5

IMITATING CRACKLES: MATERIAL MIMESIS IN STONES AND TEXTILES

Marjolijn Bol

This chapter proposes to study the ways in which processes of making can perform in claims to knowledge and ownership from the perspective of imitation. It focuses on a special kind of imitation, "material mimesis," here defined as the phenomenon in which artisans used one or more materials to imitate the characteristics of another material.[1] Today, still, our daily lives are pervaded by practices of material mimesis. We walk on laminated floors made to look like wood and navigate the digital world through computer screens imitating the appearance of office spaces, and modern medicine can replace the materials of our bodies on almost every scale. Examples of material mimesis can be found across societies, in almost any period, and it occurs throughout a great variety of art forms. Ancient ceramic vessels, for instance, some nearly four millennia old, were often glazed to look like metals, or imprinted to look like straw; bronze and copper objects, in turn, were worked to assume the appearance of leather (figure 5.1). Medieval artisans gave wood the appearance of solid gold, and the sophisticated application of colored plaster was used to metamorphose seventeenth-century furniture into quasi-marble structures (figure 5.2).

In each of these examples, the mimetic materials or objects are appropriated or rejected through a wide variety of uses ranging from ritualistic, ethical, and aesthetic considerations to practices of deceit, social distinction, health, learned inquiry, adaptation to change, and play. Imitation fur that looks too much like real fur, for instance, may be rejected by those who have ethical reasons for not wanting to wear fur obtained from animals (or because they fear they may be judged by those who do have ethical concerns). To reject imitation fur on the basis of looking "too real" implies sophisticated material knowledge on the side of the users (i.e., what does real fur look like?), and this, in turn, plays a prominent role in shaping the materials and processes used to produce imitation fur (i.e., how to keep it fur-like while downplaying the resemblance to natural animal fur).

Many, if not most, material mimetic objects raise similar fundamental questions about how knowledge and ownership (1) were performed through the different social

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Figure 5.1
Flask (*bianhu*), Eastern Zhou dynasty, Warring States period (475–221 BCE). Bronze inlaid with copper, probably modeled after leather flasks. Lucy Maud Buckingham Collection, Art Institute Chicago (CC0 Public Domain Designation).

functions of practices of material mimesis and (2) shaped the materials and processes used to produce the imitations. This chapter explores these issues by focusing on two case studies in which the practice of material mimesis was defined by making, knowing, and owning "the crackle." I will study the ancient practice of imitating precious stones by crackling crystals and Western attempts at reproducing the crackle of batik textiles from the East between the eighteenth and twentieth centuries. In both cases, the dual conditioning of kn/own/ables is at work. What was known about the material characteristics of precious stones and traditional batik, as well as the processes by which these objects were imitated, determined their value and prestige and hence

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Figure 5.2
The Warwick Castle table, attributed to Baldassare Artima and Diacinto Cawcy, England, ca. 1671. The top of slate is decorated with scagliola, the frame of pine and beech faced with scagliola, imitating marble, and inlaid pietra dura. © Victoria and Albert Museum, London.

the ways they were desired and owned. The case of imitation batik also shows that when the social context in which it was consumed changed, the lack or unimportance of practical knowledge (or that actors assigned to it) eventually gave the textiles an entirely new meaning. This transformed the imitation material into a different kind of kn/own/able distinct from the "original."

CRACKLED CRYSTALS

Today, diamonds, sapphires, rubies, and emeralds can be created in the laboratory in such a manner that they have the same physical, chemical, and optical characteristics as gems produced by geological processes.[2] Sharing the same chemical and physical properties with their natural analogs, modern lab-created gems are just as hard, transparent, and brilliant as gems produced by nature. As a result, these synthetic gems can be distinguished from their natural counterparts only by trained experts using

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sophisticated equipment. Notwithstanding their physical correspondence, there are three crucial differences between natural and lab-created minerals. The first has to do with time: in nature it takes billions of years to create a precious stone, but in the lab the same mineral can be produced in the space of a few weeks. This means that lab-created diamonds, sapphires, rubies, and emeralds are less rare than their natural counterparts. Another important difference is that unlike gems produced by nature, lab-created gems are not procured by mining. The purchase of lab-created minerals therefore is not complicated by the same ethical issues that often surround mined minerals.[3] And, finally, stones produced by nature almost inevitably include other elements and defects that make each gem unique. In the controlled conditions of the modern laboratory, such inclusions and defects can almost be eliminated.[4] This means that synthetic diamonds, emeralds, sapphires, and rubies are purer than almost any of their natural counterparts. To find this kind of purity in a gem today therefore indicates that one is dealing with either an extremely rare mineral, or, quite the opposite, a lab-created stone material.

From this we can extrapolate that lab-created imitations of precious minerals become more desirable when consumers know and value the fact that their material makeup is identical to, or, in terms of purity, better than natural precious minerals, and/or when consumers know and care about the societal impact of the mining industry. Precious minerals produced by nature, on the other hand, become more desirable when consumers know and value rarity (also in terms of a natural stone's "uniqueness") over the reasons for wanting to own a lab-created imitation gem.

But what is it about "rarity" that makes something the object of our desire to "know" and "own" it? The answer to this question is not simply relative value, or economic worth. Our desire for the rare is deeply intertwined with the social-cultural prestige tied to owning something that, because of its scarcity, cannot easily be owned by others. To describe how rare materials were used as an expression of status, the renowned archaeologist Grahame Clark introduced the phrase "symbols of excellence"—"a quality which stems from aesthetic awareness but the striving for which lies at the very root of the civilizations created by man."[5] To explain this concept, Clark refers to Thorstein Veblen's economic theory of symbolic substances. In his seminal book *The Theory of the Leisure Class* (1899), Veblen coined the term *conspicuous consumption* to describe the act of buying symbolic objects to display one's social status. Since symbolic objects used as expressions of status are typically useless for purposes of daily life, Veblen terms them "conspicuous waste." Veblen points out that, often without realizing it, consumers appreciate the superior article not, as they like to think, because it has more intrinsic beauty, but because it is more rare and therefore more honorific. Veblen explains

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this idea with the example of why a handmade silver spoon typically has a higher value than a spoon made in a factory or of a base metal.[6] All three spoons are equally "serviceable" and, Veblen points out, do not differ much in terms of beauty. Still, the handmade silver spoon is more valuable because it is not so readily available as the base metal spoon or the one mass-produced in a factory; to own the handmade silver spoon, therefore, expresses status. To appreciate how an object expresses status in certain social contexts, however, one also needs to know something about the object's material properties and how the object is made. Indeed, only if the handmade silver spoon can be distinguished from its base metal or factory-produced counterparts can it be recognized as a symbolic object expressing the status of its owner. This leads us to consider two important questions that I will examine in what is about to follow: If the rare is typically the most honorific, in what instances can imitations of the rare become the subject of desires for ownership as well? And when this happens, how does it affect and/or how is it affected by consumers' knowledge about the materials and making of these imitations as opposed to their rarer counterparts?

We have seen that in the case of natural precious minerals, knowledge of the ethical aspects of the mining industry may increase consumers' desire to own lab-created minerals. This is quite similar, in fact, to why some prefer to own items made from imitation fur or leather over skins obtained from a certain species of animal. In the past, material, social, ethical, and cultural know-how of material mimetic objects likewise played an important role in defining their meaning and value as "ownable things" *and* deeply influenced how they were made and with what materials. Let us turn to a more ancient practice of making imitations of precious stones to study this in more detail.

In the Latin West, the practice of making imitation gems was first described by Seneca the Younger (ca. 1 BCE–65 CE) in his *Epistles*, or *Moral Letters to Lucilius* (*Ad Lucilium epistulae morales*). Seneca's letters to his friend Lucilius describe the history of civilization as it developed from a period called the Golden Age, during which mankind lived without distinctions of ownership or social status, to an age in which mankind exchanges this common ownership for the pursuit of luxury goods, something which Seneca deeply condemns.[7] In his nineteenth letter, Seneca deals with the argument of Posidonius of Apamea, who argues that philosophy was the inventor of the arts. To defend the thesis that wisdom comes from artisanal practice, Posidonius mentions several philosophers to whom important artisanal inventions were attributed. In response, Seneca introduces one of the alleged inventions of the pre-Socratic philosopher Democritus (460–370 BCE), who was said to have discovered how to turn "a pebble into an emerald by baking it, a procedure by which even today we color stones found to respond to it."[8]

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Seneca argues, however, that such inventions by philosophers are not proof that the arts are the province of philosophical knowledge:

> The sage may well have discovered these things, but not by virtue of his wisdom. In fact, he does many things that we observe quite unwise people doing just as well or even with greater skill and ease.[9]

For Seneca, philosophical and artisanal knowledge are two very different things. Yet, he does appear to consider the art of gemstone imitation to be one of such great skill that it could lead someone like Posidonius to confuse artisanal knowledge with philosophical knowledge.

Written at around the same time, Pliny the Elder's *Historia naturalis* contains similar comments about the remarkable skill with which gems were imitated. In Book 37, which deals with the natural history of gemstones, Pliny points out that "to distinguish genuine and false gemstones is extremely difficult, particularly as men have discovered how to make genuine stones of one variety into false stones of another."[10] Pliny adds that he knows of treatises that describe how to make such imitations:

> There are treatises by authorities, whom I at least shall not deign to mention by name, describing how by means of dyestuffs emeralds and other transparent coloured gems are made from rock-crystal. . . . And there is no other trickery that is practised against society with greater profit.[11]

Like Seneca, Pliny condemns the pursuit of luxury goods for the sole purpose of expressing status or wealth, and this is a recurring theme throughout the different books that make up the *Natural History*.[12] But Pliny condemns even more sharply the imitation gems produced for the sole purpose of cheating the buyer. Thus, he views the knowledge that helps detect such frauds as something that may empower the consumer and that should therefore be recorded and shared: "I, on the other hand, am prepared to explain the methods of detecting false gems, since it is only fitting that even luxury should be protected against deception."[13]

No treatises detailing the practice of gemstone imitation have survived from Pliny's time or earlier, but a later echo can be found in a collection of recipes dating to the fourth century CE, the so-called Stockholm Papyrus. The Stockholm Papyrus contains more than seventy recipes for the imitation of precious stones, including ruby, beryl, amethyst, and sunstone.[14] This document, written in Greek, was possibly copied as a funerary gift around 200 to 300 CE, but its recipes are believed to have belonged to a much older tradition.[15] Significantly, the recipes included in the Stockholm Papyrus do not focus on trying to approximate the supposed perfection of natural precious stones, but rather on recreating their typical flaws to make a convincing imitation. As

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mentioned above, natural precious minerals are often marked by elemental inclusions and internal cracks and fissures. It was these cracks and fissures that provided an opportunity for creating imitation gems, and translucent precious minerals in particular.

The papyrus recipes explain that to imitate a precious stone, a less rare, colorless, transparent mineral such as rock crystal (a clear quartz variety) had to be "opened up" so that it could become receptive to the colorants that were supposed to transform its appearance into that of a rare translucent ruby, emerald, or sapphire. The recipes are various, but the main procedure typically involves crackling transparent minerals by heating them and then quickly cooling them down in a liquid:

> Put the stones in a dish, lay another dish on it as a cover, lute the joint with clay, and let the stones be roasted for a time under supervision. Then remove the cover gradually and pour alum and vinegar upon the stones. Then afterward color the stones with the dye as you wish.[16]

As a result of the quick decline in temperature, the stones crackle inside, with some of the fissures reaching the surface of the stone (figure 5.3). The main challenge would have been to keep the stone from breaking, because either the direct heat from the fire or the quick change in temperature could cause the crystal to shatter rather than crackle. Some of the recipes in the papyrus address this concern. A recipe for the "preservation of crystal" calls for heating the stone in a fig to prevent the stone from breaking under the intense heat of the fire:

Figure 5.3
Quench-cracked quartz crystals. Pieces of quartz were heated and then quenched in cold water. The photo shows the numerous small fissures that are the result of this treatment. This network of fissures (reaching up to the surface of the crystal) allow the dye to penetrate the stone when it is heated again and quenched in the dye liquid (see figure 5.4). Photo by Marjolijn Bol.

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> Preservation of Crystal.
> In order that small stones which are prepared from crystal do not break into pieces, take and open a fig, put the stone therein, and lay the fig upon the coals to roast.[17]

After the stone was successfully crackled, it had to be heated again—thus slightly opening the newly created cracks—and then it was dipped into a dye bath. The recipes suggest that these dye baths typically consisted of a natural resin (a viscous substance exuded by trees and other plants)—made liquid through the application of heat—in which a colorant (a dye or a pigment) was dissolved:

> Boiling of Stones.
> If you wish to make ruby from crystal, which is worked to any desired end, take and put it in the pan and stir up turpentine balsam and a little pulverized alkanet there until the dye liquid rises; and then take care of the stone.[18]

When certain colorants, such as the dye alkanet (extracted from the roots of *Alkanna tinctoria* (L.) Tausch) in the recipe above, are mixed with liquid resin, they become dissolved in it.[19] When the previously crackled crystal is reheated and then dipped in this substance, it soaks up the warm, colored resin mixture through the phenomenon of capillary action before the cracks "close" again due to the sudden change in temperature.

With the colored resin solution now inside the crystal, the stone assumes the appearance of a colored, translucent mineral (figure 5.4). Even though its physical and chemical properties are markedly different, such dyed quartz may appear quite similar to precious minerals produced by nature. This is especially true when we consider that most of the gems available in the postclassical and early medieval period would not have been of the highest purity and clarity. The greater number of available precious stones would have been marked by inclusions, internal cracks, and fissures. Thus it

Figure 5.4
Imitation gems colored with copper green and alkanet (red dye) dissolved in hot resin. Photo by Marjolijn Bol.

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appears that the knowledge of these natural imperfections not only inspired the processes used to imitate precious minerals with quartz, but also influenced the success of the imitation. If the consumer was aware of the natural flaws in gems, such knowledge of the natural material could make the imitation gem more convincing. But what, then, did "success" in terms of these imitation gems entail?

Historical sources suggest that an important use of dyed quartz was for committing fraud. As we have seen with Pliny, sources stress the difficulty of discovering fake gems among the natural stones, and they provide the reader with a variety of methods for their identification.[20] Similarly, in his seventh-century *Etymologiae*, Isidore of Seville writes about the skill with which imitations of gems—in this case, *smaragdi* (emeralds)—were produced:

> As a substitute for that most precious stone, the *smaragdus*, some people dye glass with skill, and its false greenness deceives the eyes with a certain subtlety, to the point that there is no one who may test it and demonstrate that it is false.[21]

However, precious stones were imitated not only to deceive innocent consumers into thinking they were buying a natural gem; gemstone imitations were also produced for aesthetic, ritualistic, religious, and pecuniary purposes. In these instances, the material mimetic gems were known to be imitations and were appreciated as such. The more convincing they were, the more valuable they became. Again, this implies a rather specific kind of knowledge on the side of the consumer, not just about the natural material but also about what constitutes a skillfully made imitation.

The most obvious reason for wanting to own an object that imitated rare and desirable materials is that they were typically cheaper than objects made from solid gold or silver and decorated with the rarest of natural gems. Owning an object that looked like a solid golden piece could, for instance, help a less wealthy monastery or church acquire a set of liturgical objects that fulfilled the same purpose as the objects owned by the wealthiest of religious institutions. Yet, objects characterized by material mimesis not only served as cheaper substitutes for the rare; they were also ordered and owned by the richest of patrons. Examples of the latter can be found in instances where imitations of precious stones were used as grave gifts, a practice found in some of the earliest known societies. In these practices, material mimetic objects were used to "replace" certain materials in the deceased's journey to the afterlife.[22] Imitations of gems also played an important role in the decoration of a variety of medieval religious objects. Reliquaries, for instance, were often set with gemstone imitations made from colored, translucent glass. In addition to being decorated with imitations of precious stones, religious objects were often entirely material mimetic. They were typically made of wood decorated with gold and silver leaf set with imitations of enamels and precious stones

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so that they appeared to be made of solid gold or silver and studded with gems. On a much larger scale, the embellishment of medieval churches with colored glass windows needs to be understood in a similar light. The saturated colors of blue, red, green, and yellow glass were meant to give worshippers the impression that the House of God was illuminated by translucent sapphires, rubies, emeralds, and gold. In these glass imitations, however, the crackle did not play a role. Since natural precious stones occur only in small sizes, it is impossible to glaze an entire building with them, even for the richest of patrons. The purpose of stained glass windows was thus to imitate only the best qualities of natural precious stones—their saturated color and their ability to transmit the visible light—on a scale that would have been impossible were natural minerals used. To this end, the goal was to procure only the clearest of colored glass. The crackle, a fundamental technique for giving color to gemstone imitations with crystal, was not required to give color to stained glass windows. But what is more, the crackle was undesirable in this case because it would have been considered unfitting to enlarge a defect of a natural material to embellish a religious building. Indeed, in the case of the stained glass window, it was the imitation of the flawless nature of the rare that became the subject of desire for ownership.

To be able to identify a material mimetic object and distinguish it from the materials it was meant to imitate *and* to know the creative skill necessary to produce it—that is, to have an explicit, practical knowledge of how this was done, or to be aware that this skill was being applied—played an important role in the desire to own material mimetic objects. This becomes especially clear in the second example discussed in this chapter: European attempts at imitating handpainted textiles from the East.

CRACKLED CLOTHS

The production of cloths by means of a dye-resist method goes back to ancient Egypt (at least), and over the course of the centuries, it developed independently in various geographical regions. The art form itself may be an ancient kind of material mimesis, as it likely developed from the desire to create alternatives for the more laborious practices of weaving and embroidering. To decorate a textile by means of a resist method, patterns are applied by painting or printing designs on the cloth in a dye-resistant substance such as wax or a paste (e.g., rice, gums, clay, etc.), or by using the more modern discharge method, in which a chemical agent resists penetration of certain dye types. Another well-known method is to tie (e.g., tie-dyeing) or stitch a pattern, or to create a patterned stencil that can be attached to the cloth during its immersion in the dye bath. When a cloth is dyed by one of these methods, it remains uncolored in the areas where the resist

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was applied. To obtain multiple colors and patterns, the process can be repeated several times by changing or increasing the resist areas and dipping into different colors.[23]

The history of the West's engagement with resist-dye textiles goes back to the sixteenth and seventeenth centuries, when Europe started importing textiles from the East.[24] The sophistication of the colorful painted and printed patterns of these cloths was completely new to Western consumers (figure 5.5). Up til then, the European textile industry had been concerned mostly with embroidering and weaving silk and wool. Compared to the East, it was much less advanced in its knowledge of creating designs on cloth, particularly on cotton, by means of handpainting or printing. We know that carved woodblocks were used to imitate patterns of velvet and damask on linen since at least the beginning of the fifteenth century, when the technique was first described by the Italian painter Cennino Cennini. In his *Il libro dell'arte*, Cennini provides us with recipes for the production of all kinds of painting, including painting on walls, panels, glass, and, indeed, printing colors on cloth. Figure 5.7 shows an example of such an early printed textile produced by a block next to the type of velvet cloth it was meant to imitate (figure 5.6).

According to Cennini, block-printed textiles made from hemp cloth are good for the clothing of young boys and "for particular lecterns in churches." He explains that a walnut or pearwood block, which ought to have the dimensions of a "terracotta block or brick," has to be carved with a continuous pattern on four of its sides: "Any kind of silk drapery that you like should be drawn on it, whether with leaves or animals." The block has two uncarved sides; one is fitted with a handle to be able to apply the pattern without disturbing the ink and the other is used for resting the block. Cennini explains that the preferred binding medium for the pigments used to create the patterns is "liquid varnish," a viscous mixture of linseed oil and natural resin (also used in the practice of gemstone imitation described above) cooked together on a fire. A cloth is stretched on a frame so that the print can be applied systematically by "rolling" the block over the textile. The pattern may be decorated further by handpainting it with other colors mixed with an oil-resin binder, the color palette being limited to a variety of yellow, red, green, blue, black, and white pigments and their mixtures.[25]

European recipe treatises since the fifteenth century suggest that in addition to this block printing, fabrics such as silk and linen and even paper were handpainted with pigments ground with linseed oil or varnish.[26] After having been painted in this manner, such fabric or papers were drenched with oil or varnish to make them see-through and, stretched on a frame, were used to imitate colored, translucent glass. In both Cennini's printed cloth and the handpainted screens, the applied colors are pigments mixed with a binder. This means that unlike in the mordant-dyed textiles produced in

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Figure 5.5
Quilt, Coromandel Coast (made for the European market), painted and dyed cotton chintz, ca. 1700. Nr. IS.121–1950, © Victoria and Albert Museum, London.

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Figure 5.6
Silk fragment, lampas weave, Italy, ca. 1375–1399. Nr. 1941.391, Cleveland Museum of Art.

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Figure 5.7
Block-printed linen, woven (originally black), Germany (probably), 1350–1400. Nr. 1745–1888, © Victoria and Albert Museum, London.

the East, there is no chemical bond between the color and the fabric's fibers. Cloths printed or painted in this manner will not withstand washing as a mordanted fabric would, and this greatly reduced their practical appeal.

In addition to their lack of knowledge concerning the direct application of dyes, Europeans also did not have the range of permanent and radiant dyes known to cloth dyers in the East.[27] In 1689, the Englishman John Ovington remarks on this fact when he writes in his travel notes,

> In some things the Artists of *India* out-do all the Ingenuity of Europe, *viz.* in the painting of Chites or Callicoes, which in *Europe* cannot be parrell'd, either in the brightness and life of the colours, or in their continuance upon the Cloath.[28]

Before their first attempts at exporting printed cloths in imitation of Eastern textiles, Europeans had to acquire expertise in permanent dyes and their application by means of mordanting. It is significant that these efforts were largely focused on improving methods for the printing of cloths; the manual painting techniques practiced in the East were not explored further. Two additional innovations were also crucial for the development of the printing of cloth: the use of engraved copper and faster methods for printing the patterns.

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In the eighteenth century, it was discovered that with the use of engraved copper plates as opposed to the high-relief woodblocks that Cennini had also described, high-quality prints full of detail could be achieved. But because everything was printed by hand, the process was still quite laborious. In terms of cost, too, these European printed textiles could not compete with textiles in local markets in the East.

It was not until the implementation of more efficient rotary and block-printing methods in the textile industry that fabrics could be produced quickly and cheaply enough to become a viable export product.[29] By the middle of the nineteenth century, factories in Great Britain, Belgium, and the Netherlands were competing to produce imitations of textiles imported from the East, with a special focus on batik textiles from Indonesia. Maxine Berg, in her work on the import and imitation of luxury goods from India, China, and Japan, points out that a century earlier, the West's efforts to imitate Eastern commodities for their own markets were largely fueled by taste and style. The knowledge of production of these traditional textiles remained in the East, and as a result, the ensuing technological advances that produced the Western imitations were far removed from their Eastern counterparts in terms of materials and technique. According to Berg, European imitations derived their prestige not from the materials with which they were made, "but from the craftsmanship that so effectively replicated the natural world—in the case of printed calicoes, the vividly imitated European and exotic flowers and gardens."[30] It is remarkable, therefore, that by the nineteenth century, when textile printing techniques had improved to the extent that European fabrics could now be exported to Eastern markets (and the Indonesian Archipelago in particular), it was not just the patterns of the cloths but also their material qualities for which local consumers judged them and, in some cases, rejected them.

The resist-dye process of Indonesia, referred to as *batik*, involves the application of hot melted wax, typically mixed with resin, to create a patterned resist.[31] Via freehand drawing, a bamboo or copper-spouted stylus (canting), or copper stamps (cap), the resist is applied on both sides of the fabric so that after dyeing, the textile is decorated with the same pattern on each side. The techniques of handpainting and canting are laborious, and depending on the complexity of the pattern and the number of colors used, it may take several days to produce a batik cloth. For the most exquisite designs, a relatively small piece of cloth may take several months to produce (e.g., a *sarung* is about 2.5 meters). To own these more sumptuous batik garments was a privilege reserved for the upper strata of society.

European textile manufacturers assumed a potential market for industrially produced imitations that would undercut the price of traditional batik textiles.[32] Thomas Stamford Raffles (1781–1826), lieutenant governor of Java and neighboring islands between

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1811 and 1816, was one of the first to point out the potential of selling batik imitations produced by the British textile industry on the island of Java. Raffles sent traditional batiks to England to be studied by British manufacturers for the purpose of imitating them. Yet, the British imitations that were produced on the basis of his samples were not immediately successful.[33] In his *History of Java*, Raffles argues that this was because after one washing, "the natives had discovered that the colours would not stand," and this was "a disadvantage which all the British printed cottons labour under."[34] He wonders:

> Would it not tend greatly to the improvement of the British manufacture, and consequently greatly extend the export, if the enquiries of scientific men in India were directed, in a particular manner, to an observation of the different dye stuffs used in Asia, and to the manner followed by the natives in different parts, for fixing the colours and rendering them permanent?[35]

In the next decades, with the invention of an increasing number of synthetic dyes, these issues with dye permanency would largely be dealt with. Manufacturers would soon find out, however, that the greater durability of imitation batik did not guarantee its success in local markets in the East. Traditional Indonesian batik is characterized by small crackles over the surface of its pattern, as can be seen in the eighteenth-century shawl or belt today kept in the Art Institute of Chicago (figure 5.8). These crackles are the result of the wax slightly breaking during drying. The broken wax allows the color to penetrate the resist in the dyebath, resulting in an accidental pattern of colored crackles over the surface of the cloth. Traditionally, artisans would have tried to prevent the wax from breaking, but even with the greatest care, crackling can never be completely avoided.[36] It is therefore significant that when the Westerners first started exporting their industrially produced batik imitations to Indonesia, they quickly found that their cloths did not meet with approval because the crackle was missing from their factory-produced imitations. Indeed, rather than being considered a mistake or error, the craquelure patterns of traditional batik had become one of the most important signifiers for attributing value and ownership to this textile. To know the crackle was to understand the material characteristics of traditional batik cloth and the methods by which it was produced. And knowing the crackle helped consumers in the East distinguish European imitation batiks from traditionally produced cloths. In fact, the crackle had become so important to the identity of traditional batik that imitating it became a prerequisite for Western imitation batiks to be successful in Eastern markets.

As a result, printers in the West became ever more inventive in trying to imitate the crackled surface of traditional batik. An early solution involved engraving a pattern of crackles in the copper plates or the rollers of the presses used for printing batik imitations.[37] But the engraved crackles looked quite different from the organic

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Figure 5.8
Selendang (shawl) or belt, batik dyed, Java, 1775–1825, 168.2 × 103.1 cm. Nr. 1938.241.1–2, gift of Mrs. Charles H. Worcester. Art Institute Chicago (CC0 Public Domain Designation).

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crackles produced by the accidental breaking of the wax. To consumers in the East, the engraved crackle patterns appeared rough and unnatural; consumers immediately recognized these cloths as imitation batiks and did not appreciate their appearance.[38] European printers, most notably the Belgian printer Jean Baptiste Theodore Prévinaire (1783–1854), active in the Dutch city of Haarlem, therefore searched for new methods to improve the material mimesis of batik. In 1844, Prévinaire patented a method that he insisted "was similar in all respects" to the batik produced in the East. He proposed a method in which resin mixed with wax had to be applied while warm. During the drying process the resin cracked, and this generated the sought-after pattern of fine veins that traditional batik was known for.[39] Although this method was not new to the textile industry, Prévinaire was the first to realize its potential for enhancing his batik imitations with unique crack patterns. With this, Prévinaire appropriated an important aspect of the traditional production process of batik, and by way of his patent, he turned this knowledge into an economic asset.

In addition to the crackle, European cotton printers also tried to imitate another visual characteristic typical of traditional batik: the flow effect that appeared when using brown dyes. In the traditional batik process, the brown dyes, unlike the other colors, had to be applied in a warm bath. This meant that the wax remained somewhat liquid from the heat and, as a result, the dye paint penetrated the painted resist wax pattern, causing some flowing out of the color. European printers discovered ways to mechanically reproduce this effect and eventually started using it with colors other than brown as well.[40] Such reengineering of a visual effect seen in the original textile can be considered a form of new knowledge (i.e., a new method of production), but depending on how the new material mimetic fabric was put into the market, it could also sideline the original makers and owners of batik textiles (i.e., the new technology could take over local batik production). Interestingly, and as we will see in the next section, this did not happen in the case of imitation batik. The material nature of locally produced batik was so important to Eastern consumers that Western attempts at visual imitation of the textile were not enough to guarantee its success.

Indeed, European printers discovered that in addition to the visual characteristics of traditional batik cloths, the scent of traditional batik was crucial to the reception of their imitations. At first, Western textile printers did not know where the particular scent of batiked textiles came from. They speculated that it could be attributed to a special kind of wax, to certain local dyes, or even to a particular step in the batik process unknown to Western printers. Perhaps close observation of the traditional batik process would provide an answer? An 1855 report written by a Dutch agent of the Nederlandsche Handel-Maatschappij (NHM) based on the island of Java describes the outcome of his

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investigations into "the peculiar aromatic scent of Java-batiks."[41] The Dutch NHM agent meticulously observed the materials and processes used to produce batik. Based on this research and some further experimentation of his own, he concludes in his report that it must be the wax-resin mixture that gives batiks their particular aromatic scent. The cloths, as he describes, were infused with this scent during the process of washing off the resist after dyeing. To remove the resist from the fabric, batiks were washed in boiling water baths. The cloth was plunged into the boiling water several times, and this caused it to come into contact with the wax-resin mixture that was floating at the surface of the water bath. It was this treatment of immersing the entire cloth into the wax-resin mixture, the NHM agent argues, that was the "fundamental and first cause" of the scent of batik.[42] When Prévinaire learned that his imitations were lacking in this respect, he decided to add this step to obtain the special scent for his batik imitations.

Paradoxically, the reception of the European imitation batiks depended on how closely they resembled traditional batik textiles with respect to a material characteristic that the Eastern dyers traditionally were mostly trying to avoid: the crackle. As a result of their being confronted with European textiles that were able to imitate traditional batiks ever more closely, the crackle became a crucial signifier for batik's local identity. Eventually, locally produced batik imitations, produced with copper stamps, successfully challenged European imitation batiks, which quickly lost their place on the Eastern markets.[43]

It is well known that Western manufacturers of imitation batiks survived only because they discovered new markets for their products in Central and West Africa. The shortcomings of Dutch resist-dye textiles that were problems in the Eastern markets now became the textile's greatest strengths—on the African continent there was nothing better on the market than Prévinaire's extremely refined batik imitations, and because they displayed their colorful patterns on both sides, Western imitation batik was perfect for African wrap-style fashion.[44] Indeed, the "Veritable Java Print," "Guaranteed Dutch Java Hollandis," "Genuine Amsterdam," "Vlisco True Original"—just a few of the names by which these imitation batiks are known today—became highly prized commodities through which the African elite could express their social status. In Africa, the numbered designs, most of which are nowadays produced by the Vlisco company in a factory in the Dutch city of Helmond, were given local meaning by salesmen on the marketplace and by the consumers who purchased the textiles to transform them into clothing.[45] Imitation batik was so successfully adopted by the African elite that it is difficult to imagine African dress without the colorful textiles that have such an intricate history as material mimetic objects. As a result, the Dutch imitation batiks became the subject of a rather confusing tale of appropriation in which the last word has not yet been said.

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There is an additional twist to this story that should not be left out in the context of this volume. Ironically, Vlisco was almost put out of business in the 1990s because cheap Asian copies of their textiles flooded the market. The company survived because it reinvented itself as a luxury fashion brand, working together with both established and aspiring designers, including Jean Paul Gaultier and Yinka Shonibare. To thwart counterfeiting, Vlisco now brands all its textiles and has a disclaimer on their website that explains the uniqueness of their products and educates the public about the nature of "counterfeited" fabrics. In this case, consumers are informed about the production process of Dutch Wax Cloth to learn what constitutes an original Vlisco.

Interestingly, the "crackle," once so important in the East because of its connection to the traditional batik process, did not lose any of its prominence in Vlisco's reappropriation of the textiles. The "crackle," in fact, became one of the most important attributes of Vlisco's finest quality fabrics.[46] The process of purposely breaking wax ensured that no meter of Vlisco fabric is the same, and this became one of its main selling points. Again, as in the original batik process, the crackle helped impart a sense of uniqueness to each of Vlisco's textiles, even though it is produced mechanically. Vlisco's fabrics are therefore a case of material mimesis in which their history as imitation batik is embraced, but the changed social function of these fabrics on the African continent gave them new value as something unique as well. Here, the crackles became indicative of a quality and unique piece of imitation batik.

During the first decades of the twentieth century, artists of the arts and crafts movement again assigned new meaning to the crackle when they begin exploring handpainted batik. They argued that the subtle presence of crackles in batik textiles is a sign of artisanal skill that should not be recreated by mechanical means or other shortcuts. Pieter Mijer, a Dutch artist who worked in New York, was a great advocate of the art of batik in America. In 1919 he published a treatise, *Batiks, and How to Make Them*, in which he presents the technique of producing a batik cloth by handpainting. Mijer laments the fact that due to its popularity, making batiks had become a fashionable pastime comparable to "peasant wood-carving, burnt-wood work or sweater knitting," and that people also "tried to produce the effect [of batik] without work" (i.e., by producing imitations) in a so-called secret process that "enjoyed considerable vogue."[47] Mijer explains that the general public believed that these substitutes were real batik because the material had been dipped and some wax had been used, but

> anyone who knew anything about the genuine process was not fooled and recognized that stencils and various other fake methods had been utilized. The unlimited patience of the native worker was unknown, and unsung was the thoroughness of the painstaking craftsman. At this period the watch-word was "speed" and the results showed it.[48]

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Mijer continues that the importance placed on the "crackle effect" in batik imitations produced for the American and Dutch markets should be seen as part of the same development:

> Crackle certainly has its place in the beauty of batik, but the indiscriminate use of it as a complete motive of decoration in itself, is to be regretted. It would be used less, probably, if examples of the best native and European work were studied, in which real design and colour are the arresting features.[49]

Once again, the crackle had been appropriated. For Mijer, having thorough knowledge of the crackle in the traditional batik technique, and its proper application in contemporary handpainted batik art, helps distinguish a good artist from one with less skill, or even an amateur.

CONCLUSION

With a focus on the crackle, the two cases discussed in this chapter showed how the phenomenon of material mimesis prompts a negotiation of ownership between makers and users. In the case of imitating precious stones, colored resins were used to penetrate the crackles of colorless crystals in an attempt to come closer to the appearance of colored translucent gems—using a precious mineral's natural flaws to make the imitation and to make it more convincing. In the case of batik, resin likewise played a crucial role. Here, resin was the material responsible for the crackles in the handpainted batik cloth. These crackles in batik cloth were initially considered a defect, something the artisan tried to avoid in the final product as much as possible. But in conversation with Western attempts at mechanically imitating handpainted batik textiles, the sophisticated local material knowledge of a traditional product helped the crackle gain in importance. It became the means to *know* and *own* traditionally made handpainted batik textiles; to *know* and *own* its imitations and to assess their quality; and finally, instigated by their new role in African fashion, to *know* and *own* these imitations as something with a value and uniqueness independent of what they originally were meant to imitate.

The practice of material mimesis thus involved a complicated interplay between appropriation and ownership on the side of the consumer, the artisan, and the scholar. Artisans tried to transform one material to appear to be another as convincingly as possible either to show off their skill or, in the case of fraud, to disguise their craftsmanship to the best of their abilities. The context in which material mimetic objects were offered to the consumer was therefore crucial for their reception as either a marvel of artistic skill or a deceitful piece of work. But in both instances, consumers had to first know—that is, learn to recognize and understand—the creative mastery that went into the production of the material imitations in order to avoid accidentally buying a

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consciously fraudulent material mimetic product, and second, to be able to evaluate the skill and materials with which the mimetic object had been made. In the practice of "crackling," these practices of kn/own/ables thus come together in a unique way. The value of "crackled" objects in the sphere of economy (their use) is intertwined with practices of use and naming that hide or embrace the way in which the objects were produced as mimesis (the performance of this knowledge), or that designate a new object in a commercial process of rebranding independent of this knowledge. Hence, the example of the crackle in the imitation of both precious stones and batik shows that the consumer's knowledge about materials and production deeply impacts the ways in which artisan, industry, and later "materials science" shape and value the practice of material mimesis.

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Notes

1. Marjolijn Bol and Emma C. Spary, eds., *The Matter of Mimesis: Studies on Mimesis and Materials in Nature, Art and Science* (Leiden: Brill, forthcoming).

2. This fact has been the subject of a fair amount of discussion in recent years; see, e.g., Harriet Constable, "The Sparkling Rise of the Lab Grown Diamond," BBC, February 10, 2020, https://www.bbc.com/future/article/20200207-the-sparkling-rise-of-the-lab-grown-diamond.

3. Because of the huge amount of energy required to produce a lab-created mineral, the environmental benefit is less obvious. See, e.g., Rob Bates, "Just How Eco-Friendly Are Lab-Created Diamonds?," *JCK*, March 29, 2019, https://www.jckonline.com/editorial-article/lab-created-diamonds-eco-friendly/.

4. Features such as inclusions and defects can, of course, also be purposefully added to control the properties of the mineral.

5. Grahame Clark, *Symbols of Excellence: Precious Materials as Expressions of Status* (Cambridge: Cambridge University Press, 1986), 3.

6. Thorstein Veblen, *The Theory of the Leisure Class* (1899; New York: Macmillan, 1912), 126–128.

7. Christos P. Baloglou, "The Tradition of Economic Thought in the Mediterranean World from the Ancient Classical Times through the Hellenistic Times until the Byzantine Times and

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Arab-Islamic World," in *Handbook of the History of Economic Thought: Insights on the Founders of Modern Economics*, ed. Jürgen Backhaus (New York: Springer, 2012), 51–52.

8. Lucius Annaeus Seneca, *Letters on Ethics: To Lucilius*, ed. and trans. Margaret Graver and A. A. Long (Chicago: University of Chicago Press, 2015), 332 [Letter XC.33].

9. Seneca, *Letters*, 332 [Letter XC.33].

10. Pliny the Elder, *Natural History*, ed. and trans. D. E. Eichholtz, Loeb Classical Library 419 (Cambridge, MA: Harvard University Press, 1962), 10:227 [XXXVII.lxxv.197].

11. Pliny the Elder, 327 [XXXVII.lxxv.198].

12. Eugenia Lao, "Luxury and the Creation of a Good Consumer," in *Pliny the Elder: Themes and Contexts*, eds. Roy K. Gibson and Ruth Morello (Leiden: Brill, 2011), 35–56.

13. Pliny the Elder, *Natural History*, 327 [XXXVII.lxxvi.199–200].

14. The other half of the papyrus is kept in Leiden, and for this reason it is referred to as the *Leiden Papyrus*. The most extensive critical transcription and translation to date is Robert Halleux, ed. and trans., *Les alchimistes grecs*, vol. 1, *Papyrus de Leyde—Papyrus de Stockholm—Recettes*, Collection des Universités de France (Paris: Belles Lettres, 1981). For the English translation of the two papyri cited here (based on Otto Lagercrantz's German translation), see Earle Radcliffe Caley, "The Leyden Papyrus X: An English Translation with Brief Notes," *Journal of Chemical Education* 3, no. 10 (1926): 1149–1166, and Earle Radcliffe Caley, "The Stockholm Papyrus: An English Translation with Brief Notes," *Journal of Chemical Education* 4, no. 8 (1927): 979–1002.

15. Marcellin Berthelot suggests that the papyri may have been preserved in the mummy case of an Egyptian chemist, and Otto Lagercrantz argues that the papyri were a luxury copy (internal evidence shows the manuscripts are copied from another source) made for the purpose of entombment. This would also explain why they have been preserved after Diocletan's 296 CE decree banning all treatises dealing with alchemy. See Marcellin Berthelot, *Introduction à l'étude de la chimie des anciens et du moyen age* (Paris: G. Steinheil, 1889), 5; and Otto Lagercrantz, ed., *Papyrus graecus holmiensis (P. Holm.): Recepte für Silber, Steine und Purpur* (Uppsala: Akademiska Bokhandeln, 1913), 13:55.

16. Caley, "Stockholm Papyrus," 987 [nr. 54].

17. Caley, 987 [no. 24].

18. Caley, 985 [no. 31].

19. See also Marjolijn Bol, "Coloring Topaz, Crystal and Moonstone: Gems and the Imitation of Art and Nature, 300–1500," in *Fakes!?: Hoaxes, Counterfeits and Deception in Early Modern Science*, ed. Marco Beretta and Maria Conforti (Sagamore Beach, MA: Science History Publications, 2014), 108–129; and Marjolijn Bol, "The Emerald and the Eye: On Sight and Light in the Artisan's Workshop and the Scholar's Study," in *Perspective as Practice: Renaissance Cultures of Optics*, ed. Sven Dupré (Turnhout, Belgium: Brepols Publishers, 2019), 71–101.

20. For a discussion on these identification methods, see Bol, "Coloring Topaz," 121–124.

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21. Isidore of Seville, *The Etymologies of Isidore of Seville*, ed. and trans. Stephen A. Barney et al. (Cambridge: Cambridge University Press, 2006), 328 [XVI.xv.27].

22. Such practices have been extensively discussed in the field of archeology, where material mimesis is typically referred to as *skeuomorphism*. See, e.g., Michael J. Vickers and David Gill, *Artful Crafts: Ancient Greek Silverware and Pottery* (Oxford: Oxford University Press, 1994); and Michael Vickers, *Skeuomorphismus oder die Kunst, aus wenig viel zu machen* (Mainz: Philipp von Zabern, 1999). On the imitation of leather and wood in ceramic urns in which Irish Early Bronze Age cremations were deposited, see, e.g., T. G. Manby, "Skeuomorphism: Some Reflections of Leather, Wood and Basketry in Early Bronze Age Pottery," in *Unbaked Urns of Rudely Shape: Essays on British and Irish Pottery for Ian Longworth*, ed. Ian Kinnes and Gillian Varndell (Oxford: Oxbow Books, 1995), 81–88. And see also, for funerary ceramics impressed with textiles and other organic material culture, Linda Hurcombe, "Organics from Inorganics: Using Experimental Archaeology as a Research Tool for Studying Perishable Material Culture," *World Archaeology* 40, no. 1 (2008): 83–115, esp. 106–107. For the role of the skeuomorph in ritualistic practice, see also Jeroen Stumpel, "The Vatican Tazza and Other Petrifications: An Iconological Essay on Replacement and Ritual," *Simiolus-Netherlands Quarterly for the History of Art* 24, no. 2–3 (1996): 111–127.

23. For an overview of these techniques with references, see Gerald W. R. Ward, ed., *The Grove Encyclopedia of Materials and Techniques in Art* (New York: Oxford University Press, 2008), 696–705.

24. Anthony Reid, "Southeast Asian Consumption of Indian and British Cotton Cloth," in *How India Clothed the World: The World of South Asian Textiles, 1500–1850*, ed. Giorgio Riello and Tirthankar Roy (Leiden: Brill, 2009), 40.

25. Cennino Cennini, *Cennino Cennini's "Il libro dell'arte": A New English Translation and Commentary with Italian Transcription*, ed. and trans. Lara Broecke (London: Archetype, 2015), 232–238 [nos. 208–216].

26. This was still common in the nineteenth century. See, e.g., the English (expanded) edition of Pierre François Tingry, *The Painter's and Colourman's Complete Guide* (London: Sherwood, Gilbert, and Piper, 1830), 295–297.

27. Beverly Lemire and Giorgio Riello, "East & West: Textiles and Fashion in Early Modern Europe," *Journal of Social History* 41, no. 4 (2008): 898.

28. John Ovington, *A Voyage to Suratt in the Year 1689 Giving a Large Account of That City and Its Inhabitants and of the English Factory There* (London: Printed for Jacob Tonson), 282.

29. G. P. J. Verbong, "Katoendrukken," in *Geschiedenis van de techniek in Nederland: De wording van een moderne samenleving 1800–1890*, ed. H. W. Lintsen (The Hague: Stichting Historie der Techniek; Zutphen, Netherlands: Walburg Pers, 1992–1995), 3:59–61.

30. Maxine Berg, "In Pursuit of Luxury: Global History and Consumer Goods in the Eighteenth Century," *Past & Present* 182 (2004): 126–127.

31. Rens Heringa and Harmen C. Veldhuisen, eds., *Fabric of Enchantment: Batik from the North Coast of Java—From the Inger McCabe Elliott Collection at the Los Angeles County Museum of Art* (Los Angeles: Los Angeles County Museum of Art, 1996), 16, 224–230.

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32. See, e.g., Rens Heringa, "Javaanse katoentjes," in *Katoendruk in Nederland*, ed. Bea Brommer (Tilburg, Netherlands: Textielmuseum; Helmond, Netherlands: Gemeentemuseum, 1989), 131–156.

33. Maria Wronska Friend, "The Early Production of Javanese Batik Imitations in Europe (1813–1840)," in *Glarner Tuch Gespräche: Tagungsband Internationale Fachtagung vom 2./3. Juni 2016 im Hänggiturm Blumer & Cie., Schwanden zum Thema "Kunst und Geschichte des Glarner und europäischen Zeugdrucks,"* ed. Reto D. Jenny (Schwanden (Kanton Glarus), Switserland: Comptoir of Daniel Jenny & Cie, 2017), 50–51.

34. Thomas Stamford Raffles, *The History of Java: In Two Volumes* (London: Printed for Black, Parbury, and Allen, 1817), 216–217.

35. Raffles, 216–217.

36. For some colors there were exceptions; cloths dyed brown, for instance, were often purposefully crackled by crumpling the fabric before dyeing. See Verbong, "Katoendrukken," 73–74.

37. Verbong, 59–61.

38. Verbong, 73–74.

39. G. P. J. Verbong, "Technische innovaties in de katoendrukkerij en ververij in Nederland 1835–1920" (PhD diss., Technische Universiteit Eindhoven, 1988), 347 (appendix 13).

40. Verbong, "Katoendrukken," 73–74.

41. G. P. Rouffaer and H. H. Juynboll, *De Batik-Kunst in Nederlandsch-Indië en haar geschiedenis* (Haarlem, Netherlands: H. Kleinmann, 1899), I (appendix 1).

42. Rouffaer and Juynbolll, *De Batik-Kunst*, IV (appendix 1).

43. See, e.g., C. H. Krantz, "De Export van in Nederland bedrukte katoen naar het Verre Oosten en Afrika," in Brommer, *Katoendruk in Nederland*, 111–130.

44. Krantz, 115–130.

45. See, e.g., Nina Sylvanus, "The Fabric of Africanity: Tracing the Global Threads of Authenticity," *Anthropological Theory* 7, no. 2 (2007): 201–216; and Danielle Bruggeman, "Vlisco: Made in Holland, Adorned in West Africa, (Re)appropriated as Dutch Design," *Fashion, Style & Popular Culture* 4, no. 2 (2017): 197–214.

46. See, e.g., the description of Super-wax on the company website: "Super-wax is of the finest quality in wax print fabrics. For this product we use an extra densely woven, fine cotton fabric. Super-wax has a recognizable design signature as it always features two blocking colours showing a natural and unique crackling effect." "Product Information," Vlisco (website), accessed December 10, 2020, https://www.vlisco.com/support/product-information/.

47. Pieter Mijer, *Batiks, and How to Make Them* (New York: Dodd, Mead, 1919), 25–26.

48. Mijer, 26.

49. Mijer, 26–27.

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