

Artists and Colormen

August-Ludewig Pfannenschmid

Color Communication, Mayer Variants

August-Ludewig Pfannenschmid was a colorman who worked in or near Hanover in the later eighteenth century. As the result of his own reading and interests (both theoretical and commercial), Pfannenschmid invented a variation on Tobias Mayer's triangle for the use of his clientele. Apparently too busy to transcribe his theories, it is owing to a collaborator, Ernest Rudolph Schulz, that Pfannenschmid's *Versuch einer Anleitung zum Mischen aller Farben aus Blau, Gelb und Roth nach beiliegendem Triangel* was published in 1781 and again in 1789. A French translation was issued twice before the end of the eighteenth century.¹

In an introduction to the French edition of 1788, Schulz noted that Pfannenschmid had already published a work about the composition of twelve kinds of different colors; it may have been an earlier version of this work or possibly a pamphlet that is now lost. Schulz emphasized his expectation that Pfannenschmid's work would be useful to people involved in design and painting—notably, but not exclusively, practical people. A feature of the triangle Pfannenschmid developed, one that Schulz claimed made it different from Mayer's and Johann Heinrich Lambert's color triangles, was that it emphasized practical applications for painting above either general consumer or philosophical concerns. Lambert's *Beschreibung . . . einer Farbenpyramide* (1771), although a main source of inspiration for Pfannenschmid, was useless for those constituencies; it was too concise and too full of scientific terms to be intelligible. Mayer's work, which Pfannenschmid knew because of Lambert, was even more obscure in its description and its use of Latin. (Apparently Pfannenschmid did not know of the *Göttingische Anzeigen* report.)²

Pfannenschmid included in his book a chart of his own devising, a visible outcome of his ideas, and one with practical advantages. Pfannenschmid acknowledged that the information in his book was not new, but rather an attempt to expand on an existing theory and to correct its errors. This understanding would give those who love painting an opportunity to perfect the theory of their art. Pfannenschmid's book is similar in this rationale to other efforts—notably John Hoofnail's *Painter's Companion*—to bring information generated by natural philosophers or mathematicians to practical venues.

Pfannenschmid's Presentation

Je n'ai point lu d'autres écrits qui traitent du mélange des couleurs; tels que ceux de *Lionardo da-vinci* de le *Blond*, de *Schiffermuller* & de *Castell* qui cite M. *Lambert*. J'ignore également si quelqu'un de ceux dont j'ai fait mention ci-devant, auroit composé quelque autre ouvrage sur le

même sujet.

August Louis Pfannenschmidt, *Essai sur la maniere de mélanger et composer toutes les couleurs* (Lausanne, 1788), 14.

Pfannenschmidt believed that the knowledge he presented is important because of the infinite number of colors. So great a variety makes the imitation of nature difficult. In addition, Pfannenschmidt claimed, color nomenclature guarantees nothing. The color orange provided by different colormen, or even the orange produced by one firm at different times, may be very different colors. As Schäffer had mentioned, the use of the same colors on every example of a chart was critical to its value as a tool for description or comparison tool. Without a chart, however, it was even more difficult to transmit information about color choices. Better knowledge of colors, and a more stable means of identification, would make choices easier.

Ordinairement . . . on exclu le noir du nombre des vraies couleurs, & on se contente de l'appeller une privation totale de la lumiere. Qu'on nous permette d'exposer ici notre sentiment à cet égard.

La suite de ce que nous allons dire prouvera, que le noir n'est point une couleur simple, mais une couleur composée, de même que le verd, le violet & le brun; & que c'est donc bien à tort qu'on envisage le noire comme une nullité. C'est pourquoi tous les peintres ont rand raison de ne point se priver de la couleur noire, & de lui destiner, comme aux autres, un vase particulier.

August Louis Pfannenschmidt, *Essai sur la maniere de mélanger et composer toutes les couleurs* (Lausanne, 1788), 28–9.

Pfannenschmidt's presentation began with a proof for the primitive, or pure, colors. He started with an explanation of the prismatic colors. Because colors in the rainbow are not physically separated, some of the colors it contains must be mixed. A mixed color cannot be a primitive color. His explanation continued, systematically identifying the components of each mixed color in the prism and reducing all to red, yellow, and blue. These, Pfannenschmidt concluded, are the primitive colors. Together they will make black. He does assure his reader that, although black is usually understood to be privation of light, and so excluded from lists of colors, in this situation it is a composed color. This is why painters have good reason to give it a place on their palette and why it is wrong to think of black as a nullity. This same explanation of the philosophical grounding for painting practice is found in all kinds of manuals—a reassurance of the validity of a collaboration between artisan endeavors and scientific ideas even when those ideas diverge.

Working from the three primitives, Pfannenschmidt describes 18 mixtures of two colors and 46 mixtures of all three, numbers he believed were more true to nature than Lambert's 24 and 21 respectively. Because of the different numbers—fewer pairs but more triads—his table had a physical arrangement different from that of either Lambert's or Mayer's. In Lichtenberg's drawing of Mayer's triangle, and in others, the color chambers are compacted so that they

touch, suggesting that a visual and physical boundary between any two adjacent colors exists, and supporting Mayer's study of the limits of color vision. Pfannenschmid's circles appear as highlights of the larger triangular color space. As with Lambert's model, this hints that there are more colors in the world than can be demonstrated in a single image; Pfannenschmid's choices are the most important or the most useful ones. In support of that concept, too, Pfannenschmid claims eighteen parts (rather than Mayer's twelve) to the composition of each color.

Cette figure, ainsi que la méthode que nous avons adoptée dans l'arrangement des cases, ont encore l'avantage d'offrir le mieux, & pour ainsi dire, sous un même coup d'œil les différents degrés de nuances dans les couleurs.

August Louis Pfannenschmid, *Essai sur la maniere de mélanger et composer toutes les couleurs* (Lausanne, 1788), 47.

Pfannenschmid—again, like Mayer, Lambert, and Moses Harris and also like Jacob Christoph Le Blon—describes his own study of appropriately pure primitive colors. Which of the many choices should they be? The technique to identify the most-pure colors suggests a philosophical position, Pfannenschmid claimed. It comes from the idea that a perfect mixture is two colors mixed in such proportion that the eye cannot see any shade of one or the other. Rejecting the choice of cinnabar and mountain blue, both recommended by Lambert and Mayer, because they are not pure enough, Pfannenschmid chose carmine, gamboge, and ultramarine as the sources for the true primitive colors.

Pfannenschmid concentrates on the twelve colors he named as essential, the subject of his earlier publication. They are the three primitives (red, yellow, and blue), the three intermediate or secondaries (green, "fire-color," and violet), four lateral colors (a black or brownish-blue, brown-yellow, brown-red, and brown), and black and white. With the exception of white, all these colors, which together he calls the generic colors, can be found in his triangle.

Pfannenschmid's Color Triangle

A large portion of Pfannenschmid's book is taken up with calculations necessary to recreate his color triangle. The chart included in his book is not colored in, but appropriate proportions of each of the primitive colors are noted inside every circle. He instructs the reader in color mixing; his advice is similar to that of Mayer. An artist or artisan could complete the table and have a chart to identify and compare all colors. For those who were uninterested in the tedium of mixing each color, Pfannenschmid noted that, in addition to the three primitives, he could supply a set of the twelve intermediates, or all sixty-four colors.

Pfannenschmid's Color Algebra

Line C-20 contains:

Circle#	Yellow	Blue	Red
6	6	12	0
5	4	13	1
4	2	14	2
63	0	15	3

Source: August Louis Pfannenschmidt, *Essai sur la maniere de mélanger et composer toutes les couleurs* (Lausanne, 1788).

Pfannenschmid employs several different number systems within his project to chart colors; each system works with the others. He provides a basic order, for example, by numbering each circle in the triangle: this is to simplify identification. (Blue is at the top axis of the triangle, yellow at the left, and red at the right.) A second system indicates the proportions of pure color to be mixed for each circle. A third set of numbers relate to series of dashed lines that, drawn through adjacent circles, aid those unfamiliar with mathematics in copying the model triangle onto a separate piece of paper, in whatever size desired. As a further aid, the triangle includes lines that indicate a mathematical relationship among the colors along it. So, for example, the line described as C-20 extends through circles numbered 6, 5, 4, and 63. The addition of the proportional quantities of circle number 6 to circle number 63 will yield the same totals (6, 27, 3) as the sum of proportions of circles 5 and 4. This suggests, then, that to create the color indicated by (6 yellow + 27 blue + 3 red), one could combine either pair, colors 6 and 63, or 5 and 4. This allows Pfannenschmid to acknowledge colors that do not appear in his triangle rather than dismissing them as inconsequential, as Mayer did.

Pfannenschmid also gives the necessary details to use his triangle to compose or identify colors. His technique is similar to that of Mayer and Lambert: He chooses colors and adds or subtracts the proportions of the combinations to find the color wanted. He describes this application as one useful to painters and dyers, especially beginners and apprentices, as it will allow them to develop their skills combining colors.

As a final note to the construction of this triangle, Pfannenschmid offers a method for adhering the engraved plate provided in the book—once it has been colored-in—to glass, a popular decorative activity.³ The amateurs and beginners in painting who were Pfannenschmid's audience may have been familiar with that technique through other literature, including general compilations of household information and more specific treatises such as Johann Melichor Crocker's *Der wohl anführende Mahler* and Robert Dossie's *Handmaid to the Arts*.⁴ The protection of glass would have made the completed color triangle suitable for

display in the home or studio, but this was also a preservation technique, one that would guard the painted surfaces from damage during use.

Making the Mathematical More Practical?

Pfannenschmid's book reworks presentations about color and color display from mathematical philosophers, without offering significant improvement or even much change. His discussion adds depth to our understanding of the value of classification, or ordering systems, and to our recognition of the continued problems in their construction and use. The unpredictable aspects of color creation made it difficult to achieve a standard among any color display form; the only realistic method may have been Pfannenschmid's suggestion to purchase all colors from one supplier. It is also clear from Pfannenschmid's comments (as it is from our knowledge of the history of other color classification charts) that, despite claims and continuing efforts at improvement, no eighteenth-century ordering system was widely adopted by the practical communities that they were supposed to serve. At the same time, the need for such a tool—for trade as well as for the arts—was always apparent. The audience Pfannenschmid claims is not first the philosophers whom Mayer and Lambert but rather practical people—or those hoping to become so. Pfannenschmid reaches for his audience from approximately the same position as Constant de Massoul, Thomas Bardwell, William Williams, and perhaps even Pierre-Henri Taunay.⁵ They are tradesmen who find that information more regularly associated with philosophers is valuable in the practices that those philosophers connect to it. This is apparent in Pfannenschmid's explicit statements and in the construction technique he devised for his triangle. His book was keyed to his practice, but Pfannenschmid's universalization, and his use of mathematics especially, connects him into all the contemporary worlds of color in ways that many others' books do not.

Notes:

Note 1: August Louis Pfannenschmidt [*sic*], *Essai sur la manière de mélanger et composer toutes les couleurs au moyen du bleu, du jaune et du rouge, et d'après le triangle annexé à cet ouvrage, rédigé et publié par Ernest Rodolphe Schulz, Pasteur de l'église de Ronnenberg, près de Hannover* (Lausanne, 1788). The German version, Ernest Rodolphe Schulz's *August Ludewig Pfannenschmid's Versuch einer Anleitung zum Mischen aller Farben aus Blau, Gelb und Roth nach beiliegendem Triangel*, was printed in Hannover (1781) and Leipzig (1799). I am grateful to Rolf Kuehni for this bibliographic information.

Note 2: Tobias Mayer, "Von Meßung der Farben," *Göttingische Anzeigen* 2, no. 147 (1758): 1385–59.

Note 3: Ann Massing, "From Print to Painting: The Technique of Glass Transfer Painting," *Print Quarterly* 6, no. 4 (December 1989): 383–93.

Note 4: Johann Melchior Cröker, *Der wohl anführende Mahler: welcher curiöse Liebhaber lehret, wie man sich zur Mahlerey zubereiten, mit Oel-Farben umgehen, Gründe, Fürtüsse*

und andere darzu nöthige Sachen verfertigen, die Gemählde geschickt auszieren, vergülden, versilbern, accurat lacquiren, und saubere Kupffer-Stiche ausarbeiten solle (Jena, 1753); Robert Dossie, *Handmaid to the Arts*, 2d ed., 2 vols. (London, 1764) and *Praktisches handbuch für Künstler*, 3 vols., trans. J. G. Geissler, (Dresden: 1792–93).

Note 5: Thomas Bardwell, *The Practice of Painting and Perspective Made Easy: In Which is Contained, the Art of Painting in Oil, . . . and a New, Short, and Familiar Account of the Art of Perspective* (London, 1756); Constant de Massoul, *A Treatise on the Art of Painting, and the Composition of Colour, Containing Instructions for All the Various Processes of Painting; Together with Observations upon the Qualities and Ingredients of Colours. Translated from the French of M. Constant de Massoul* (London, 1797); [Pierre-Henri] Taunay, "Mémoire sur la Peinture en Email," *Observations sur l'histoire naturelle sur la physique et sur la peinture* (1756): 172–91; William Williams, *An Essay on the Mechanic of Oil Colours* (Bath, 1787).
