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Beige

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Baker-Miller pink
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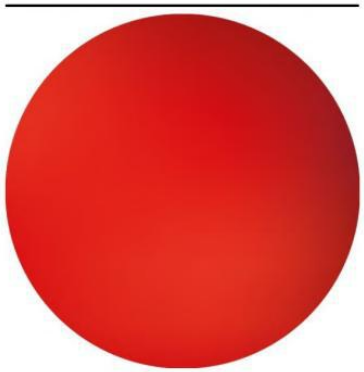

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Vermilion
Rosso corsa
Hematite
Madder
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Tyrian purple
Archil
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Mauve
Heliotrope
Violet

Ultramarine
Cobalt
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Prussian blue
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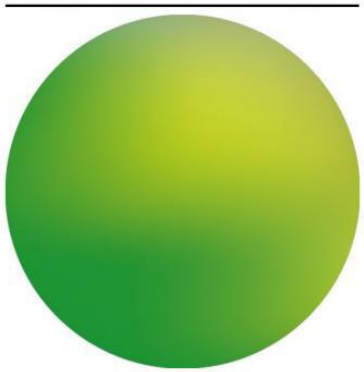
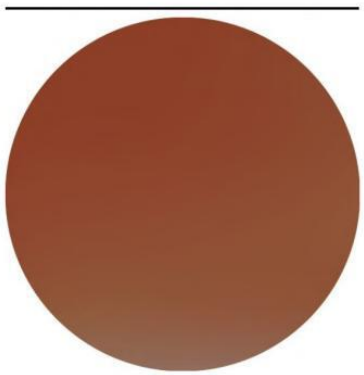
Woad
Electric blue
Cerulean



Verdigris
Absinthe
Emerald
Kelly green
Scheele's green
Terre verte
Avocado
Celadon



Khaki
Buff

Fallow
Russet
Sepia
Umber
Mummy
Taupe

Kohl
Payne’s gray
Obsidian
Ink
Charcoal
Jet
Melanin
Pitch black

Preface

I fell in love with colors in the way most people fall in love: while concentrating on something else. Ten years ago, while researching eighteenth-century women's fashions, I would drive down to London to gaze at yellowing copies of *Ackermann's Repository*, one of the world's oldest lifestyle magazines, in the Victoria and Albert Museum's wood-clad archive. To me, the descriptions of the latest fashions of the 1790s were as mouthwatering and bewildering as the tasting menu of a Michelin-starred restaurant. One issue described "[a] Scotch bonnet of garnet-colored satin, the ends trimmed with a gold fringe." Another recommended a gown of "puce-colored satin" to be worn with a "Roman mantle of scarlet kerseymere." At other times, the well-dressed woman would be nothing without a pelisse in hair brown, a bonnet trimmed with coquelicot-colored feathers or lemon-colored sarcenet silk. Sometimes there were colored plates accompanying the descriptions to help me decipher what hair brown could possibly look like, but often there were not. It was like listening to a conversation in a language I only half understood. I was hooked.

That worst and vilest of all colors, pea-green!

Arbiter Elegantiarum, 1809

Years later, I had an idea that would allow me to write about my passion month in, month out, turning it into a regular magazine feature. Each issue I would take a different shade and pull it apart at the seams to discover its hidden mysteries. When was it fashionable? How and when was it made? Is it associated with a particular artist or designer or brand? What is its history? Michelle Ogundehin, the editor of the *British Elle Decoration*, commissioned my column and in the years since I have written about colors as ordinary as orange and as recherché as heliotrope. These columns provided the germ for this book and I am profoundly grateful.

The Secret Lives of Color is not intended to be an exhaustive history. This book is broken down into broad color families and I have included some—black, brown, and white—that are not part of the spectrum as defined by Sir Isaac Newton.[1] Within each family I have picked out individual shades with particularly fascinating, important, or disturbing histories. What I have tried to do is provide something between a potted history and a character sketch for the 75 shades that have intrigued me the most. Some are artists' colors, some are dyes, and others are almost more akin to ideas or sociocultural creations. I hope you enjoy them. There are many wonderful stories that I didn't have room for here, so I have included a glossary (or color swatch) of other interesting hues along with suggestions for further reading.

I don't believe there are "off-putting" colors.

David Hockney defending another shade of green—olive, 2015

• • •

To view the colors featured in this book, access http://bit.ly/2ycmYgQ on a device that displays color.

Light is therefore color, and shadow the privation of it.

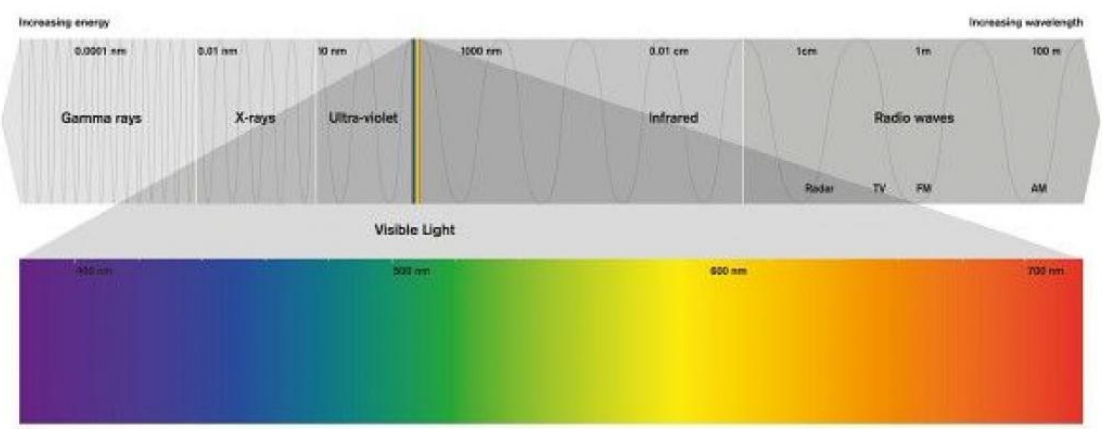
J. M. W. Turner, 1818

Color vision

How we see

Color is fundamental to our experience of the world around us. Think of hi-vis jackets, brand logos, and the hair, eyes, and skin of those we love. But how is it, precisely, that we see these things? What we are really seeing when we look at, say, a ripe tomato or green paint, is light being reflected off the surface of that object and into our eyes. The visible spectrum, as you can see from the diagram here, makes up only a small proportion of the entire electromagnetic spectrum. Different things are different colors because they absorb some wavelengths of the visible light spectrum, while others bounce off. So the tomato's skin is soaking up most of the short and medium wavelengths—blues and violets, greens, yellows and oranges. The remainder, the reds, hit our eyes and are processed by our brains. So, in a way, the color we perceive an object to be is precisely the color it *isn't*: that is, the segment of the spectrum that is being reflected away.

When light enters our eyes it passes through the lenses and hits the retinas. These are at the backs of our eyeballs and are stuffed with light-sensitive cells, called rods and cones because of their respective shapes. Rods do the heavy lifting of our vision. We have about 120 million in each eye; they are incredibly sensitive and principally distinguish between light and dark. But it is the cones that are most responsive to color. We have far fewer of these: around six million in each retina, the majority huddled together in a small, central spot called the macula. Most people have three different types of cone,[2] each tuned to light of different wavelengths: 440 nm, 530 nm, and 560 nm. About two-thirds of these cells are sensitive to longer wavelengths, which means we see more of the warm colors—yellows, reds, and oranges—than the cooler colors in the spectrum. Around 4.5 percent of the world's population are color-blind or deficient because of faults in their cone cells. The phenomenon is not completely understood, but it is usually genetic and is more prevalent in men: around 1 in 12 men are affected compared to 1 in 200 women. For people with "normal" color vision, when cone cells are activated by light, they relay the information through the nerve system to the brain, which in turn interprets this as color.



This sounds straightforward, but the interpretation stage is perhaps the most confounding. A metaphysical debate over whether colors really, physically exist or are only internal manifestations has raged since the seventeenth century. The squall of dismay and confusion on social media over the blue and black (or was it white and gold?) dress in 2015 shows how uncomfortable we are with the ambiguity. This particular image made us acutely aware of our brain's post-processing: half of us saw one thing, the other half something completely different. This happened because our brains normally collect and apply

cues about the ambient light—whether we are in full daylight or under an LED bulb, for example—and texture. We use these cues to adjust our perception, like applying a filter over a stage light. The poor quality and lack of visual clues like skin color in the dress image meant that our brains had to guess at the quality of the ambient light. Some intuited that the dress was being washed out by strong light and therefore their minds tuned the colors to darken them; others believed the dress to be in shadow, so their minds adjusted what they were seeing to brighten it and remove the shadowy blue cast. That is how an Internet full of people looking at the same image saw very different things.

Whiteness and all gray Colors between white and black, may be compounded of Colors, and the whiteness of the Sun's Light is compounded of all the primary Colors mix'd in a due Proportion.

Sir Isaac Newton, 1704

Without paint in tubes there would have been . . .nothing of what the journalists were later to call impressionists.

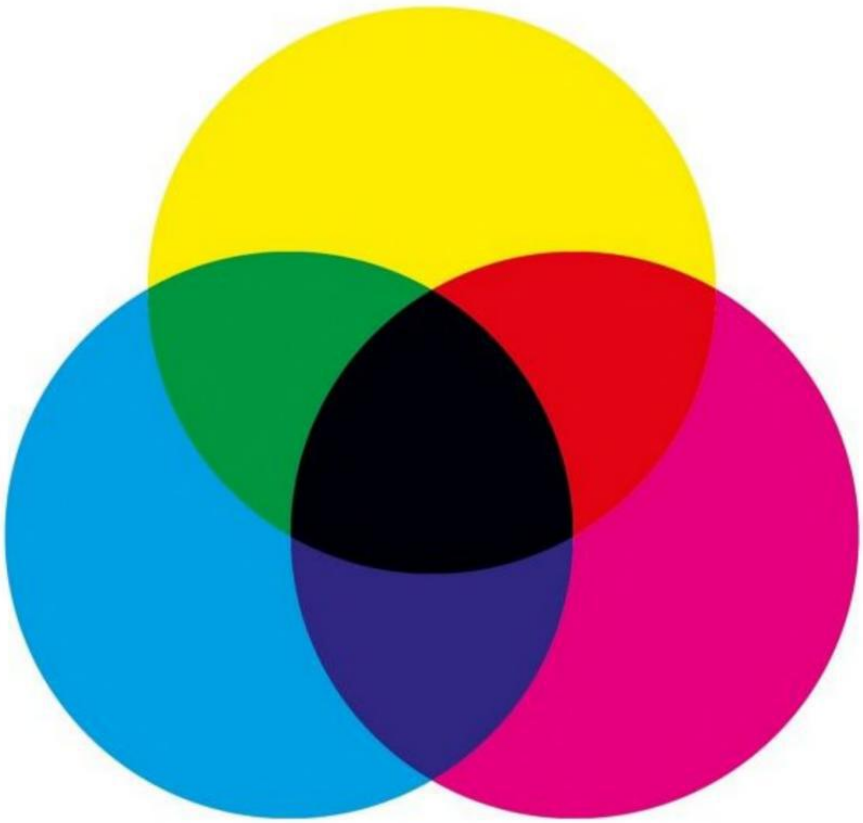
Pierre-Auguste Renoir, date unknown

Building the palette
Artists and their pigments

Pliny the Elder, a Roman naturalist writing in the first century A.D., claimed that painters in classical Greece used only four colors: black, white, red, and yellow. He was almost certainly exaggerating—the Egyptians had discovered a way of manufacturing a bright, clear blue [here] at least as early as 2500 B.C. But it is true that early artists were restricted, for the most part, to a small range of pigments they could extract from the ground or from plants and insects.

Humanity has been well served with earthy red- and yellow-toned browns from the beginning. The earliest pigment use that we know of is from the Lower Paleolithic period, about 350,000 years ago. Prehistoric peoples could render a deep black from the ashes from fires [here]. Some whites could be found in the ground; another was produced by early chemists from around 2300 b.c. [here]. Although pigments had been discovered, traded, and synthesized throughout recorded history, the process accelerated dramatically in the nineteenth century due to the burgeoning Industrial Revolution. More and more chemicals were being produced as by-products of industrial processes, and some made excellent pigments and dyes. William Perkin, for example, stumbled across the purple dye mauveine [here] while trying to synthesize a cure for malaria in 1856.

The availability of some pigments and the introduction of others has helped to shape the history of art. The palm prints and bison on the walls of prehistoric caves owed their somber palette to the pigments that the earliest artists could find in the world around them. Fast-forward several thousand years to illuminated medieval manuscripts, and the black and white remained unchanged, but flat fields of gold and several brilliant colors like red and blue had been added. Centuries later, the paintings of Renaissance artists or old masters benefited as much from a broader range of pigments as they did from realistic representations of perspective and sophisticated ways of dealing with light and shade. Some works from this time remain unfinished, with a single figure left as a simple sketch, because the artist couldn't afford the expensive pigments needed to complete the canvas. The clear blue ultramarine [here], for example, was so dear that the commissioning patrons often had to buy it themselves: the artists couldn't afford it. And customers often felt the need to specify, in written contracts, how much of the expensive paints they expected artists to use in the finished work, and which figures should be clothed in which colors, fearful that hard-up painters would use a cheaper alternative.[4]



Subtractive Color Mixing
By mixing a limited set of colors, many others can be created. A perfect mixture of primaries will yield black.

For their part, early artists had a very different relationship with their colors than modern artists. Because some colorants reacted with others, artists had to plan their compositions bearing potentially ruinous combinations in mind, ensuring that none overlapped or appeared next to each other. Most pigments were made by hand, either by the artists themselves or with the help of apprentices in their studios. Depending on the pigment, this could require grinding down rocks to powder, or the handling of technically challenging or poisonous raw ingredients. Pigments could also be obtained from specialists, including alchemists and apothecaries. Later, those who produced and traded in colors were known as colormen, and procured rare pigments from across the globe.

It was only relatively late in the nineteenth century that artists really benefited from a proliferation of ready-made pigments (and even then these weren't always reliable). Cheap compounds, such as cerulean, chrome orange, and cadmium yellow, freed artists from either pestles or unscrupulous colormen who sold unstable mixes that would discolor within weeks or react with other colors, or the canvas itself. Coupled with the invention of collapsible metal paint tubes in 1841, the new colors allowed artists to work outside and douse their canvases with the brightest pigments anyone had ever seen. It is small wonder critics were initially unsure: this was color as it had never been seen before, and it was dazzling.

Too often histories of color—what few there are—are limited to the most recent periods and to artistic matters, which is very reductive. The history of painting is one thing, the history of colors is another—and altogether more vast.

Michel Pastoureau, 2015

Vintage paint charts
Mapping color

In the dying years of the seventeenth century, a Dutch artist called A. Boogert made a concerted attempt to pin all known colors down. In a volume containing over 800 hand-painted swatches glossed with spidery black labels, Boogert described how to mix an array of watercolor tints, from the palest sea foam to deepest viridian. He is far from the only person to have attempted to catalog all known tints, shades, and hues. Scientists, artists, designers, and linguists have all spent time trying to chart courses through color space, and assign plot points with names, codes, or grid references. Pantone's index-card-style chips are the most famous modern solution to the problem of locking precise shades across linguistic and cultural divides, but it is only one in a long line of such efforts.

Because colors exist as much in the cultural realm as they do physically, such attempts are somewhat Sisyphean. Take, for example, the idea that colors can be grouped into two camps, warm and cool. We would unhesitatingly say that red and yellow are warm, and green and blue are cool, but this division can only be traced back to the eighteenth century. There is evidence that in the Middle Ages blue was considered hot, even the hottest of colors.

There are also discrepancies between the name a society gives a color and the actual color, and these can shift over time, like tectonic plates. Magenta [here], which is now considered a pink but was originally more purple-red, is one example. Others can be found among the wonderfully abstruse definitions in Merriam-Webster's *Third New International Dictionary*, published in 1961. Begonia is "a deep pink that is bluer, lighter, and stronger than average coral, bluer than fiesta, and bluer and stronger than sweet William." Lapis lazuli blue is "a moderate blue that is redder and duller than average copen and redder and deeper than azurite blue, Dresden blue, or pompadour." The intention of these descriptions was not to send the reader on a wild definition-chase through the dictionary; they were probably the work of color expert Isaac H. Godlove, a consultant hired by the editor of Webster's *Third* and the director of Munsell, a color-mapping company.[5] The problem is that, fun as these entries are now, average coral, fiesta, and copen have largely lost their cultural currency—they don't get the reader one iota closer to knowing what the color being defined actually looks like. By the same token, someone reading about avocado green in 100 years' time might be equally mystified: Is it the dark color of the skin that's meant? Or the clay green of the outer flesh? Or the butter tint near the seed? But for people today, avocado green [here] still has meaning.

Over the course of time the margin for error becomes ever greater. Even when the documentary evidence, such as a painting, remains, we are often seeing it in lighting conditions entirely different from the ones it was created in. It's the difference between looking at a house-paint sample on your computer screen, in the can at your local hardware store, and then on the walls in your home. Also, since many stable dyes and paints are recent innovations, the colors themselves may have deteriorated. Colors, therefore, should be understood as subjective cultural creations: you could no more meaningfully secure a precise universal definition for all the known shades than you could plot the coordinates of a dream.

It is the best possible sign of a color when nobody who sees it knows what to call it.

John Ruskin, 1859

Colorful language

Do words shape the shades we see?

It was a stern-faced British politician who first noticed something awry with the colors in ancient Greek literature. William Ewart Gladstone was a devotee of the poet Homer and it was while he was preparing the definitive tract on his hero in 1858 that he stumbled across some psychedelic oddities. Brows could certainly be black metaphorically—in rage—but was honey really green? Or the sea "wine-dark," the same color, bizarrely, as oxen, while sheep were violet? He decided to survey the Greek writer's entire oeuvre for color references. *Melas* (black), it turned out, was by far the most frequently used, with around 170 mentions, and there were about 100 mentions of white. Next—a steep drop in frequency—*erythros* (red), which was used only 13 times, while yellow, green, and purple were all referenced fewer than 10 times. Blue was not mentioned once. To Gladstone it seemed there was one possible explanation: that the Greeks were, in effect, color-blind. Or, as he put it, more sensitive to the "modes and forms of light, and of its opposite . . . darkness" than they were to color.

In fact, humans evolved the capacity to see in color several millennia earlier, so color blindness is not to blame. And it isn't only the ancient Greeks who seem to talk about color in ways that feel unfamiliar. A decade later Lazarus Geiger, a German philosopher and philologist, began to examine other ancient languages. He pored over the Koran and the Bible in its original Hebrew; he studied ancient Chinese stories and Icelandic sagas. All exhibited the same muddled references to color and, as he noted in one much-quoted passage on Vedic chants from India, the same omission.

> *These hymns, of more than ten thousand lines, are brimming with descriptions of the heavens. Scarcely any subject is evoked more frequently. The sun and reddening of dawn's play of color, day and night, cloud and lightning, the air and ether, all these are unfolded before us, again and again in splendor and vivid fullness. But there is one thing no one would ever learn from those ancient songs who did not already know it, and that is that the sky is blue.*[8]

When the word did appear, it evolved out of the words that had previously served either for green or, more commonly, black. Geiger believed he could trace humanity's seeming sensitivity to different colors through the evolution of their languages. All started out with words for light and dark (or white and black); next came red, and then yellow, then green, then blue. A wider study conducted in the late 1960s by Brent Berlin and Paul Kay confirmed a similar sequence. This, it was believed, meant two things: the first was that color categories were innate; the second was that if we didn't possess a word for a color, it affected our perception of it.

However, a broader survey, conducted in the 1980s, revealed many exceptions: languages that didn't necessarily "develop" in this way, and some that divide up color space entirely differently. Koreans, for example, have a word that distinguishes yellow green from regular green; Russians have different words for light and dark blue. A classic example is Himba, a language spoken by a tribe in southwest Africa, which splits the color spectrum into five slices. Another is Rennell-Bellona, a Polynesian language spoken on an atoll in the Solomon Islands, which roughly divides the spectrum up into white, dark, and red, where dark includes blue and green, and red includes yellow and orange.[9]

The subsequent literature on the relationship between language, color, and culture is maddeningly inconclusive. One camp—the relativists—say that language influences or even shapes perception and that without a word for a color we don't see it as distinct. The universalists, following Berlin and Kay, believe that basic color categories are universal and rooted, somehow, in our biology. What we can say for sure is that the language of color is tricky. Children who can discern the difference between a triangle and a square with ease may still struggle differentiating pink from red or orange. We also know that not having

a separate word for something does not mean we can't distinguish it. The Greeks, of course, could see colors perfectly; perhaps they just found them less interesting than we do.

Lead white
Ivory
Silver
Whitewash
Isabelline
Chalk
Beige

Lead white

Today the tombs of the rulers of the Goguryeo region lie inconveniently over the border between North Korea and China. They were a tough people: the Goguryeo, one of the Three Kingdoms of Korea, resisted the vast armies of its northern neighbors to rule over the peninsula and some of southern Manchuria from the first century B.C. until the seventh century. But the occupant of Anak Tomb no. 3, depicted in a giant portrait on the wall, doesn't look very warlike at all. In the fine-lined mural, he sits cross-legged in a litter wearing a dark robe decorated with bright red ribbons, an outfit that precisely matches the litter's drapes. His expression is benign to the point of looking slightly tipsy: his lips curve up under a curlicue mustache and his eyes are bright and a little unfocused. What is really remarkable, though, is how fresh his image remains after sixteen centuries in damp tomb air. The secret to his longevity lies in the paint used by the artist as the base layer to prime the cave wall: lead white.[1]

Lead white is a basic lead carbonate with a crystalline molecular structure. It is thick, opaque, and heavy, and there is strong evidence that it was being manufactured in Anatolia from around 2300 B.C.[2] It has remained in production the world over ever since, using roughly the same method described by Pliny the Elder 2,000 years ago. Strips of lead were placed in a compartment inside a specially designed clay pot that was divided into two. Vinegar was poured into the other half; then the pots were surrounded with animal dung and placed inside a shed with a tightly fitting door for 30 days. During that time,a relatively simple chemical reaction would take place. Fumes from the vinegar reacted with the lead to form lead acetate; as the dung fermented it let off CO_2, which, in turn, reacted with the acetate, turning it into carbonate (a similar process is used when making verdigris [here]). After a month some poor soul was sent into the stench to fetch the pieces of lead, by now covered in a puff-pastry-like layer of white lead carbonate, which was ready to be powdered, formed into patties, and sold.

The resulting pigment was tremendously versatile. It was used in the enamel on ceramic dishes and bathroom fittings, in house paints and wallpapers, well into the twentieth century. Artists liked it because it was so opaque and adhered well to almost any surface, and, later, because it could work in oils (if the proportions of the mixture were right). It was also cheap—a key concern for any self-respecting artist. In 1471, when the well-known Florentine muralist Neri di Bicci was buying some pigments in his hometown, he paid two and a half times as much for a good azurite as for *verde azzurro* (probably malachite); *giallo tedescho* (lead-tin yellow, here) was one-tenth the price of the azurite; while lead white was a mere hundredth the cost.[3] Artists were so generous with their use of lead white that, today, when paintings are X-rayed, its dense outline can form a kind of skeleton within a painting, allowing technicians to see alterations and later additions.

Lead white, however, had a deadly flaw. Writing in the Royal Society's *Philosophical Transactions* journal in the winter of 1678, Sir Philibert Vernatti described the fate of those involved in the production of white lead:

> *The Accidents to the Workmen are, Immediate pain in the Stomack, with exceeding Contorsions in the Guts and Costiveness that yields not to Catharticks . . . It brings them also to acute Fevers, and great Asthma's or Shortness of Breath . . . Next, a Vertigo, or dizziness in the Head, with continual great pain in the Brows, Blindness, Stupidity; and Paralytick Affections; loss of appetite, Sickness*

and frequent Vomitings, generally of sincere Phlegm, sometimes mixed with Choler, to the extreamest weakning of the Body.[4]

Lead poisoning was not a newly witnessed phenomenon, either. Nicander, a Greek poet and physician, describing the symptoms in the early second century B.C., condemned "the hateful brew . . . whose fresh color is like milk which foams all over when you milk it rich in the springtime."

It wasn't just those grinding and producing the pigment that began showing the effects of lead poisoning. White lead had long been used as a cosmetic to make skin look smooth and pale. Xenophon wrote disapprovingly of women wearing a "plaster of ceruse (white lead) and minium (red lead)" here in Greece during the fourth century B.C., and there is evidence that their contemporaries in China were mixing a similar brew with rice powder to use as a foundation.[5] Japanese archaeologists and professors are still discussing the role that poisonous makeup may have played in undermining the Shogun regime, which collapsed after nearly 300 years in power in 1868. Some scholars argue that breast-feeding infants were ingesting lead worn by their mothers; bone samples show that the skeletons of children under the age of three contain over 50 times more lead than those of their parents.[6] Yet cosmetic ceruse or "Spirits of Saturn"—essentially a white-lead paste mixed with vinegar—remained alarmingly popular for centuries. While at least one sixteenth-century writer was already warning that it made the skin "withered and gray,"[7] women in Queen Elizabeth's court were painting blue veins over its parchment-pale base layer. In the nineteenth century ladies could still buy any number of lead-based skin brighteners with names like "Laird's Bloom of Youth," "Eugenie's Favorite," or "Ali Ahmed's Treasure of the Desert," even after well-publicized deaths, including that of the British society beauty Maria, the Countess of Coventry. Maria, a rather vain woman, who was known to be rather too heavy a user of white-lead foundation, died in 1760, aged just 27.[8]

The irony of generations of women slowly killing themselves in an effort to look their best is of the darkest kind. Lead white may have helped the painted occupant of the Goguryeo tomb remain fresh, but then he was already dead. The pigment has seldom been a friend to the living.

Ivory

In 1831, a farmer on the Isle of Lewis, in the Outer Hebrides, discovered treasure that had been hidden in a small stone chamber in a sandbank for 700 years. The hoard consisted of 78 chess pieces from different sets, 14 pieces for a game similar to backgammon, and a belt buckle.[1]

The Lewis Chessmen, as they are now known, are mysterious. No one knows who made them, or how they came to be hidden on an obscure island.

Each piece is a unique Romanesque sculpture, oozing expressive charm. One of the queens has a hand resting on her cheek, in dismay or in concentration; several of the rooks are biting their shields, and another looks nervously to the left, as if he's just heard an unexpected sound. Each figure sports a subtly different hairstyle, and their clothes hang in stylized rumpled folds. They look as though they could be conjured to life, and this is precisely what happened in their recent star turn as models for the wizards' chess set in the first Harry Potter film. They were probably carved from walrus ivory (called "fish teeth" in Icelandic sagas), in Trondheim in Norway between 1150 and 1200. And while traces remain of the red some of the pieces were originally painted with, the color has worn away to reveal the natural color of the ivory itself.[2]

Ivory, whether sourced from walruses, narwhals, or elephants, has long been prized. And when elephant hunts became a status symbol, ivory only grew in prestige. The color profited by association. Western wedding dresses were generally colorful until Queen Victoria wore ivory satin trimmed with British lace in 1840. Many brides eagerly followed suit. The September 1889 issue of *Harper's Bazaar* recommended "[i]vory white satin and lampas [a type of woven fabric] . . . for autumn weddings." Now it is more common than ever; the Sarah Burton–designed wedding dress worn by the Duchess of Cambridge was made of ivory duchess satin.

Ivory itself was used for thousands of years to make costly decorative items, like the Lewis Chessmen, combs, and brush handles. Later it was used for piano keys, ornaments, and pool balls. Chinese craftsmen use it to make impossibly intricate sculptures, complete with trees, temples, and figures, which can sell for thousands of dollars. So fierce did demand become that by 1913 America alone was consuming around 200 tons of ivory annually. Because of their value, elephant tusks were called "white gold" and walrus tusks "Arctic gold."[3]

Demand for ivory took an inevitable toll on the animals supplying it. In 1800 there were an estimated 26 million elephants; before 1914 there were 10 million; by 1979, 1.3 million. A decade later, when the trade was finally banned in the West, 600,000 remained.[4]

Demand remains enormous, particularly in Thailand and China, although the latter has vowed to ban the trade of ivory entirely by the end of 2017. This ban, if effectively enforced, will have come in the nick of time. Illegal poaching is rife, and seems to be accelerating. It has been estimated that in the three years to 2014 around 100,000 elephants were killed for their ivory, and around 25,000 more tuskless carcasses are found each year. At this rate, the elephant could be extinct in the wild within a decade or so; walruses too are on the endangered species list.

A bizarre addition to the trade comes from an animal that became extinct nine thousand years before the Lewis Chessmen were carved. As the glaciers and icebergs melt across the Arctic tundra, woolly mammoth carcasses have emerged in the thousands. Exact figures are hard to come by—so much of the trade in ivory is conducted on the black market—but it has been estimated that over half of China's

current supply of ivory may have come from woolly mammoth tusks. In 2015 a single carved tusk weighing 200 pounds was sold in Hong Kong for $3.5 million.

Silver

It is not unusual for mountains to attract legends, but few are as rich in lore as Cerro Rico de Potosí, a soaring red peak in Bolivia. It isn't its size that attracts attention—at just under 16,000 feet it is far from the largest mountain in the Andes—but what it contains. From root to summit, Cerro Rico is riddled with silver mines. According to tradition, its secret was discovered by a poor local man. While out searching for a lost llama in January 1545, Diego Huallpa built a fire to keep the chill of the alpine night at bay. As the fire burned, the ground beneath it began to ooze liquid silver, like blood from a wound.

Owing to its value as a precious metal, silver has long held an important position in human culture, and we have never stopped seeking it out and finding uses for it. In the twentieth century it was used to evoke the future, space travel, and progress. From the shiny, zipped-up suits of the "Mercury 7," the world's first space crew, to Paco Rabanne's metal minidresses and André Courrèges's foil fashion in the 1960s, it seemed that silver was the color we would all be wearing once we'd become accustomed to zero gravity.

But it has symbolic affiliations with old-fashioned superstitions as well as an imagined future. In Scottish folklore a silver branch, covered with white blossoms or bearing silver apples, could act as a kind of passport into the fairy otherworld.[1] The metal was also thought to be able to detect poisons, changing color if it came into contact with one. This belief became so widespread that silver tableware became fashionable and then the standard. The first recorded appearance of the silver bullet being used to dispatch the forces of evil is from the mid-seventeenth century, when the town of Greifswald in northeastern Germany became all but overrun with werewolves. As the population dwindled it seemed as if the entire town might have to be abandoned, until a group of students made little musket balls from the precious metal. Silver is now firmly embedded in the semiotics of horror movies, effective against all manner of beings, from werewolves to vampires.[2]

Perhaps such superstitions stem from silver's link with the night. While its more illustrious sibling gold [here] is traditionally twinned with the sun, silver is equated with the moon. As a partnership this makes a great deal of sense. Silver also waxes and wanes in alternate cycles of polishing and tarnishing. One minute it is bright and reflective, the next it is eclipsed by a black film of silver sulfide. There is something in this imperfection that makes it more human: it seems to have a life cycle, and, just as we die, so its brilliance dies a little too.[3]

Although the metal occurs naturally—finding a piece glinting in the dirt must seem like finding a gift from the earth itself—it is more frequently mixed with other elements in subtly sheened ores and alloys, and must be extracted by smelting. In Egypt, silver beads and other small objects have been found that date back to the Neolithic era, and these became more common in the twentieth and nineteenth centuries B.C.[4] One Egyptian archaeological hoard contained 153 silver vessels, nearly 20 pounds of the metal in all.[5] It has been used ever since in jewelry, medals, decorative elements on clothes, and coins.

It was silver mined in South and Central America that allowed the Spanish Empire to flourish for nearly five hundred years. (The Spanish even named a country after it: Argentina's name is derived from the Latin *argentum*, meaning silvery.) Between the sixteenth and eighteenth centuries the conquistadors exported around 150,000 tons of the metal. This accounted for around 80 percent of the world's supply, and funded a series of wars and further conquests, both colonial and against European rivals. To extract silver ore from Cerro Rico, one of the two most profitable mines in their empire, the Spanish exploited

Isabelline

Isabella Clara Eugenia was, by the standards of her day, exceedingly beautiful. Like her English near contemporary, Queen Elizabeth I, she was very pale, with fine, marmalade-colored hair, only the merest suggestion of the Hapsburg lip, and a high, wide forehead. She was also powerful, ruling a large tract of northern Europe called the Spanish Netherlands.[1] This makes it seem all the more unfair that her namesake in the color world is a dingy yellow-white. As the author of *A History of Handmade Lace* described it in 1900: "a grayish coffee color, or in plain English, the color of dirt."[2]

The story goes that in 1601 Isabella's husband, Archduke Albert VII of Austria, began the siege of Ostend. Isabella, believing the siege would be short-lived, vowed she would not change or wash her underwear until he won Isabelline is the color the queen's linens had become when the siege finally ended three years later.[3] Luckily for the poor queen, proof that this story is nonsense isn't difficult to find. The tale only appeared in print in the nineteenth century—an aeon in Chinese-whisper years—and two exculpatory dresses in the hue crop up in the wardrobe of Queen Elizabeth I. Inventories, one taken a year before the start of the siege, show she owned both an isabelline kirtell (a long dress or tunic; she had 126 in total) and a "rounde gowne of Isabella-color satten . . . set with silver spangles."[4]

Mud, however, sticks, so despite royal endorsement, the color's fashionable career was short-lived. But it has managed to carve out another niche in the natural sciences, particularly in descriptions of animals. Pale palomino horses and Himalayan brown bears are isabelline, and there are several species of bird, including the *Oenanthe isabellina* or isabelline wheatear, that owe their names to the color of their pale dun plumage.

"Isabellinism" is also the name of a genetic mutation that renders feathers that ought to be black, gray, or dark brown a pallid yellowish color instead. A handful of the king penguins on Marion Island in the Antarctic make up one prominent group of sufferers.[5] Among the huddled ranks on the island, the wan mutants are the highly visible odd men out, the weaklings, and anyone who has ever watched natural-history documentaries knows what usually happens to them. A dubious legacy indeed for the poor Archduchess Isabella.