

Industry and Ideas

Jacob Christoph Le Blon's Systems of Three-Color Printing and Weaving

Trust in connections between philosophical knowledge and artisan practices was typical among the enlightened public of the eighteenth century. Efforts to exploit those connections were often focused toward real or expected increases in consumption that would be a result of improvement—improvement to techniques, or to industry and knowledge more generally. Such expressions could be more symbolic than practicable, as the explanation of theory by practices or practices by theory proved difficult to pin down.

The work of Jacob Christoph Le Blon offers examples of eighteenth-century efforts by a knowledgeable person determined to combine practices and sciences. In the first third of the eighteenth century, Le Blon invented and exploited both a color-printing method to imitate paintings and a weaving technique to imitate tapestries. His attempts to replicate "high" art forms for consumption by a broader and presumably less elite public can be considered as early-eighteenth-century endeavors to take advantage of (and improve) growing markets for decorative works of art. Le Blon's endeavors also provide insight into eighteenth-century industrialization of two color-dependent processes. They are especially important in this context of sciences and practices because of Le Blon's belief that his inspiration and the foundation of his art were the sciences. In his writing about his inventions, as in contemporary writing by others about him, this is highlighted as a production goal and as a selling point. Le Blon was explicit about the appropriate path for such connections and his work demonstrates the reciprocity of transfer between practices and theories of color. At the same time, it demonstrates attempts to invent two new branches of industry.

Le Blon's Life

Jacob Christoph (or James Christopher, or Jakob Christoffel) Le Blon was born in 1667 into a family of artists, printers, and bookmen. His father, Christoph Le Blon, was an engraver and bookseller in Frankfurt am Main. Le Blon's mother, a daughter of the painter Matthäus Merian, was a half-sister of the artist and entomologist Maria Sibylle Merian.¹ Le Blon trained as a painter and mezzotint engraver under Carlo Maratti in Rome. Peripatetic throughout his life, at the end of the seventeenth century Le Blon was living in Amsterdam, where he supported himself as an artist, primarily a miniature painter. At this time, according to Richard Godfrey, Le Blon began to experiment with color-printed pictures.² His system used three different plates, each inked with a different color and applied in sequence to a single sheet of paper. Le Blon's studies continued even after a

move to London, about 1715. In 1719, George I granted him a patent for a technique to print pictures in color and, with a business partner and students, Le Blon set out to exploit his invention.³ The Picture Office, as the company was called, offered the public copies of pictures of famous people and portraits by famous painters. Yet despite the appeal of bringing home the notorious or revered, Le Blon's color-printed pictures never attracted clientele in the numbers he and his supporters expected, and The Picture Office failed before the patent expired.

In keeping with his background, Le Blon's broad interests in the arts extended to printed words as well as printed pictures: While living in London he published a translation (from French into English) of *Le beau idéal*, Lambert ten Kate's preface to a translation of Jonathan Richardson's treatise on painting, essentially a book about aesthetics.⁴ Perhaps to entice customers, Le Blon also wrote a book about his picture-printing technique; this appeared in 1725.⁵ Sometime before that, however, Le Blon began to experiment with a technique to weave tapestries. There was a patent for this invention too, and it received the favorable notice of several influential persons.⁶ Among them were Cromwell Mortimer, secretary of the Royal Society of London, and Sir Richard Manningham, who gave Le Blon space to work at the Mulberry Grounds in Chelsea and proposed him for membership in the Spalding Gentlemen's Society.⁷

The looms were set, and some drawings, characterized by Walpole as "very fine," were made but Society did not respond to this endeavour. Le Blon had been concerned in a "picture company" some years previously, where his conduct did not inspire public confidence. Moreover, the taste for tapestry decoration had died out . . .

Alfred Beaver, *Memorials of Old Chelsea*: (London, 1892), 144.

Le Blon's tapestry manufacture was even less successful than the manufacture of color printed pictures had been. When this second business failed in the mid-1730s, he removed himself to Paris and returned to the business of color prints. By 1738, Le Blon had received a French privilège much like his initial British patent to make and sell color-printed pictures.⁸ Again, he found students and backers, and he opened a workshop.

Le Blon's printing invention was moderately successful in France but still not profitable or, apparently, well managed. His death in 1741 left a few loyal advocates (notably Henri-Louis Duhamel de Monceau and his financial backer Antoine Gautier de Montdorge), several students, a very young daughter, and a struggle over the right to be called the inventor of color printing.

Le Blon avoit une maniere plus prompte d'opérer, par le moyen d'une quatrième planche en noir, qui dans l'ordre de la gravure & de l'impression passoit la première fois la presse. . . . Malgré les avantages que cette quatrième planche semble présenter pour l'expression des ombres, l'inventeur ne s'en servoit que malgré lui, parce qu'elle étoit contraire à son système favori des trois couleurs primitives.

"Des Tableaux Imprimés" *Journal œconomique* (November 1756), 173.

The *Journal œconomique* described the 1756 republication of *Coloritto* (*L'Art d'imprimer les tableaux*, edited by Gautier de Montdorge) as part of an attempt to revive Le Blon's processes, but no such revival happened.⁹ One reason may be that a former student, Jacques-Fabien Gautier d'Agoty had claimed Le Blon's privilège and his title of inventor. Gautier d'Agoty argued—in many public venues and consistently for many years—that Le Blon's technique was not true color printing. As a result, details of Le Blon's technique are discussed in the minutiae of Gautier's grievances, taken to the *Mercure de France*, argued against there and in the *Journal œconomique*, and presented in Gautier's own periodical publications and his pamphlets. The *Coloritto* and *L'Art d'imprimer les tableaux* are principal, but not the sole, sources for information about Le Blon's work.

One of Gautier d'Agoty's claims against Le Blon's designation as the inventor of color printed pictures was the quantity of hand-finishing Le Blon employed: so much that they were not truly pictures printed in color. Yet Gautier d'Agoty also suggested that Le Blon had used more plates—sometimes as many as seven—than the three Le Blon claimed he did. As part of the response to this charge, in an article in the *Journal œconomique*, it was noted that Le Blon might add a fourth, black plate to speed up the process. Generally he preferred to avoid this, however, as it was contrary to the basis of his system.¹⁰

Unlike this posthumous rival, who used color prints in journals and popular publications about art, natural history, and medicine, Le Blon had as his principal interest the reproduction of fine-art paintings, especially portraits. Despite the involvement of a designer (Madeline Basseporte) affiliated with the Jardin du Roi, he created only a few of the anatomical or natural-history drawings for which replicable color was an acknowledged need. This failure of this business may have been owing to a miscalculation of the market or of interest in the subject matter as much as to any technical difficulties or commercial mismanagement.

Le Blon's Printed Pictures

A fine Print, coloured by a Judicious Artist, might be made almost equal in Value to an original Drawing in Colours: But for such no one will pay a price equal to its worth.

George Edwards, *A Natural History of Birds* (London, 1751), 4:216.

How can we understand Le Blon's efforts and his achievements, however qualified they might be? Interpretative possibilities place them within the history of art consumption as well as the history of its technologies: Le Blon's imitation paintings are a part of a long tradition of art reproduction for broadcast and sale. Yet much of the history of that tradition in the eighteenth century is only indirectly relevant. Its focus is the reverential attitude toward the ancient world and eighteenth-century interpretations of archaeology, rather than the

reproduction techniques that brought classical statuary into northern European homes.¹¹ Attempts to create objects that were as good as those of the ancient world or that imitated but improved on them were consistent throughout the eighteenth century, just as those objects and their originals served as sources of inspiration and innovation. Le Blon's three-color printing method did not exploit interpretations of the classical world in the way that techniques such as encaustic painting did.

We shall content ourselves with observing, that those persons who wish to apply to Painting, should not only copy Drawings of good Masters, but also the antique figures.

Constant de Massoul, *A Treatise on the Art of Painting* (London, 1797), 17.

Other historians have described the proliferation of reproductive prints in the eighteenth century and the place these items hold in a society oriented toward goods and luxury objects.¹² Making copies of masterworks was also a form of instruction, and academic-based instruction from at least the seventeenth century sanctioned and encouraged this practice.¹³ Le Blon's work did not reclaim old worlds of art but rather identified new ones. It was therefore not part of that academic tradition. In order to understand Le Blon's work, we need to expand our interest in eighteenth-century approaches to consumption.

Imitation Paintings

The growing demand for reproductions in the eighteenth century led, not surprisingly, to interest in techniques that increased the resemblance between an original oil painting and its imitations while limiting the cost. Any one of several techniques might be used, but none guaranteed an exact reproduction. A copy made by hand from the original, in oils or another medium, was one alternative. The attractiveness of the result—and its cost—varied according to the skill of the copyist and his or her access to the original, however, and this method could be as time-consuming as creating an original. Engraving would allow a greater number of people to see (or collect) famous or popular pictures, as many copies could be easily made. Furthermore, the process did not require the presence of the original artist—or any painter, for that matter. Mezzotint techniques—a specialty of Le Blon—were especially appropriate for reproductions, as they offered subtleties of shading and texture that gave the image a depth not found in woodblocks or in other copperplate printing techniques.¹⁴

The limited range of color was a problem of all reproduction techniques, however. While a print could be made using a colored ink or a colored paper, in either case the color range was restricted. A copy could be hand-colored after printing, but these steps increased both cost and production time—although not to the degree that recreating the original in oil might have. As a mimetic device, even mezzotint engraving still had much room for improvement.

Le Blon was not the first to think of or experiment with color printing: Abraham Bosse and Johannes Teyler both described techniques in the seventeenth century, and Gautier d'Agoty suggested that Pieter Pietersz Lastman had experimented as well.¹⁵ Le Blon's invention did create pictures that seemed to combine the best features of the hand-painted copy, especially the use of color, with the best features of engraving—particularly the quality of the image and consistent reproduction. Le Blon's system rested on the separation of a composition into its red, yellow, and blue components and on the creation of an engraved plate for each. The three plates were applied sequentially to a sheet of paper. The result, when the inks were good and the plates aligned accurately, was an imitation oil painting as well as a new kind of art. It was in colors, like the original. More than one copy could be made from the set of plates, and each copy would be nearly identical to every other one. Varnished and framed, a color printed picture might seem to be an oil copy, if not an original.

If three-color printing was good enough as a technique of reproduction, in some respects it was only barely so. The choice of coloring materials was as critical here as it was in creating any other kind of color diagram: Le Blon recommended the use of a red lake made from cochineal or brazilwood, Prussian blue, and yellow berries (stil de grain), but the quality of the coloring materials was as important as their sources.¹⁶ Black was made by combining the three colors and the paper support provided white.

There were other problems in Le Blon's system, including some inherent in the size of the color printed pictures. Le Blon's preference for the reproduction of paintings demanded both a press that could print evenly on very large papers and the resources to obtain the correspondingly large (and expensive) copper plates for the engraving. Early examples also required considerable hand finishing. While it could be said that color mezzotint engraving was less time-consuming than creating individual reproductions, the technique shifted the skills required to produce copies of paintings from the skills of a painter to those of printers. This shift formed part of Gautier d'Agoty's argument against the work of his many rivals, including Le Blon: his experience in textile printing, Gautier d'Agoty believed, meant he better understood the skills needed, and the methods involved.¹⁷

Le Blon's Tapestries

[Le Blon] proposes to weave the Cartons of Raphael as large as the life for a hundred guineas, that cannot be so done by the usual way of tapestry making in ten times the price or ten times the Time.

George Vertue's Notebook (British Library, Add. Ms. 23,076) quoted in *The Twenty-Second Volume of the Walpole Society 1933–34* 22 (1934): 32.

Did Le Blon begin to experiment with weaving while the Picture Office still

functioned, or was it an undertaking that began only after the demise of the color-printed picture business? It is unclear. H. C. Marillier has suggested Le Blon was already working at the Mulberry Grounds in 1723, four years before the second patent.¹⁸ It is also difficult to know what led him to this venture, although his interest in and experimentation with tapestry-making did not require the conceptual leaps away from his other concerns that they might, at first, seem to suggest. Tapestry, meaning a large pictorial image created to decorate a wall, rather than the production technique often used to make such hangings, is the woven object that most closely resembles paintings in both purpose and cultural value among European decorative and fine arts. Like paintings, tapestries are expensive and time-consuming to produce. Both are luxury items not necessary to life the way a coat of paint on a door or articles of clothing might be. It is possible that the same reasons—including reasons of personal economics—that inspired Le Blon's interest in printing pictures from three colored plates led him to create decorative wall hangings that imitated tapestry. If so, it is not surprising that, similar to the case of his color-printed pictures, the only extant examples of his technique are taken from a well-known work, and one with special significance in England. Le Blon chose to replicate the head of Christ, an image taken from a tapestry cartoon designed by Raphael. The cartoon series was in the picture collection of the King of England and at the time the only example of Raphael's work outside Italy.¹⁹

Imitation Tapestry

. . . any common *Draft-Weaver*, tho' not acquainted with *Drawing* nor *Painting* . . . exactly produceth what the *Painter* hath represented in the original *Pattern*: And thus a *Piece of Tapestry* may be woven in a Month or two, which, in the common Way of working, would take up several years: and what in the common Way costs a thousand Pounds may, by this means, be afforded finer and better for a hundred pounds.

Cromwell Mortimer, *Le Blon's Principles of Printing and Weaving* (London, 1731), 5–6.

Cromwell Mortimer's report to the Royal Society of London is the most significant contemporary publication concerning Le Blon's weaving endeavor and its techniques.²⁰ Mortimer's article enumerated the differences between Le Blon's invention and traditional (French) tapestry making, emphasizing the former's ability to produce tapestry or tapestry-like objects more quickly and at a lower cost. The savings came from several different sources. First, there was no need to employ a painter or artist at the weaver's atelier. In this new technique, a patternmaker could lay a grid over any image and use this to guide loom setup. The weaving was completed more quickly than traditional tapestry weaving; in months rather than years. The result would cost as little as a few hundred pounds, rather than several thousand. Although still out of reach of most of the public, those who could afford Le Blon's imitation tapestry would be able to hang a finer and better piece on their wall for less money. This in turn would encourage "many thousand industrious Families" to take up tapestry weaving.²¹ Like color-printed pictures, it would become the foundation of an important industry.

Modern assessments of Le Blon's imitation tapestries suggest an interesting but hardly innovative weaving technique.²² The process is not related to traditional tapestry-weaving methods, which call for discontinuous shaped areas of colored wefts to create the image. Le Blon freely admitted that his invention was a variation on brocade weaving; it involved use of a drawloom to create the image. In brocade weaving, extra yarns are added to the cloth and passed to the front or back of the basic structure, as the design requires. The creation of a decorated cloth is more rapid than in "true" tapestry techniques, and several identical or mirror-image works can be made from a single loom setup. The most time-consuming and meticulous stage was the loom preparation—a skilled task but still a less demanding one than tapestry weaving.

There is one serious problem with pictorial weavings made in this way however. The extra colored yarns, which "float" across the reverse, displace and distort the woven image. This creates an uneven surface and an extremely bulky object. The visual result of this technical problem, as much as the size limitations imposed by the drawloom and the same inadequate financing and lack of consumer demand that appear to have doomed The Picture Office, may be reasons Le Blon's imitation tapestries were even less successful than his imitation paintings. Still, Le Blon's weaving was not completely unknown: As late as 1760 the Society of Arts rejected an imitation tapestry technique because of its similarities to Le Blon's work.²³ Le Blon's tapestry-weaving project, while not completely obscure today, receives only brief mentions in catalogs of false-tapestry techniques. For these reasons, and because of traditional divisions between the fine and decorative arts, connections between Le Blon's weaving invention and his three-color printing techniques have never been well explored. Their interrelationships with Le Blon's statements about the role of scientific ideas in his work make them worthy of closer examination.

The Science in Le Blon's Art

While searching for the general rules for that part of painting which the painters call the effect of mixing colors and to reduce it to mechanical practice, which is solid, sure and easy I discovered that my plans would be practicable if I could find the perfect primitive colors under the artists paints. When I finally had found them so close to the primitive colors that I could not miss any of the intermediate colors by mixing them, I began to discover that in following these principles, painting could represent all visible objects perfectly and easily, not only by means of the painters brush but also by printing. The idea of the possibility of printing with harmoniously arranged colors occupied my thoughts to such an extent, that I could not stop brooding seriously over it.

Jacob Christoph Le Blon, Description of his method of printing pictures, British Library, Add Ms. 4299 f. 75r-v.

Le Blon's technique of color printing, as described in his book *Coloritto*, was the outcome of a search for the mechanical practice of painting. The invention demonstrated that there was an inherent order to art, as there was in nature, and that furthermore the two were closely connected. Proof of the validity of these

precepts came through the concept of trichromacy. Artists knew that combinations of red, yellow, and blue plus black and white would make all other colors. In Le Blon's system, white was supplied by the paper and, as trichromatic theories indicated, overlaying of all three inks would create black. As part of the search for a greater order, determination of the proper materials for these three colors was essential. They must be able to combine to create shades in proportion to the quantity of coloring particles used.

... when small Particles of different Colours are placed close together, if they are so small that each of them cannot be seen separately by the Eye, we do not discern the Colour of each particular Atom.

Cromwell Mortimer, *Le Blon's Principles of Printing and Weaving* (London, 1731), 1–2

Le Blon—and others—credited scientific philosophies as a driving force behind his inventions. Newton's observations on mixing two different-colored powders were probably critical to Le Blon's understanding of his own color printing technique.²⁴ The combination of two primary colors—Newton used dry blue and yellow pigments—creates a new, compound color (green), but microscopic examination shows that the original particles remain. Small bodies associate to make a new color. For Le Blon, Newton's description affirmed practical understanding of color mixing and trichromacy. Two colors might be combined to create a third, but the third color will exhibit characteristics of the original components rather than those of a visually similar color produced from a single material or different combination of substances. Green resulting from the combination of *stil de grain* and indigo would have the combined qualities of those materials, for example, rather than of verdigris or Prussian green. Le Blon used this confluence of technique and understanding as a guidepost for improved accuracy of picture reproductions. Furthermore, in discovering this order Le Blon believed he had met the challenge of connecting science to industry. Production of imitation paintings increased. A new industry was created.

By the same Principles of producing any visible Object with a small Number of Colours, [Le Blon] arrived at the skill of producing in the *Loom* all that the *Art of Painting* requires. . . . And, 'tis probably, many Improvements may from hence be made in several Trades, especially in combing of Wool, where the mixing of several Colours may be of great Use; but he hath not yet had Time to apply it to anything else besides Painting, Printing, and Weaving.

Cromwell Mortimer, *Le Blon's Principles of Printing and Weaving* (London, 1731), 5.

Le Blon's printing invention also incorporated technical information familiar to him as an engraver and miniaturist. A feature of mezzotint engraving is that its details depend on series of dots or small marks. The size, shape, and placement of these dots create the shading and depth of tone that made mezzotints distinctive from and, in some senses, better than other engraved pictures. Miniature-painting can also rely on series of small dots to articulate considerable detail in a relatively small space, and here the points or particles may be different colors. Again, shading can be achieved by variations in the size and placement of dots and by

variations of the color combinations employed. Le Blon claimed that the sources for his inspiration and study were a combination of ideas common in natural philosophy and the artisan worlds. He used specific painting and engraving techniques to prepare three plates according to doctrines of trichromacy that were proved by Newton and supported more generally by mechanical philosophy. The result was an achievement that was at once aesthetic, artistic, and scientific.

Cromwell Mortimer in his report to the Royal Society mentioned Le Blon's assertion that the same philosophical ideas that inspired his printing methods also drove the weaving invention. Did he hope to solidify a philosophical reputation by showing that the "infallible Rules" of harmonious color for painting were equally valid in all practices? Again, the answer is unclear. Mortimer described Le Blon's tapestries as using the same three colors of the color-printed pictures plus white and black. Other contemporaries attest to Le Blon's belief in a scientific connection to artisan practice, and testimony of Charles-François Dufay suggests the depth and range of Le Blon's influence in this subject. Le Blon is credited with having convinced Dufay of the value of trichromatic theories to dyeing.²⁵

The problem with suggesting a single scientific foundation for these two techniques is immediately obvious when the tapestries are examined. It is clear that despite Mortimer's assertions Le Blon did not limit himself to red, yellow, blue, black, and white, or even the red, yellow, blue, black, and fawn colors recommended by most dyers. The head of Christ includes green and russet-colored wool yarns as well as blue, yellow, and red ones.

As a manifestation of Le Blon's beliefs in the combination of the sciences and the arts, the weaving project is more speculative than the color printed picture project. One answer to the differences between what Le Blon (or Le Blon through Mortimer) wrote and what we see comes from understanding the weaving technique he employed. The drawloom mechanism that Le Blon used to make his tapestries could accommodate a large number of extra wefts, the yarns that created the pattern. A new color at each warp crossing might be tedious to execute, but it would not be impossible. Although it cannot be corroborated, I suggest that Le Blon initially used only five colors to weave his tapestries, as he stated. These colored yarns could have passed between the front and back of the weaving, perhaps over each warp, offering a suggestion of individual points of color within a continuous line. The design, then, would depend on the juxtaposition of pure-colored dots, just as Newton's dry pigments showed, and as Dufay's experiments would later confirm. Le Blon's woven-picture industry would call on the same principles as did his picture-printing—blending primary colors—and give to tapestry the notion of color-mixing that was prominent in the idea of trichromacy. This technique would avoid the need for large numbers of different-colored yarns that gave tapestries their painterly effect but that raised costs and created quality problems.

But there are two problems here. Reading a macroscopic combination of colors, such as these tapestries, would not lend itself to the visual blending assumed to take place in the microscopic world. Just as Le Blon found he needed to add a fourth (black) plate to his three-color printing, it would have been obvious that production time could be reduced if, for example, the weaver used green-dyed yarns directly, rather than relying on a visual mixture of yellows and blues. The result would also be more attractive at close range—a consideration for tapestry weaving that may not have been immediately obvious from printing or dyeing analogies.

Jacob Christoph Le Blon's inventions raise many questions about production and intentions. They were not financial successes in his time, and they are obscure now. Nevertheless, Le Blon's inventions are examples of the range of sources, practical as well as philosophical or scientific, that were called into the effort to improve color-related manufactures. Le Blon's work was a model of trust in connections between philosophical knowledge and industry practices, his endeavors are significant for the assumptions they express about the use of science in the industrialization of artisan practices. Extant examples of Le Blon's work, together with his writing about that work, show that he was inspired by scientific ideas to develop concepts that were in turn connected to other artist practices. Creating this connection was a production goal and a selling point for scientists, artisans, and consumers.

Notes:

Note 1: Ad Stijnman, "Jacob Christoph Le Blon," *Grove Art Online*, (Oxford University Press, accessed 15 November 2004), at www.groveart.com; Otto M. Lilien, *Jacob Christoph Le Blon, Inventor of Three and Four Color Printing* (Stuttgart, 1985); Hans W. Singer, "Jacob Christoffel Le Blon and His Three-Colour Prints," *The Studio* (1903): 261–69.

Note 2: Richard Godfrey, *Printmaking in Britain*, quoted in Gavin Bridson and Geoffrey Wakeman, *Printmaking and Picture Painting, A Bibliographic Guide to Artistic and Industrial Techniques in Britain 1750–1900* (Kidlington, Oxford, England, 1984), 7.

Note 3: "A New Method of Multiplying of Pictures and Draughts by a Natural Colleris with Impression," English Patent no. 423 issued to James Christopher Le Blon (5 February 1719).

Note 4: Lambert Hermanson ten Kate, *The Beau Ideal, By the Late Ingenious and Learned Hollander, Lambert Hermanson ten Kate*, trans. J. C. Le Blon (London, 1732).

Note 5: Jacob Christoph Le Blon, *Coloritto, or the Harmony of Coloring in Painting: Reduced to Mechanical Practice Under Easy Precepts and Infallible Rules, Together with Some Colour'd Figures in Order to Render the Said Precepts and Rules Intelligible Not Only to Painters But Even to All Lovers of Painting* (London, [1725]).

Note 6: "The Art of Weaving Tapestry in the Loom, . . . which, for its Beauty, Durability and Cheapness Far Excels any Tapestry Ever Yet Made . . .," English Patent no. 492 issued to James Christopher Le Blon (1 May 1727).

Note 7: Spalding Gentlemen's Society Minutes for 9 August 1733, in *The Minute-books of the Spalding Gentlemen's Society 1712–1755*, eds. Dorothy M. Owen and S. W. Woodward (Lincoln, Lincs., England, 1981), 28.

Note 8: *Arret du conseil* (November 1737, renewed 1 April 1738). See also "Portrait du Roi et Notes Relative à l'Histoire de Gravure en Couleurs," *Mercure de France* No. 869 (September 1739, vol. 2): 2214–45.

Note 9: "Extraits des Livres, Journaux et Lettres d'Angleterre (Des Tableaux Imprimés)," *Journal œconomique* (November 1756): 162–75.

Note 10: "Extraits des Livres," 173.

Note 11: Martin Myrone and Lucy Peltz, eds., *Producing the Past: Aspects of Antiquarian Culture and Practice 1700–1850*, (Aldershot, Hants., England, 1999); David Ormrod, "The Origins of the London Art Market, 1660–1730," in *Art Markets in Europe 1400–1800*, eds. Michael North and David Ormrod (Aldershot, Hants., England, 1998), 167–86.

Note 12: Susan Lambert, *The Image Multiplied* (London, 1987); Florian Rodari, ed., *Anatomie de la couleur: L'invention de l'estampe en couleurs* (Paris, 1997).

Note 13: Anne Puetz, "Design Instruction for Artisans in Eighteenth Century Britain," *Journal of Design History* 12, no. 3 (1999): 217–39.

Note 14: Florian Rodari, "Le Vrai et le Beau," in *Anatomie de la couleur: L'invention de l'estampe en couleurs*, ed. Florian Rodari (Paris, 1997), 13.

Note 15: Jacques-Fabien Gautier, "Lettre de Gautier à M.de Boze . . . sur la Gravure des Couleurs," *Mercure de France*, no. 909 (July 1742): 158–72, and printed separately (without the color plate) as *Lettres concernant le nouvel art de graver et d'imprimer les tableaux . . .* (Paris, 1749).

Note 16: Antoine Gautier de Montdorge, *L'Art d'imprimer les tableaux traité d'après les écrits, les opérations et les instructions verbales, de J.C. Le Blon* (Paris, 1756), 115–16. See also *Anatomie de la couleur* and Otto M. Lilien, *Jacob Christoph Le Blon 1667–1741: Inventor of Three and Four Colour Printing* (Stuttgart, 1985).

Note 17: Gautier, "Lettre à M. Boze."

Note 18: H. C. Marillier, *English Tapestries of the Eighteenth Century* (London, 1930), 98–100.

Note 19: For insight into the symbolism of Le Blon's choice see Arline Meyer, *Apostles in England: Sir James Thornhill and the Legacy of Raphael's Tapestry Cartoons* (New York, 1996).

Note 20: Cromwell Mortimer, *An Account of Mr. James-Christopher Le Blon's Principles of Printing, in Imitation of Painting, and of Weaving Tapestry, in the Same Manner as Brocades* (London, 1731), 5. Mortimer's pamphlet is identical to his article, read at the Royal Society of London and published in the *Philosophical Transactions* 37 (1731–32): 101–7.

Note 21: Mortimer, *Le Blon's Principles of Printing and Weaving*, 5.

Note 22: Wendy Hefford, personal communication, 24 June 1999.

Note 23: Committee Minutes of the Manufactures Committee, 25 August 1760, [R]SA Minutes of Varous Premium Committees 1760–61, PR.GE/112/12/2.

Note 24: Isaac Newton, "Optica, Part II, Lecture 5," in *The Optical Papers of Isaac Newton*. vol. 1, *The Optical Lectures 1670–1672*, ed. Alan E. Shapiro (Cambridge, 1984), 472–73.

Note 25: Cited in Florian Rodari, "Jacob Christoph le Blon, L'Œil Trichrome," *Anatomie de*

la couleur: L'invention de l'estampe en couleurs, ed. Florian Rodari (Paris, 1997), 61.
