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

Green

There is a Buddhist fable about the color green. In the tale a deity appears to a small boy in a dream one night and tells him that to obtain everything he could ever desire all he need do is close his eyes and not picture sea green. The story has two possible endings. In one the boy eventually succeeds and finds enlightenment; in the other he is so consumed by his continued failure that life and sanity gradually slip away.[1]

Today green tends to conjure up comforting images of countryside and environmentally friendly politics. Despite its association with envy, it is generally seen as a peaceful color and is often associated with luxury and style. A glaucous shade was the darling of the art deco movement; emerald was Pantone's "Color of the Year" in 2013, while greenery, a tangier, leafy shade, has taken up this mantle for 2017.

The ancient Egyptian hieroglyph for the color was the papyrus stalk, a plant that the Egyptians held in high regard. In Latin the word for green is *viridis*, which is related to a large group of words that suggest growth and even life itself: *virere*, to be green or vigorous; *vis*, strength; *vir*, man; and so on.[2] Many cultures associate the color positively with gardens and spring. For Muslims, for whom "paradise" is almost synonymous with "garden," green became prominent from the twelfth century. It was the favorite color, along with white, of the Prophet Muhammad. In the Koran, the robes worn in paradise and silk couches scattered amidst the trees are both the color of leaves. And in medieval Islamic poetry Mount Qaf, the celestial mountain; the sky above it; and the water at its feet are all depicted in shades of green. This is why the color appears in the flags of many predominantly Islamic countries including Iran, Bangladesh, Saudi Arabia, and Pakistan.[3]

In the West green was particularly linked with the courtly rituals of spring. On May 1, for example, many

courts required members to *s'esmayer* or "wear the May," which in practice meant wearing a leafy crown or garland, or a prominent item of green clothing. Those who were *pris sans verd*, or showed themselves without this color, would be loudly mocked.[4] Possibly because of such rituals, and the inevitable flirtation and trouble they could cause, green also became the badge of youth and young love. The expression "to be green," meaning inexperienced, was already being used by the Middle Ages. Minne, a Germanic goddess who, like Cupid, was fond of shooting people with mischievous arrows of love, habitually wore a green dress, as did fertile young women—this is one interpretation, for example, of Jan van Eyck's *Arnolfini Portrait* (c. 1435) [page 214].

Despite such positive associations green had, in the West at least, something of an image problem. This was partially due to an early misunderstanding surrounding color mixing. Plato, the ancient Greek mathematician born in the mid-fifth century B.C., stoutly maintained that *prasinon* (leek color) was made by mixing *purron* (flame color) and *melas* (black). Democritus, father of atomic theory, believed pale green was a product of red and white.[5] For the ancients green was, like red, one of the middle colors between white and black, and in fact red and green were often confused linguistically: the medieval Latin *sinople* could refer to either until the fifteenth century.[6] In 1195 the future Pope Innocent III reinterpreted green's role in the divine order in an influential treatise. It must, he wrote, "be chosen for holidays and the days when neither white nor red nor black are suitable, because it is a middle color between white, red, and black."[7] This, theoretically, gave it far greater prominence in the West, but materially it was still rare: it never appeared in more than 5 percent of heraldic arms.

One reason for this is the long-standing taboo against creating green dyes and pigments by mixing blue and yellow. Not only was this poorly understood for many centuries—see Plato's assertions above—but there was also a deep aversion to mixing different substances together, in a way that is difficult to understand today. Alchemists, who routinely mixed elements together, were mistrusted, and in medieval art colors usually appeared in unmixed blocks with no attempt to show perspective by shading. In the clothing industry this was complicated by guild restrictions and the high degree of specialization: in many countries blue/black dyers were forbidden to work with red and yellow dye substances. In some countries anyone caught dyeing cloth green by dipping it in first woad [page 198] and then weld, a yellow dye, could face severe repercussions, including large fines and exile. Although there were some plants, including foxglove and nettle, that produced a green color without the need for any mixing, these did not produce the kind of rich, saturated color that people of taste and influence wanted to buy. The effect this had is plain from an offhand comment made by the scholar Henri Estienne in 1566: "In France, if one sees a man of quality dressed in green, one might think that his brain was a little off."[8]

Artists had to deal with inferior green pigments. The Dutch artist Samuel van Hoogstraten wrote in the 1670s: "I wish that we had a green pigment as good as a red or yellow. Green earth [page 227] is too weak, Spanish green [page 214] too crude, and ashes [verditer] not sufficiently durable."[9] From the early Renaissance, when the taboo against mixing began to fade, until the late eighteenth century, when new copper greens were discovered by a Swedish chemist called Carl Wilhelm Scheele [page 224], artists had to blend their own green paints.

Even this was tricky. Verdigris was prone to reacting with other pigments and even blackening on its own, and terre verte had poor tinting strength and luminosity. Paolo Veronese, who worked in Venice for most of his career during the sixteenth century and was, like Titian before him, an extremely skilled and resourceful colorist, was famous for being able to coax bright viridescent colors out of recalcitrant pigments. His trick was to apply a precise mixture of three different pigments in two layers and to protect green areas with layers of varnish to stop them reacting. Even he, though, had the occasional green mishap, and as late as the nineteenth century artists were struggling to produce reliable green. The grass in the foreground of Georges Seurat's *Sunday Afternoon on the Island of La Grande Jatte*, for example, appears withered in patches because of misbehaving pigments. This painting, one of the best-known examples of the pointillist technique and the work that launched the neo-impressionist movement, was created in the mid-1880s, which demonstrates just how recently painters were struggling against their materials.

The particular difficulties craftsmen and consumers had with green perhaps contributed to the color's symbolic link with capriciousness, poison, and even evil. The association with poison, at least, had some merit after the development and explosive popularity of the new copper arsenite pigments in the nineteenth century. Scheele's green and its close cousin—variously called vert Paul Véronèse, emerald green, Schweinfurt green, and Brunswick green—were responsible for many deaths, as unsuspecting consumers papered their homes, clothed their offspring, and wrapped their baked goods in an exciting new shade that contained lethal doses of arsenic.

The other charges levied against green, however, were the result of petty prejudice. In the West green started becoming visually associated with the devil and demonic creatures from the twelfth century, possibly as a result of the Crusades and the increasing antagonism between Christians and Muslims, for whom the color was sacred. In Shakespeare's day green costumes were considered bad luck onstage, a belief that persisted into the nineteenth century. In 1847, for example, a French author threatened to withdraw one of his works from the Comédie-Française because an actress was refusing to wear the green dress that the author had specified for the character she was to play.[10] Perhaps the final word on the irrational dislike of green should go to Wassily Kandinsky. "Absolute green," he wrote, "is the most anesthetizing color possible . . . similar to a fat cow, full of good health, lying down, rooted, capable only of ruminating and contemplating the world through its stupid, inexpressive eyes."[11]

Verdigris

Ever since the oil dried on the playfully elaborate artist's signature—*Johannes de eyck fuit hic*, "Jan van Eyck was here"—in 1434, the *Arnolfini Portrait* has intrigued and infuriated art lovers in equal measure.[1] In the painting a couple stand, bodies tilted toward the viewer. She wears a bottle-green gown with preposterously long sleeves; he has fishy eyes and looks a little like Vladimir Putin. Is the woman's left hand, loosely clasping her full skirts over the curve of her belly, the protective gesture of an expectant mother or simply an indication of fashionable indolence? Is this a newly married couple or an allegory of abuse? What is the meaning of the little dog? The gargoyles? The discarded clogs?

One thing is for sure: the dress is incontrovertible evidence of the couple's wealth. The trailing bag-sleeves were so decadent that Scottish peasants were expressly forbidden to wear them in the 1430s; the woolen cloth was further lined with the creamy fur of up to 2,000 squirrels.[2] The sap-green color too indicated money. A deep-dyed and even green was a difficult color to achieve. Generally it required two dye baths, first in woad and then in weld, a practice that was actually illegal for much of this period because of the medieval taboo on mixing colors. In January 1386 Hans Töllner, a third-generation dyer from Nuremberg, was denounced for doing precisely this; he was fined, banned from the dyeing profession, and exiled to Augsburg.[3] Van Eyck, using the finest of his brushes to paint the appliquéd Maltese cross decoration on the woman's trailing sleeves, would have felt equally frustrated. Like the dyers striving for the perfect green, artists too struggled to coax this fresh and beautiful color out of lousy raw materials; in this case, verdigris.

Verdigris is a naturally occurring carbonate that forms on copper and its alloy bronze when they are exposed to oxygen, water, carbon dioxide, or sulfur.[4] It is this green patina that forms on old copper pipes and roofs, and which gives the Statue of Liberty the blue-green color of the misty sea she often faces. It took the elements 30 years to turn Gustave Eiffel's second most famous structure from rosy copper to full green, far too long a time for an artist to wait for his pigment.[5] It is not known exactly when the technique for speeding the process along was discovered, but it is thought to have traveled westward with Arabic alchemy. Traces of this route can be discerned in the pigment's various names. *Verdigris* is French for "green from Greece," while its German name is *Grünspan*, or "Spanish green"—Georgius Agricola, a sixteenth-century scholar, wrote that it was brought up from Spain.[6] Similar to the manufacture of lead white [page 43], leaves of copper were placed in a pot with lye and vinegar or sour wine. The pots were then sealed and left for two weeks, after which the sheets were dried, and the green patina was scraped off, powdered, and formed into cakes with more sour wine, ready to be sold.[7]

As the green dress in the *Arnolfini Portrait* proves, verdigris could be used to spectacular effect, but it was fickle. The acids used to make it often attacked the surface on which it was used, nibbling through medieval illuminations of paper and parchment like a caterpillar munching through leaves. It also had a tendency to discolor and to react with other pigments. As Cennino Cennini lamented: "it is beautiful to the eye, but it does not last."[8] The truth of his words is evident in the works of everyone from Raphael to Tintoretto, where the greenery has withered to a shade approaching coffee. Even Paolo Veronese, a renowned master of the color green, was not immune.[9] (Perhaps such incidents were why he dreamed of "green pigments as good in quality as the reds.")[10]

Verdigris, continued.

The problem was exacerbated by the rise of oil paint in the fifteenth century. While verdigris is perfectly opaque in the egg-tempera medium, it becomes glassily transparent in oils, which often led to its being mixed with turpentine resin from pine trees to restore its opacity.[11] This made verdigris even more temperamental, and some began to worry that it should not be used with lead white, rendering it all but useless. Because there were so few alternatives, artists had little choice but to persevere, sandwiching their troublesome green between layers of varnish as a precaution and hoping for the best. For Van Eyck and his wealthy clients, however, it was clearly worth the risk.

Absinthe

In the waning decades of the nineteenth century a green menace harried Europe's citizens. Absinthe was made from a combination of plants and aromatics, including wormwood, aniseed, fennel, and wild marjoram, which were first bruised and then soaked in alcohol and distilled, creating a bitter, pear-colored liqueur. It was not an entirely new concoction: ancient Greeks and Romans had used similar recipes as an insect repellent and antiseptic. The modern version was also intended for medicinal use. Pierre Ordinaire, a well-known French physician living in Switzerland just after the French Revolution, created a take on the ancient recipe as a tonic for his patients.[1] It became commercially available at the turn of the century, but was still largely considered medicinal: French soldiers serving in Africa were given it to help ward off malaria.

Soon enough, though, people began to acquire a taste for it. At first, it was not so very different from any other aperitif, a small alcoholic drink taken before dinner, of which the French were inordinately fond. A measure would be placed in a glass, and then diluted with ice-cold water poured through a sugar cube, turning the whole thing milky pale.[2] The difference was in absinthe's visibility and, from the 1860s when producers began using cheaper grain alcohol, its explosive popularity. While at first it was associated with dissolute bohemians and artists like Vincent van Gogh, Paul Gauguin, Oscar Wilde, and Edgar Allan Poe, its appeal soon spread. By the 1870s a glass cost no more than 10 centimes, considerably less than wine, and absinthe accounted for 90 percent of aperitif consumption. In the latter half of the nineteenth century whole districts of Paris were said to smell faintly herbal between 5 and 6 p.m., a time that became known as *l'heure verte* ("the green hour"). In France consumption

Absinthe, continued.

increased from an average of 0.04 quarts per person in 1875 to 0.6 quarts in 1913.[3]

By this stage, absinthe had become a serious cause for concern, and not only in France, but also in Switzerland, where many people drank it, and Britain, where it was feared many soon would. This strange green drink, authorities felt, was poisoning the body-social, and a moral panic swiftly ensued. On May 4, 1868, the *Times* warned its readers that absinthe was threatening to "become as widespread in France and as injurious there as opium-eating is in China." This "emerald-tinted poison" was making "driveling idiots" out of those who were lucky enough to drink it and survive addiction and death. Worse still, more and more respectable people were dallying with it. "Literary men, professors, artists, actors, musicians, financiers, speculators, shopkeepers, even"—here one imagines readers' hands convulsively clutching their throats—women were becoming absinthe's "ardent lovers."[4]

In France doctors began to suspect that it was really a poisonous drug. "Absinthomania" was increasingly seen as a medical complaint quite distinct from mere alcoholism. People were reporting hallucinations and permanent insanity. To prove it, two scientists doused an unfortunate guinea pig with wormwood fumes (wormwood had quickly become the chief suspect of all absinthe's botanicals), whereupon he "became heavy and dull, and at last fell on his side, agitating his limbs convulsively, foaming at the mouth."[5] Dr. Valentin Magnan, an authority on insanity and the director of a Parisian asylum, theorized that madness brought on by absinthe—his experiments had been conducted on a dog—was responsible for a collapse in French culture.[6] In Switzerland the final straw came in 1905, when a man called Jean Lanfray killed his pregnant wife and two young daughters, Rose and

Blanche, after he had been drinking absinthe. The case was dubbed "the absinthe murder" and the drink was outlawed completely in Switzerland three years later. France followed suit at the outbreak of the First World War in August 1914, in a groundswell of popular patriotic fervor.

Subsequent tests have shown that much of the supposed proof of absinthe's inherently deleterious effects were nonsense. Wormwood does not cause hallucinations and madness. Although the spirit does contain thujone, which is poisonous in large quantities, the doses a person would need to consume mean that they would die of alcohol poisoning long before thujone overdose became a possibility. The real problem with absinthe is that it is very alcoholic, varying between 55 and 75 percent, and in the late nineteenth and early twentieth centuries Europe was experiencing widespread social upheaval of the kind that led many to become alcoholics. Jean Lanfray was typical. While it is true that he had started the day on which he murdered his family with two shots of absinthe, he had gone on to drink wine, brandy, and then more wine—he could not even remember committing his crime.[7] But this didn't matter. Absinthe, with its druglike pouring ritual, working-class and counterculture devotees, and suspicious, poison-green color, was the perfect scapegoat.

Emerald

It was Shakespeare who cemented the relationship between green and envy. With *The Merchant of Venice*, written in the late 1590s, he gave us "green-eyed jealousy"; in *Othello* (1603), he has Iago mention "the green-ey'd monster, which doth mock / The meat it feeds on." Prior to this, during the Middle Ages, when each deadly sin had a corresponding color, green had been twinned with avarice and yellow with envy.[1] Both human failings were the guiding principles in a recent saga concerning a vast green stone, the Bahia emerald.

Emeralds are a rare and fragile member of the beryl family, stained green with small deposits of the elements chromium or vanadium. The best-known sources are in Pakistan, India, Zambia, and parts of South America. Ancient Egyptians mined the gemstones from 1500 B.C., setting them in amulets and talismans, and they have been coveted ever since.

The Romans, believing green to be restful to the eyes because of its prominence in nature, pulverized emeralds to make expensive eye balms. The emperor Nero was particularly enamored with the gem. Not only did he have an extensive collection, he was also said to use a particularly large example as proto-sunglasses, watching gladiator fights through it so that he wouldn't be bothered by the glare of the sun.[2] When L. Frank Baum wrote *The Wonderful Wizard of Oz* in 1900, he used the precious stone as both the name and the building material for the city his heroine and her band of misfit friends are trying to reach. The Emerald City, at least at the beginning of the book, is a metaphor for the magical fulfillment of dreams: it lures the characters in because they all want something from it.

The Bahia was heaved from the beryllium-rich earth of northeastern Brazil by a prospector in 2001.

Stones from this area are generally not worth much; they tend to be cloudy and occluded and sell for, on average, less than $10. This one, however, was gargantuan. The whole lump weighed 840 pounds (roughly the same as a male polar bear) and was thought to contain a Kryptonite-green gem of 180,000 carats. In the years since its discovery the gemstone's vast size and value have done little to secure it a stable home. Housed in a warehouse in New Orleans in 2005, the Bahia narrowly escaped the flooding caused by Hurricane Katrina. It has allegedly been used in any number of fraudulent business dealings—a judge called one such scheme "despicable and reprehensible." It was listed on eBay in 2007 for a starting price of $18.9 million and a "buy-it-now" price of $75 million. Gullible potential buyers were regaled with a backstory that involved a journey through the jungle on a stretcher woven from vines and a double panther mauling.

At the time of writing the Bahia emerald is valued at around $400 million and is at the center of a California lawsuit. Around a dozen people claim to have bought the stone fair and square in the 15 years since it was discovered, including a dapper Mormon businessman; a man who says he purchased it for $60,000, only to be tricked into believing it was stolen; and several of the people who brought it over to California in the first place. An international row has been brewing too: Brazil claims that the stone should be repatriated.[3] The story of the Bahia emerald is, in short, a parable of avarice worthy of the Bard himself.

Kelly green

It is well known that the only people more proud of their Irish heritage than the Irish are the Americans of Irish descent. New York's St. Patrick's Day Parade, for example, proudly traces its lineage all the way back to March 17, 1762, 14 years before the Declaration of Independence. Every year, while the White House dyes the waters of its fountain the color of mulched leaves, hundreds of thousands gather to celebrate Ireland by drinking Guinness, wearing green, and trying out their rusty Irish accents. By contrast, Kelly green, one name given to the spring-grass color so many wear on St. Patrick's Day, is a rather recent invention, emerging only at the beginning of the twentieth century.[1]

Most people would, if asked, say the connection between the Irish and Kelly green has to do with St. Patrick. Everything known about the saint comes from the man himself: during his lifetime in the fifth century he wrote his *Confessio*, an account of his life in Latin, the first text written in Ireland to have survived. It begins simply: "My name is Patrick. I am a sinner, a simple country person, and the least of all believers."[2] His first acquaintance with the country of which he is now patron saint was not a happy one. He was born to a relatively wealthy Christian family in a place named Bannavem Taburniae—which was probably in England, although no one is quite sure—and was brought to Ireland as a slave after being captured by Irish raiders. In all he spent six years as a captive tending sheep, after which he escaped, returned home, and became a priest. Clearly he did not bear Ireland any ill will, because he soon returned as a missionary, converting much of the population, most famously using a shamrock to explain the idea of the trinity. He died sometime in the late fifth century, and was being celebrated as a saint by the seventh.

Strangely, though, the color he was most associated with until the middle of the eighteenth century was a shade of blue.[3]

The shift in Irish loyalty from St. Patrick's blue to green is convoluted. Responding to what they perceived as the anti-Catholic bias of William of Orange and the orange-wearing Protestants [page 96], Catholics wanted a symbolic color of their own. By this time the saint's lesson of the shamrock had become increasingly central to Irish Catholic identity. At the same time green had become associated with revolution when, on July 12, 1789, a young lawyer called Camille Desmoulins picked up a linden leaf in the middle of haranguing a Parisian crowd, stuck it in his hat, and invited patriots to do the same. Soon enough, the linden leaf had become a green cockade, and it might have been adopted as the symbol of the French Revolution had it not been remembered at the last minute that it was the color of the livery of the detested Count of Artois, Louis XVI's younger brother. By July 14, the green cockade had been eclipsed by the tricolor.[4] Nevertheless a green flag, sometimes bearing a golden harp, became the symbol of the fiery Irish Home Rule movement, which sought independence from Britain. In a deliberate snub, when the Prince of Wales visited Ireland in the spring of 1885, a green flag vied for space with the Union Jack.[5] In the end, the Irish decided to follow the French once more in the adoption of a tricolor flag. The green symbolized the Catholic nationalists, orange the Protestants, and white the peace it was hoped would reign between them.

Scheele's green

The island of St. Helena lies like a lost seed in the middle of the Atlantic, 1,200 miles west of Africa and 2,500 miles east of South America. It is so remote that it has, for the majority of its history, been uninhabited, serving only as a stop-off for ships to collect fresh water and repair their hulls. It was here that the British decreed that Napoleon should be sent in October 1815 after his defeat at Waterloo. And it was here too that he died, six years later. Although his physician had initially suspected stomach cancer, when Napoleon's body was exhumed in 1840 it was found to be curiously well preserved, a symptom of arsenic poisoning. A sample of his hair, tested in the twentieth century, was also found to contain abnormally high levels of the poison. Once it was discovered in the 1980s that the walls of his damp little room in St. Helena were papered with a verdant design containing Scheele's green, the rumor spread that the British had poisoned their difficult prisoner.

In 1775 Carl Wilhelm Scheele, a Swedish scientist, was studying the element arsenic when he came across the compound copper arsenite, a green that, though a slightly grubby pea shade, he immediately recognized as having commercial potential in an industry starved for green pigments and dyes.[1] It went into production almost immediately and the world fell in love with it. It was used to print fabrics and wallpapers; to color artificial flowers, paper, and dress fabrics; as an artists' pigment; and even for tinting confectionery. J. M. W. Turner, ever willing to try out the latest innovations, used it in an oil sketch of Guildford in 1805.[2] After a trip to Italy in 1845, Charles Dickens returned home seized with a passion to redecorate his whole house in the newly fashionable shade. (He was, luckily, dissuaded by his wife.)[3] By 1858 it was estimated that there were around

100 square miles of wallpaper dyed with copper arsenite greens in British homes, hotels, hospitals, and railway waiting rooms. And by 1863 the *Times* estimated that between 500 and 700 tons of Scheele's green were being made each year in Britain alone to satisfy the ballooning demand.

However, just as it seemed as if the appetite for greens could not be satiated, disturbing rumors and a string of suspicious deaths began to dull consumers' hunger. Over 18 months working as an artificial-flower maker, Matilda Scheurer rapidly sickened—her likely symptoms included nausea, vomiting, diarrhea, rashes, and listlessness—and finally died in November 1861 at age 19. In another case, a little girl had died after sucking the green powder from a bunch of artificial grapes.[4]

As more and more people succumbed after experiencing similar symptoms, doctors and scientists began conducting tests on all green consumables. An article in the *British Medical Journal* in 1871 noted that green wallpaper could be found in all manner of houses, "from the palace down to the navvy's hut"; a six-inch-square sample of such a paper was found to contain enough arsenic to poison two adults.[5] G. Owen Rees, a doctor at Guy's Hospital in London, became suspicious after a patient was apparently poisoned by some calico bed curtains. He did further tests in 1877 and found to his horror that "some muslin of a very beautiful pale green" used for dressmaking contained over 60 grains of an arsenic compound in every square yard. "Imagine, Sir," he wrote to the *Times*, "what the atmosphere of a ballroom must be where the agitation of skirts consequent on dancing must be constantly discharging arsenical poison."[6]

Scheele had known from the beginning that his eponymous pigment was poisonous: he said so in a letter

Scheele's green, continued.

to a friend in 1777, adding that his other principal concern was that someone else might get the credit for his discovery.[7] The head of the Zuber & Cie factory in Mulhouse wrote to a professor in 1870 to say that the pigment, "so beautiful and so brilliant," was now only being supplied in small quantities. "To want to prohibit all trace of arsenic in papers is to go too far," he continued, "and to hurt business unjustly and needlessly."[8] The public, it seemed, largely agreed, and no laws were ever passed banning its use. If this seems strange, it should be remembered that this was a world where arsenic and its dangers were accepted with more equanimity. Even after a mass poisoning in 1858, when a package of powdered white arsenic was mistaken for powdered sugar and added to a batch of peppermints in Bradford, it took a long time for people to come around to the idea of regulations and warning symbols.[9]

This more laissez-faire attitude to the poisonous substance was given some accidental backing by researchers at Italy's National Institute of Nuclear Physics in 2008. In order to finally settle the question of Napoleon's death, they tested other samples of hair from different stages of his life, and found that the levels of arsenic had remained relatively stable. They were, yes, very high by today's standards, but not at all unusual for his.[10]