccio, Vittorio, 36
 Carpi, Ugo da, 17
 Carpo, Mario, 20
 cartography: and abstraction, 31, 34, 52–53, 55, 57, 71; and affective colors, 173–174; audience for maps, 58, 64–66, 68, 207, 208; and color printing, 62–63, 156–157, 158; and conventional colors, 58, 71–72, 74–75, 79, 84–86; hand-coloring of maps, 63–66, 68–71, 207, 208; judicial, 55–58, 207–208; manuals

of, 59, 71–72; maps, definition, 54; maps as paintings, 55, 66, 173, 173 (*see also* hand-coloring *under this heading*); maps depicted in paintings, 68, 70; military engineering and, 80, 212–213; and natural signs, 8, 52–54, 58, 62–64, 68, 71, 72, 74–75, 98; and politics, 66–68, 71–72, 93; and scale, 55, 62; and surveying (*arpentage*), 40, 53, 56–62, 92, 96, 98, 100, 104, 110, 208; and symbolic systems, 55, 71; tapestry maps, 67; and taxonomic colors, 10, 53–55, 75, 208–209
 Cassas, Louis-François, 185
 Cébazat, Pierre de, 15
 Celers, Zacharie de, 55
 Cennini, Cennino, 15
 Cerceau, Jacques I Androuet du, 32–33, 33, 100, 100–101
 Cesariano, Cesare, 20
 chalks, 156, 222, 224–225
 Chambers, William, 115, 131–133, 170, 182, 185, 186, 209
 Chardin, Jean-Baptiste-Siméon, 156, 157, 223
 Cherpitel, Mathurin, 165
 chiaroscuro, 7, 16, 17, 148, 203–204, 210
 Cholmondeley Codex, 226
 chorography, 54
 chromophobia, 6–7, 21, 34–35, 214, 254n9
 city views, 36–38, 207–208; “assembly line” view of Florence, 37; German Stadtbilder, 37; maps included in, 37; military engineers and city maps, 60–61, 80–81
 civil engineers, 90–92, 96, 98, 147, 172–174, 173, 210–211, 234
 Clagny, château, 101, 101, 118
 Clement VI, pope, 15
 Clérissieu, Charles-Louis, 131–132, 165–166, 168
 codification of color: military engineers and, 79, 84–86, 91–92; role of manuals in, 58, 68–72, 75, 90–97, 209
 Coecke, Peter, 42
 Coehoorn, Menno Van, 123
 Cojannot, Alexandre, 111, 225, 231
 Colbert, Jean-Baptiste, 62, 82
 collecting, 164, 165, 176, 180
 Collège des Quatre Nations, Paris, 106
 Colmoulins, château, 150, 152–153
 colorists, 3, 64, 68, 71–72, 75, 166, 194–202
 communication: color and disambiguation, 29, 91–92, 97, 199–200, 204–205, 209; and color as language, 8–10, 58, 77, 79, 84, 95–96, 98, 209, 213; and text on drawings or maps (*see* legends); to workers, 43
 compasses and dividers, 32, 226, 229–230, 230; as attribute of architects, 3; *bussola della calamita* (magnetic), 62
 competitions and prizes, 121, 125–126,

135–137, 145, 172, 173, 176–177, 190–193, 205, 210, 227
 composition, 170
 Condillac, Étienne Bonnot de, 148
 construction, architects and, 3, 21, 22, 42–43, 46–47, 147, 179, 202, 210, 214, 215
 Contant d’Ivry, Pierre, 167, 180
 conventional color: codification and standardization of, 11, 58, 77, 79, 81–85, 87, 90, 97–98, 100, 109–110, 209, 211–213; and consensus, 75–77, 79, 81–82, 94, 108–109, 115, 121, 209, 211; defined, 1–2, 7–8, 75–76, 94, 97–99, 172–173; diffusion and adoption of, 58, 90, 95, 128, 147–148; and disambiguation, 97, 199–200; and elimination of legends, 95–96; as signs, 97–98
 Cornide, José, 138, 139
 Cotte, Robert de, 115, 124, 128, 231
 Cronstedt, Carl Johan, 127–129
 Croome Court, tapestry room, 150, 151
 Crozat, Pierre, 156, 176
 Cruyl, Lievin, 37
 Cure, Cornelius, 22–24
 curved lines, drawing aides *vs.* calculation of, 230

D

Dainville, François de, 72
 Daly, César, 211
 Danckerts, Cornelis, 41–42, 112, 113, 117, 123, 123, 154, 155
 Dapper, Olfert, 38, 40
 Dausse, Joseph-Henri, 211
 David, Jacques-Louis, 148
 da Vinci, Leonardo, 22, 59; map of Imola by, 59, 60–61
 Davis-Allen, Lisa, 71
 Dee, John, 58
De humani corporis fabrica (Vesalius), 18
 de l’Orme, Philibert, 34–35
 Demarteau, Gilles, 156
 Démoris, René, 148
 Derizet, Antoine, 128
 descriptive geometry, 204, 215–217
 Desmaisons, Pierre, 159, 160
 Desprez, Jean-Louis, 163–164, 182
 Deswart-Rosa, Sylvie, 32
 Deventer, Jacob van, 64
 De Wailly, Charles, 132, 180, 181, 182, 188
 Dietterlin, Wendel, 19
 Dilich, Wilhelm, 49, 50–51, 52
 discoloration, 68, 213, 234
The Ditchley Portrait (Queen Elizabeth I) (Gheeraerts the Younger), 67–68, 69
 Dixon, John, 186
 Dortsman, Adriaen, 128
 Dou, Jan Pietersz., 59
 drawings, architectural: and architects as draftsmen, 3–4, 34, 186–188,

215; as autonomous works, 3–4, 47, 176–177, 179–180, 186, 210–211, 215; commercial market for, 176, 180, 182–184; and competition, 125, 177, 183, 190–193; as distinct from color renderings, 6–7; draftsman’s tools and, 228, 235; engraving process and reproduction of, 194–195; epistemological function of, 19; execution, 10, 43, 47, 106, 116–117; exhibition, 10, 132–133, 179, 185, 186, 190; presentation, 10, 15–16, 26, 34–35, 41, 43, 62, 63, 112, 135–137, 145, 148–149, 179–180, 183, 192, 222, 242n33; size and scale of works, 190–192; working, 10, 106–107

Drolling, Martin, 224

Drottingholm, La Confidence pavilion, 130

Dubut, Louis-Ambroise, 205

Ducros, Abraham-Louis-Rodolphe, 163, 163, 164

Dumanet, Louis, 202, 203

Dumont, Gabriel-Pierre-Martin, 100–103, 102, 182

Dupain de Montesson, Louis-Charles, 8, 9, 94–95, 103–104

Dupérac, Étienne, 1, 37

Dupuis, Charles, 171–172

Dupuis, Sophie, 165

Durán, Jorge, 139, 140–141, 192

Durand, Jean-Nicolas-Louis, 159, 159, 204–205, 211, 230

Dürer, Albrecht, 59

E

earth, representation of, 72, 81–82, 86, 97, 110

Eck, Caroline van, 21

École des Arts, Paris, 131–132, 180

École des Beaux-Arts, Paris, 11, 205, 211, 215

École Gratuite de Dessin, Paris, 156, 180

École Militaire, Paris, 98

École Polytechnique, Paris, 204–205, 211

empiricism, 148

engineering. *See* civil engineers; military engineers

England. *See* United Kingdom

erasers, 225–226

Escobar, Jésus, 67

esquisses. *See* sketches

Établissement de la Correspondance Générale sur les Sciences et les Arts, 182

exactitude, 20–21, 179

execution drawings, 10, 43, 106, 116–117

exhibition culture: and academies, 184–190; and architectural drawings as autonomous works, 176–177; and exclusion of architects, 182–183, 185–186, 188; in France, 176–182, 188;

in Great Britain, 132–133, 185–188; in Italy, 184–185; the public and evaluation of architectural drawings, 186, 188–189; in Spain, 185

F

Fairchild, Cissie, 156

Falmouth, MA, 212

fantasies and *capricci*, architectural, 4, 167, 176, 177, 178

Farington, Joseph, 186–188

Fel’ten, Yuri, 130, 131

Ferguson, Eugene, 8

Folding, Pierre-Gustave, 157

Folkingham, William, 58

Fonkenell, Guillaume, 117–118

Fontaine, Pierre-François-Léonard, 159, 164, 164–165, 179, 184, 201, 203, 230

Fontana, Carlo, 28, 130

Fonthill Abbey, 186, 189

Foppa, Cristoforo Caradosso, 19

forests and trees, depiction of, 57–58, 62, 98, 101–103, 171–172, 199, 247n60

Formosa (present Taiwan), 66

fortifications, 1–2, 6, 15, 59, 81–82, 90–92, 97–98, 123–124, 235

Fort-Royal de la Martinique, courthouse and prisons, 110

Fossé, Charles-Louis, 156–157, 158

Foucault, Michel, 8

Fra Giocondo, Giovanni, 20

France: centralizing policies and standardization in, 79, 82, 96, 209, 211–213; Dutch influences in, 82, 121–123; exhibition culture in, 176–182, 188

François, Jean-Charles, 156–157

Froideau, Thomas, 191, 191

Frommel, Christoph Luitpold, 16

Fuhring, Peter, 32

G

Gabriel, Ange-Jacques, 111

Gabriel, Jacques V, 124

Gady, Alexandre, 62

Gage, John, 10

Galleria Farnese, Rome, 161, 162

Gallet, Michel, 182

Gandy, Joseph Michael, 188, 190

garden designs, 53, 62, 100–104, 102, 170–171

Garric, Jean-Philippe, 165, 194

Gauthey, Émiland-Marie, 92

Gautier Dagoty, Jacques-Fabien, 156, 157

Gautier de Nîmes, Henri, 64, 90–94, 101, 149, 209, 214, 233–234

geology, 104

geometry: architecture and, 8, 21–22, 35, 147, 179, 230; cartography and, 58, 80–81; descriptive, 215–217; engineering and, 86, 96

Gerbino, Anthony, 62

German lands: and cartography, 57–59, 75; and color printing, 17; and conventional color, 94–95, 128; and imitative color, 49, 74; *Lüftmalerei* (painted façades) in, 49; and manuscript illumination, 35–36, 49, 207–208; and Stadtbilder (city views), 37, 75, 208

Gheeraerts, Marcus, the Younger, 67–71, 69

Ghiberti, Bonaccorso, 21–22

Giannini, Eustaquio, 136

Gibbs, James, 28

Gilpin, William, 170–171

Giotto, Giotto di Bondone, known as, 15, 17, 207

Girardin, René-Louis de, 171

glass, representation of, 112–115

globes, 2, 58, 65, 66

Glomy, Jean-Baptiste, 176

Gobelins convent, Paris, 55–56, 56

Goeree, Willem, 68–71

Goltzius, Hendrick, 43

Gombrich, Ernst, 7

Gómez de Mora, Juan, 112, 137, 137

Goodman, Nelson, 4, 7

Gotha, orangerie, 103, 103

Grand Tour, 131, 161, 166, 170, 210

Grasselli, Margaret Morgan, 156

gray. *See* black

green: as affective color, 151, 193; cartographic uses of, 68, 82, 87–89, 208; as imitative color, 8, 22, 23, 53, 53, 57, 57–58, 68, 72, 81, 99, 101, 101–103, 102, 103, 137, 193; in interior decorating, 150–151; for Italy, 93; painterly use of, 68; pigments used, 58, 68, 234–235; for projected work, 81–82; water, as color of, 43, 53, 55, 72, 82, 87, 173, 199, 202, 208, 236; for windowpanes and mirrors, 24, 43, 112, 115, 115–116, 129; for window shutters and doors, 43, 47, 112

Grisoni, Giuseppe, 27

Groot, Erlend de, 64

Guillaumot, Charles-Axel, 170

Guillermé, Jacques, 205, 219

H

Hagia Sophia, Istanbul, 120

Hardouin-Mansart, Jules, 34, 35, 36, 124

Hårleman, Carl, 128–129, 129, 130, 150

Hauberat, Guillaume d’, 128

Haulroye, Riquier, 15

Hawksmoor, Nicholas, 26–27, 27

Hem, Laurens van der, 64–65

Hermitage Palace, Saint Petersburg, 131

Hernandez, Sofia Amanda, 161

Heyden, Jan van der, 38

Hoefnagel, Jacob, 75, 77

Hogenberg, Frans, 64, 75, 76

Hole, William, 73

Holland. *See* United Provinces
Hôtel de Bourvalais, Paris, 116–117, 117
Hôtel-Dieu, Amiens, 13–15, 14
Hôtel Le Blanc, Paris, 115
Houel, Vincent, 110
Hove, Bartholomeus Johannes van, 46
Huber, Michael, 161–163
Hubert, Robert, 165, 166, 170, 180, 223
Huis Vredenburg, Beemster, 47
Huret, Grégoire, 142
Hurx, Merlijn, 40
Huygens, Constantijn, 38, 43

I

Île de Ré, 87, 88–89
illumination, 35–36, 49, 62–64, 207–208
imitative color: and convention, 8, 75, 123, 172–173; and interior design, 154; and material represented, 29, 110, 207; mimesis and, 2, 6–8, 21, 28–29, 53, 68, 148, 173, 210; painting and, 47, 68, 93–94; Platonic bias against, 6–7. *See also* specific hues
Imola, 60–61, 80–81
Imperial Academy of the Arts, Saint Petersburg, 94, 130, 176, 227
improvement, ideology of, 57–68
India ink, 111, 138, 233–234
ink: for typographical *vs.* copperplate printing, 16; writing, 16, 81, 232–234
intaglio, 154
interior design: and affective use of color, 149–154, 151, 152–153, 171; as architect's responsibility, 149, 210; conventional color in interior elevations, 112–113, 115, 121, 209; and imitative color, 154; maps as decor, 68; “populuxe” commercial market for, 156; textile in, 150; wallpapers, 150–151
Invalides, Paris, 129
Italy: and audience for maps, 66; centralizing policies and standardization in, 96–97; and conventional color, 192; French influence and conventional color in, 137; monochromy in, 11, 20–22, 33, 128, 134–137, 209–210; and Palladian influence in United Kingdom, 26, 28, 130–133, 207; Spanish monochromy and influence of, 137–138, 143–145

J

Jabach, Everhard, 176
Jagodina, 80
Janinet, Jean-François, 158–159, 159
Johanson, Johannes, 75, 76
Jones, Inigo, 24–26, 25, 130–131, 207
judicial maps, 55–56, 56, 207
Julienne, Jean de, 156
Jungmann, Jean-Paul, 4

jurisdiction or use, color and demarcation of, 104, 104–105, 105
Juvarra, Filippo, 134, 134–135, 135, 138

K

Kent, William, 131, 150
Kenwood House, London, 116
Key, Lieven de, 41
Keyser, Hendrick de, 41–42
Kik, Oliver, 41
Kleinert, Markus Friedrich, 6, 6
Köbel, Jacob, 59
Kristeller, Paul Oskar, 165
Krohne, Gottfried Heinrich, 103

L

Lafreri, Antonio, 20
Lagniet, Jacques, 213, 216
Lairesse, Gerard de, 131, 149
Lallemant, Georges, 55
Lancaster, England, 73
Lanckaert, Joost Jansz., 67
landscape drawing, 62, 98, 170–171, 190, 193, 195, 210. *See also* forests and trees
land use plans, 57–58. *See also* surveying (*arpentage*)
Lartésien, Jean, 15
Lartigue, Jean Baptiste, 182–183
lazaretto (Moreau), 194–195, 194–199, 196, 197, 198
lead, representation of, 22, 33
Le Blon, Jakob Christoffel, 156
Le Blond, Alexandre, 130
Lebrun, Jean-Baptiste, 182
Le Camus de Mézières, Nicolas, 148, 151–154, 170
Le Clerc, Sebastien, 87
Ledoux, Claude-Nicolas, 170, 188, 210, 219
Lefebvre, Hugues, 55
legends, 38, 55; conventional use of color and elimination of, 95–96; and disambiguation, 71, 105–106, 108–109
Le Lorrain, Louis-Joseph, 165
Le Mans, cathedral, 15
Le Marie, Jean, 167
Lemercier, Jacques, 62–63, 63
Lemercier, Paul, 86–87
Le Muet, Pierre, 82
Le Nôtre, André, 62
Leo Belgicus (Visscher), 39
Leo X, pope, 62
Lepautre, Jean, 180
Le Prince, Jean-Baptiste, 157
Lesage, Pierre-Charles, 172, 172
Le Sueur, Eustache, *frontispiece*, 1
Le Vasseur, Jean-Charles, 98, 99
Le Vatois, 174–175
Le Vau, Louis, 106, 106, 111, 116, 121
Lichtenstein, Jacqueline, 6–7
Lille, 83, 183–184, 184

Longinus, 148
Lorenzetti, Ambrogio, 36, 66
Losada, Antonio López, 192
Lotz, Wolfgang, 22
Louis, Victor, 182
Louis XIV, King of France, 79, 82, 90
Loyola, Fermín de, 95, 97
Lussault, Claude-Thomas, 182

M

Machuca y Vargas, Manuel, 138–139
Machy, Pierre-Antoine de, 165
Maderno, Carlo, 108
Mallio, Michele, 185
Malton, Thomas, 186–188
Mander, Karel van, 43
Manesson Mallet, Allain, 80, 87, 87
Mansart, François, 107, 225
manuals, 58–59, 64, 68–72, 75–76, 90–97, 101, 156–157, 171–173, 209, 220–221
maps. *See* cartography
Mar, John Erskine, earl of, 28
Maraine, 101
marble, 17, 22, 35, 36, 135, 149
Mariette, Gilles-Charles, 123
Mariette, Pierre-Jean, 115, 165
Marinoni, Giovanni Jacopo de, 94, 94–95
Martellange, Étienne, 109, 109
masonry. *See* bricks, representation of; red, for masonry in elevation; red, for masonry in section
Masse, Claude, 87–90, 88–89, 126–127
mathematics, 8, 54, 90–91, 96, 147–148, 170
Mauritshuis, The Hague, 43, 45–46, 46, 47
McGrath, Thomas, 15
medals, 19, 19, 20, 176
Meissonnier, Juste-Aurèle, 113–115, 114
menageries, 178
Mercator, Gerardus, 58
mezzotints, 156, 157, 204
Michelangelo, 21, 22, 167
Mignot, Claude, 32
military engineers: and civil architects, 92, 100, 121; and conventional use of color, 7, 79, 81–86, 97–98; as draftsmen, 15, 80, 86–87; history of, 80–83, 90, 95–97, 211–212; manuals and textbooks for, 90–95; and natural signs, 81; and wooden models, 83
Milizia, Francesco, 167
mimesis. *See* imitative color
Mique, Richard, 165
mirrors, 115–116
models, wooden, 16, 43, 46, 47, 83, 143, 177
Moles, Abraham, 8
Monath, Peter Conrad, 94
Monge, Gaspard, 215
Monnaie, Paris, 104–105
Monnerie, 62
monochrome/monochromy: and ancient ruins, 21; Boullée and, 202–204;

definition of, 2–3; and Gothic novels, 204; Inigo Jones and, 24–25; and Italy, 11, 20–22, 134–137, 209–210; and line drawings, 13; and pictorial effects, 135–137, 202–203; prints, 16; and publication of architectural drawings, 11; and the sublime, 203–204; and universality, 20
 Monte, Gian Tommaso, 96
 Montjeu, château, 62, 63
 Mora, Francisco de, 137
 Moreau, Jean-Charles-Alexandre, 119, 119, 193–202, 194–195, 196, 197
 Moreau, Louis Gabriel, the Elder, 180
 Moreelse, Paulus, 42
 Morris, Robert, 170
 Mount Tranquility, Saint-Domingue, aqueduct, 206, 211, 211
 Moya, Luis, 4
 Müller, Christoph, 108
 Munar, Juan Antonio, 139

N

national palettes, 72
 Natoire, Charles Joseph, 166, 233
 natural signs: and architecture, 71, 208–209; and cartography, 8, 52–54, 57, 58, 62–64, 68, 71, 72, 75, 81, 208–209; and conventional signs, 97–98; printing and standardization of, 64
 Nègre, Valérie, 182
 Netherlands. *See* United Provinces
 Neumann, Balthasar, 6, 6
 Newman, John, 131
 Nicole, Pierre, 8
 Niederländer, Hans, 112
 Nooms, Reiner (Zeeman), 38
 Nuremberg, 33, 58

O

oblique views, 16
 Office of Works, United Kingdom, 26, 130–131
Officer and Laughing Girl (Vermeer), 70
 Oldcotes manor, Nottinghamshire, 24
 Olgiati, Gianmaria, 81
 Oppenord, Gilles-Marie, 124, 125, 180
 Orbay, François d', 106, 121
 Orgeix, Émilie d', 84
 Ortelius, Abraham, 37, 58, 68, 72
 Ottenheim, Koen, 43
 Ozanam, Jacques, 92

P

painted façades (*Luftmalerei*), 49
 painting: and cartography, 55, 66, 68, 173; collaboration between architects and painters, 15, 32–34, 150, 188; depiction of architectural drawings in, 1–2, 2,

frontispiece; and imitative use of color, 47, 68, 93–94; painter-architects, 16, 21–22, 41–49, 163, 165, 166–170, 180–182, 208
The Palace of Frederick V (Saenredam), 43, 44
 Palais de Justice, Paris, 160
 Palais Royal, Paris, 33–34, 34
 Palladio, Andrea, 21, 25, 25, 40, 118, 165, 207; Britain and Palladian monochromy, 26, 28, 130–133, 207
 Panini, Francesco, 161–163, 162
 Panini, Giovanni Paolo, 161, 165–166, 166, 182
 Panseron, Pierre, 98–99, 99, 165, 182, 194
 paper, 3, 10, 221–223, 232; sheet size and scale of drawings, 191, 222
 parchment, 14, 15–16, 16, 53, 56, 57, 221
 Paris, Matthew, 53, 53, 208
 Pâris, Pierre-Adrien, 150, 152–153, 225
 Parmigianino, Girolamo Francesco Maria Mazzola, known as, 17
 Pasti, Matteo de', 19
 Pastoureau, Michel, 4, 10, 204
 Peacock, James, 154
 Pécheux, Laurent, 132, 135
 pedagogy: and conventional use of color, 90, 94–98, 138–139, 210
 pencils, 225
 pens, 231
The Pentecost (de Bray), 42
perches as measurement, 62
 Percier, Charles, 159, 164, 164–165, 230
 Perrault, Claude, 19
 Perronet, Jean-Rodolphe, 172
 perspective, 15–16, 21–22, 91, 148, 163
 Peruzzi, Baldassare, 21–22, 62, 107–108, 207
 Petcu, Elizabeth, 19
 Peter the Great, Emperor of Russia, 227
 Petit-Radel, Louis-François, 182, 183
 Peyre, Antoine-François, 182
 Peyre, Marie-Joseph, 132, 165, 182
 Phalsbourg, 78, 86, 86
 Philo-Architectus (pseud.), 185–186
 Picon, Antoine, 8, 147, 172–173
 picturesque, 170
 pigments: bister, 27, 179, 192–193, 233, 234; black, 225–226, 232–234; blue, 72, 113, 193, 201–202, 232, 234; draftsman's box pictured, 235; green, 58, 68, 234–235; instructions in *Mappae clavicula*, 90; red, 72, 225, 233–234; yellow, 58, 68, 163, 232, 235
 Piles, Roger de, 7, 93–94, 149
 Pinet, Antoine du, 54
 pink. *See* red
 Piranesi, Francesco, 163–164
 Piranesi, Giovanni Battista, 120, 120, 135, 137, 171, 176, 177, 179, 186, 204, 210, 233
 Pitzhanger Manor, Ealing, 190
 Plato, 6–7

poché, 215
 Poisson, Louis, 67
 Pontanus, Johannes Isaac, 37–38
 Ponts et Chaussées, 90–92, 172–173, 234
 Post, Pieter, 42–44, 46, 47, 208
 press, architectural, 185, 188, 190, 211
 Prévost, Jehan, 15
 Prévôt, Guillaume, 14, 15
 Prieur, Amant-Parfait, 165, 194–195, 197, 199, 199
 prints: aquatints, 154, 157–160, 204; and chromatic signs in architectural drawings, 62–64; in color *vs.* hand coloring, 16, 63; and hand-tinting, 68–71, 160–165, 194–201; inks, 16; intaglio, 154; market for, 16, 19, 154–156, 161, 164–165, 194, 210; mezzotints, 156, 157, 204; and scale, 195; technical, 20, 219
 Probst, Georg Balthasar, 160, 161
Procession of the True Cross (Bellini), 36–37, 38
 professionalization. *See* architects; civil engineers; military engineers
 Ptolemy, 54
 public, 10, 62, 133, 179–180, 182–186, 188, 190, 210–211, 213–214, 217

Q

Quatremère de Quincy, Antoine-Chrysostome, 179, 202
Queen Elizabeth I (The Ditchley Portrait) (Gheeraerts the Younger), 67–68, 69
 quills, 231

R

Rana, Carlo Andrea, 96–97, 98
 Raphael, Raffaello Sanzio da Urbino, known as, 21–22, 59–61, 62
 Rastrelli, Francesco Bartolomeo, 130, 143, 145
 Ray, Diodato, 136
 Recht, Roland, 4
 red: affective use of, 144, 145, 151; antique and medieval uses of, 72–75; cartographic conventional uses of, 13, 32, 55, 71–75, 99, 100, 116, 208–209; chalks, 225; for color printing, 156; for corrections, 107, 109; different use for military and civil plans, 84, 110–112, 209; and function or jurisdiction, 104–105; imitative uses of, 32, 57, 120–121; inks and pigments, 13, 72, 81, 225, 233–234; for levels, 106, 106; for masonry in elevations, 117, 118, 118; for masonry in section, 28, 35, 81, 82, 95, 118–129, 122, 124, 125, 126–127, 138; for masonry joints, 117; for paintings in elevations, 115–116, 125, 129; for projected work, 81, 86, 95, 97, 97, 106–112, 108, 209, 213; and transition from natural to conventional signs, 74–75, 208–209

Regie Scuole di Artiglieria e Fortificazioni,
Turin, 96–97
Régnier-Roux, Daniel, 32
Reichenberg, castle, 50–51
renderings (*rendus*), 177, 191, 223
Renou, Antoine, 179
Reuwich, Erhard, 36–37
Revell, John, 22
Rheinfels, castle, 49, 52
Rietvelt, Cornelis Gijsbertsz., 128
roads, 8, 71, 74, 74
Rode, Augustus, 226
Rodríguez, Ventura, 138–139
Roman, Jacob, 49
Romano, Giulio, 3
roofs, 32, 47, 49, 55, 75, 104, 125, 137,
242n17
Rosselli, Francesco, 37
Rowe, Colin, 170
Royal Academy of Arts, London, 176, 185,
188
ruins, 43, 62, 142, 166, 166, 168, 169, 207
Russia, 128, 130, 209, 227

S

Sabatini, Francesco, 138
Sacchetti, Giovanni Battista, 138
Saenredam, Pieter Jansz., 43, 44
Saint-Aubin, Gabriel de, 180
Saint Paul's Cathedral, London, 22, 26, 26,
27, 187
Saint Peter's Basilica, Rome, 62, 103, 108,
108, 118, 180
Saint Petersburg, Russia, 161
Saint-Sulpice, church, Paris, 113, 180, 181
Sainz, Jorge, 4
Salciat, Pierre, 15
Salmon, William, 71–72
Salon de la Jeunesse, Paris, 182
Sandby, Paul, 158
Sandby, Thomas, 185, 187
Sangallo, Antonio da, 22
Sangallo, Giovanni Francesco da, 22, 23
San Giacomo degli Incurabili, church,
Rome, 108
San Giovanni in Laterano, basilica, Rome,
120, 135
San Pietro in Montorio, church, Rome,
136, 137
Santen, Dirk Jansz. van, 64–65
Santos Martínez, Dámaso, 138
Saussure, Ferdinand de, 8–10
Sauveur, Joseph, 90, 91, 123–124, 124, 227,
229, 230
Savage, Nicholas, 185–186
Savoy, 81, 93, 96–97
Saxton, Christopher, 68, 71, 73
scale, 15, 55, 57, 95; and affect, 192–193;
cartography and, 62; engravings and
reduction of, 194–195
Scamozzi, Vincenzo, 21, 40, 167

Schlaum, Johann Conrad, 128
Schwenter, Daniel, 58
Scotland. *See* United Kingdom
sculpture and sculptors, 22, 32, 34, 40–41,
47, 112, 145, 165, 167, 170, 230
Scuola del Nudo, Rome, 185
Seghizzo, Giacomo (Friar of Modena), 15
Seheult, François-Léonard, 194
Sems, Johan, 59, 59
sensualism, 148, 151–154, 170, 171, 210
sepulchral chapel, 119, 139, 140–141, 192,
193, 203
Serchuk, Camille, 55
Serlio, Sebastiano, 20–21, 118, 119
Servandoni, Giovanni Niccolò, 4–6, 5, 165
Sgrooten, Christian, 64
shading and shadows, 16, 47, 55, 93, 95,
101, 132, 199, 202; Boullée and theory
of shadows, 203–204
Sienna, campanile, 16
signs: French theory of, 8, 92
Silvestre, Israël, 37
Skelton, Raleigh, 54–55
sketches (*esquisses*), 177, 178, 179, 191
skies, 1, 135, 154, 183, 186, 195, 201–202
Smentek, Kristel, 156
Smith, John, 71
Smolny convent, Saint Petersburg, 143,
143, 145
Smythson, Robert, 24, 24
Soane, John, 133, 163, 185, 188, 204
Soufflot, Jacques-Germain, 150, 165, 180
Spain: and conventional color, 95–96,
137–143, 192; French influence and
polychromy in, 95, 138–139; Italian
influence and monochromy in, 137–138,
143–145
Spannocchi, Tiburzio, 81, 81, 108
Stark von Röckenhof house, Nuremberg, 48
Stevens, Edward, 170, 171
Stewart, Margaret, 28
stone, representation of, 17, 33, 35, 58, 72,
81, 99, 110, 112, 117–118, 120–121,
124, 128, 143, 209. *See also* red, for
masonry in elevation; red, for masonry
in section
Strasbourg, cathedral, 13, 15
Stuart, James, 131
“subjective turn,” 148, 210
the Sublime, 148, 192–193, 202, 203, 213
surveying (*arpentage*), 40, 53, 56–59, 92, 96,
98, 100, 104, 110, 208
Swart, Pieter de, 49
Sweden, 128–130, 209

T

Taiwan (Formosa), 66
Talman, John, 27, 28
Talman, William, 27
tapestries, 67, 150, 151
taxonomic use of color, 10, 53–55, 75,

208–209, 214–215
Technische Militärakademie, Vienna, 94
temporal distinctions (projected *vs.*
completed), 81–82, 84, 88, 92, 97, 100,
106–112, 209
Ter Brugghen, Gerard, 68
Tessier, Louis, 1, 2
Tessin, Nicodemus, the Elder, 128–129
Tessin, Nicodemus, the Younger, 129
Testelin, Henri, 177
Texeira, Pedro, 67
Teyler, Johan, 154, 155
theater sets, 134, 135
Thomon, Thomas de, 185
Thornhill, James, 131
Titian, Tiziano Vecellio, known as, 3
tools and instruments, 25, 32, 58–59, 62,
226–230
Torre de Hércules, La Coruña, 138, 139
tourism, 161, 164, 210
Traverse, Jean-Pierre, 84
trees. *See* forests and trees
Tuileries Palace, Paris, 106, 121
Turin, 96–97, 104, 104, 134
Turner, John Mallord William, 186–187,
189

U

United Kingdom, 22–28, 57–58, 71, 115,
130–133, 207
United Provinces: architecture as profession
in, 40–42, 47–49; and cartography,
64–75; and cityscapes, 37–40, 208;
and conventional color, 112, 121–122;
and imitative color, 22–24, 26, 42–47,
68, 82, 121; as influence in France, 82,
121–123; influence in Sweden, 128–129;
and manuscript illumination, 35–36;
painting as influence in, 42–47, 68,
207–208
unity of the liberal arts, 165, 167
Uppsala, University library, 130

V

Vallée, Simon de la, 128
value, color, 1, 16, 55, 87, 101, 103, 105–
106, 157, 171, 192–193, 201, 208
Vanbrugh, John, 27
Varaigne, Pierre-Bernard, 211
Vardy, John, 131
Vasari, Giorgio, 21, 167, 177
Vauban, Sébastien Le Prestre de, 86–90, 92,
95, 109–111, 209; *Bezançon*, 84; Dutch
influences on, 121–124, 209; Plan of
Phalsburg, 86
Vaudoyer, Antoine-Laurent-Thomas, 177,
178, 191
Velázquez, Isidro, 142, 143
Veneziano, Agostino, 19, 19
Verboom, Cornelius, 95

Verboom, Jorge Próspero, 95, 96
 Vérin, Hélène, 8
 Verly, François, 183
 Vermeer, Johannes, 38, 68, 70, 72
 Vernet, Joseph, 201
 Versailles, Palais of, 35, 36, 117
 Vesalius, Andreas, 18
 Viel, Charles-François, 202
 Vienna, Austria, 75, 77, 94
 Vienne, Jesuit college, 109
View of the Golden Bend (Berckheyde), 41
 Villaréal, José de, 137
 Vinet, Élie, 59
 Vingboons, Justus, 47, 128, 208
 Vingboons, Philips, 43, 46–47, 47, 128, 208
 Virol, Michèle, 90
 Visitandine convent church of Sainte-Marie, Paris, 107
 Visscher, Claes Jansz., 37, 39, 64, 75, 77
 Vitruvius, Marcus Vitruvius Pollio, known as, 3–4, 20, 120, 147, 215, 226

Volaire, Pierre-Jacques, 201
 Volpato, Giovanni, 161–163, 162, 163
 Volterra, Francesco da, 108, 108

W

Waghmakere, Domien de, 41
 Waldseemüller, Martin, 63
 Warmoes, Isabelle, 84
 washes *vs.* tints, 92
 water, depiction of, 53, 57, 58, 72, 112–113, 173, 193, 199–200, 202
 Webb, John, 25
 Wijngaerd, Antonie Jacobus van, 37
 Williams, Raymond, 7
 windowpanes, depiction of, 24, 55–56, 58, 112–116
 Wittman, Richard, 188–190
 woodcuts, 16–17, 17, 19, 20
 working drawings, 106–107
 Wotton, Henry, 25

Wren, Christopher, 26, 26, 227
 Wrocław, 75, 76
 Wyatt, James, 186, 189

Y

yellow: affective use of, 149–151;
 cartographic uses of, 32, 55, 71–75, 104;
 conventional uses of, 75, 84, 92, 104, 109, 110–112, 118, 123, 137; imitative uses of, 32, 33–35, 55, 72, 75, 111–112; jurisdiction or function indicated by, 104–105; for masonry in elevation, 118; pigments, 58, 68, 163, 232, 235; for projected construction, 81–82, 84, 88, 92, 97, 108–112, 123, 123, 209; surveyors and uses of, 104
 Yenn, John, 186, 188
 York House, London, 132
The Young Draftsman (Chardin and Dagoty), 156, 157