

Techniques and Innovations

Saxon Blue and Saxon Green

Early in the year 1749, Jean Leonard Roederer (or Koederer), a dyer in Strasbourg, sent several lengths of blue and green wool to Paris.¹ He attached to them some provocative claims; The cloth looked similar to the Saxon blue and Saxon green cloths then so popular in Leipzig, but it improved on them. After long work, and with much outlay, Roederer had found a secret to protect these dyed fabrics. Unlike other dyed wools, when ink or oil was spilled on cloths dyed with his *vert de Strasbourg*, the stains could be easily removed, using only fresh water. Roederer hoped that the cloth he sent would be made into hunting costumes for the king and the dauphin. He also hoped to receive an award for this discovery. His preferred compensation was typical of such requests: recognition as dyer to the king, an exclusive privilège to dye wool cloth and stuffs using his new process, a special lead mark for his product, and an exemption from having to lodge troops in his household.²

According to protocol, the fabrics went to Jean Hellot, chemist at the Paris Academy of Sciences, for tests of their quality and their qualities. He subjected samples of both colors to the common tests for washing and fading. Hellot's examination proved that the cloths did not meet the claims of their inventor—the ink stains he applied remained in the cloth. But neither did Roederer's dyed fabrics respond to traditional testing procedures in typical ways. Sample cuttings boiled in soap lost all color. Boiling the samples in alum made the blue color disappear, leaving behind only the yellow of the original green sample.³

Given his role in the textile ongoing study of textile dyeing, it is probable that Hellot knew of Saxon green and Saxon blue. It is likely that he had not encountered these goods, however, and for him the results of his investigation of Roederer's samples were especially interesting and informative. Lacking a reliable coloring source to create green colors in a single process, eighteenth-century dyers depended on separate dyeings of blue and yellow to create green colors. In general, yellow was the more fugitive component in this process; noticeable color loss occurred even with sources classed as *grand teint*. When the blue color in Roederer's samples disappeared in the standard tests, Hellot recognized that an uncommon material or process had been used. That realization, combined with the notoriety of Saxon blues and greens as fashionable colors, inspired Hellot to investigate further. His findings would permit other French dyers to reproduce these new colors, and to expand their technical skills. The investigation would also provide, to those interested in theories of coloration, information about a new process that might confirm or refine their ideas. Hellot queried several people, including both the Cardinal de Rohan, in Strasbourg (who had sponsored

the gift), and the French attaché in Leipzig. He collected other samples of Saxon-blue and Saxon-green cloth and set out to determine its secrets.

Il n'est pas nécessaire de faire venir des Teinturiers saxons, comme Mr le Mâal de Saxe le propose, puis que les Sr Koederer fait cette couleur, au moins aussi belle que celles de Grossenhayn. Car un teinturier établi à Strasbourg, par consequent sujet du Roy; il est plus juste qu'il profite, qu'un etranger, du benefice qu'en peut revenir.

Jean Hellot, "Sur le beau vert de Saxe," 1 January 1750, AN F/12/2259.

At first Hellot did not believe it was necessary to import dyers from Saxony in order to open the secret of these colors to French dyers; he would prefer, he noted, to compensate a French citizen such as Roederer for further experiment and improvement.⁴ After seeing Roederer's invention fail all tests but that of beauty, he prevailed on an assistant from Braunschweig whose father was a cloth merchant to obtain instructions. Those instructions were corroborated by a letter from a Swedish *physicien* (perhaps the mineralogist Axel Cronstedt), a correspondent of Hellot who had been visiting Saxony. The instructions were sent to a local dyer for testing.

Both recipes submitted called for cobalt, and this became a focus of Hellot's next set of investigations. Saxony was a center of that industry, and cobalt-derived blue or blue-based colors for ceramics (including colors known as Saxon blue or Saxon green) were both famous and extremely popular.⁵ They were closely associated with the Meissen factory, and their imitation at Vincennes, and ceramics works in Berlin, in Vienna and in England had been rapid. But if cobalt were also used to make Saxon-blue textiles, the large quantities of ore needed might make the color an impractical addition to the repertoire of French dyers.⁶ On further investigation, it was found that cobalt was not essential. The blue color was in fact made from indigo, through a new process (even now known as the Saxon blue process).

Under Hellot's guidance, the process to create Saxon blue was established and a pamphlet describing it was printed in 1750.⁷ Publication meant that the technique—or a technique—to create Saxon blue and Saxon green was no longer a secret kept from French dyers. Publication also meant that it was not a secret of French dyers, either, but available to anyone who found the publication, whether they were in Britain, the Netherlands, Italy, Germany, or somewhere else.⁸ The popularity of Saxon green and the availability of instructions to create it drew attention to the process in the following years. Descriptions and discussions appeared in specialist and general publications, both the periodical press and encyclopedias, increasing the reach of the information and ensuring that its audience extended beyond commercial dyehouses.⁹ Over the next several years, many people sent their version of a secret Saxon blue to French officials. Official interest in the methods may have been well known, or it could have been that notoriety made new or improved invention a popular target. Why not, John Holker

asked Hellot, offer rewards to encourage men to carry out research? Perhaps if they do not find what they seek they might discover something else useful.¹⁰

The Invention of Saxon Blue

Die Hauptmängel, welche an des Herrn Bergrath Barths Farben ausgestellt worden, bestehen darinn:

1. Daß sie mit scharfen Materien bereitet wären, davon die Tücher leicht mürbe werden könnten.
2. Daß ihnen der Regen, und überhaupt alles kalte Wasser, schädlich sey, und Flecken verursache.

Gottfried Michael Kortum, *Neue Versuche der Färbekunst*, (Breßlau, 1749) 4.

Saxon blue, the new technique that was the basis of this venture, was a discovery credited to one Barth, a town official in Grossenhain not far from Meissen and Dresden. The date of the discovery is generally given as 1743.¹¹ Almost nothing is known about its invention or early exploitation, although it is likely that it was undertaken by Barth or his son, who later petitioned the economic council in Dresden for support with other color inventions.¹² The colors quickly became familiar; by 1749 *sachsisches Blau* and *sachsisches Grün* were well established in the commercial vocabulary of German dyers and merchants. Saxon blue had even acquired a French name "sans pareille de Saxe"—ironic, in light of this episode. An outline of the process may have been available through the German periodical press. Apparently the trade-off between beauty, cost, and permanence was always recognized, and attempts to analyze and redress the problem were made early on. Johann Justi published a technique (one that included cobalt) in 1751 but two years earlier, Gottfried Michael Kortum, a doctor and chemist in Bielitz (Silesia), had outlined the faults of Barth's color and proposed variations to overcome them.¹³ Even then, Kortum noted that he was not the first to attempt revisions to the process. Kortum also expressed interest in extending the basis of the Saxon-blue process to other colors, and in much of his treatise he describes his efforts to do this and explains the theory underlying his processes.

The Saxon Blue Process

In the eighteenth century, the innovative step of the Saxon blue technique was digestion of the prepared indigo in oil of vitriol. The result of this addition, in modern terms, is that the coloring process is converted from that of a vat dye to that of an acid dye. In the eighteenth-century, this conversion shortened production time and reduced the quantity of heat necessary to complete the blue-dyeing process. The Saxon blue process (now called indigo sulfonate) creates colors that are bright and beautiful, and visually somewhat different from those obtained through the traditional indigo dyeing methods. The process was not without its difficulties, however. In particular, it was important to ensure the removal of the excess vitriol. Although wool tends to be more susceptible to

damage from alkalis, the use of such a strong acid can also destroy fibers. Yet even with such difficulties the Saxon-blue process offered many new possibilities for indigo dyeing and printing and, it seems, for other textile-coloration processes as well.¹⁴

C'est ce meme hazard qui nous a fourni le verd de saxe car quel est l'homme qui peut découvrir par ses propres lumieres une exception à la regle generale.

John Holker, "Réponse aux observations de Mr Hellot," 1765 AN F/12/1330.

Saxon blue and Saxon green are examples of a beautiful and desirable new specialty, at first closely linked to one person or one region, that was enhanced by the work of others living elsewhere. The history of the diffusion of Saxon blue resembles that of Turkey red more closely than of Prussian blue. All three began with a novel color of greater beauty than that which was made locally. Both involved a mysterious process that was investigated by people with a range of skill, experience, and interest. For both Turkey red and Saxon blue, distribution of an "official" technique seems to have inspired independent investigations, claims of prior discovery and further improvements. In contrast, Prussian blue had associations with different kinds of color manufacturing rather than with different communities of dyers.

Notes:

Note 1: Roederer, teinturier à Strasbourg, "Mémoire," n.d.; Cardinal de Rohan, in Strasbourg, to Rouelle, 19 February 1749; Galean des Issarts, in Dresden, to Rouelle, 26 March 1749; all in the folder "Vert de Saxe—Sieur Roderer de Strasbourg," AN F/12/2259.

Note 2: On patents of invention and the meaning of the *privilège* in France see Liliane Hilaire-Pérez, "Invention and the State in Eighteenth-Century France," *Technology and Culture* 32 (1991): 911–31.

Note 3: Jean Hellot, "Rapport sur la vert de Saxe du sr. Roederer," 1 January 1750, in the folder "Vert de Saxe—Sieur Roderer de Strasbourg," AN F/12/2259.

Note 4: Jean Hellot, "Sur le beau vert de Saxe," 1 January 1750, in the folder "Vert de Saxe—Sieur Roderer de Strasbourg" AN F/12/2259.

Note 5: Dena Katzenberg, *Blue Traditions: Indigo Dyed Textiles and Related Cobalt Glazed Ceramics from the Seventeenth through the Nineteenth Century*. (Baltimore, 1973).

Note 6: Jean Hellot, "Sur le beau vert de Saxe."

Note 7: *Manière de teindre un drap blanc en verd, nommé verd de Saxe* (Paris, 1750).

Note 8: "Dyeing Green and Blue Saxon Colours," English Patent no. 635 issued to George Spence, Charles Dolby and John Christopher Weguelin (8 August 1748); Schlögel to the French Council of Commerce (10 August, 1779), AN F/12/1339.

Note 9: "Manière de Teindre un Drap Blanc en Verd, Nommé Verd de Saxe," *Journal œconomique* (March 1751): 48–58; Peter Woulfe "Experiments to Shew the Nature of Aurum Mosaicum," *Philosophical Transactions* 61 (December 1771), 127–30.

Note 10: John Holker, "Reponse aux observations de M. Hellot sur l'inutilité de la proposition d'une prix pour la investigation de teinture en ecarlatte sur coton," 1765, AN F/12/1330.

Note 11: Rudolph Forberger, *Die Manufaktur in Sachsen vom Ende des 16. bis zum Anfang des 19. Jahrhunderts* (Berlin, 1958), 149.

Note 12: *Acta die von Joh. Carl Barthen zu Gr.Hayn erfundene blaue Farbe . . .* (1780-1782) Sächsisches Hauptstaatsarchiv Dresden Ms. 1200/11/115/XIX/1067.

Note 13: Johann Heinrich Gottlob von Justi, *Das entdeckte Geheimniss der neuen sächsischen Farben, benebst einigen Betrachtungen von dem Vorzug und der Theorie dieser neuen Färbekunst* (Vienna, 1751); Gottfried Michael Kortum, *Neue Versuche der Färbekunst, betreffend die, bisher unter dem Namen "Sans pareille de Saxe" bekannten blauen und grünen Farben* (Breßlau, 1749).

Note 14: Woulfe, "Experiments to Shew the Nature of Aurum Mosaicum;" Louis-Guillaume de la Follie, "Supplement aux experiments et observations sur la manufacture de huile de vitriol," 3 May 1770, AAR carton C/8.
