sending small but regular consignments overseas to Europe. There, after a transatlantic journey of more than three thousand miles, the shriveled grains of cochineal—smaller than peppercorns, dry as blackened bone—were at last unloaded on the docks of the great Spanish port at Seville.

SIX

Cochineal on Trial

Famous for its flowering orange trees and filthy streets, Seville had been Spain's official transatlantic port since 1503. By decree, all New World voyages started and ended at the city, and all American commodities—including cochineal—were unloaded and registered there.

That the Spanish Crown desired an official port was not surprising, for centralization made it easier for royal officials to regulate and tax the American trade. Seville, however, was an unlikely center of oceangoing commerce. Twenty leagues inland from the Mediterranean, it was centered on the muddy, shallow Guadalquivir, a river notorious for its sandbars. Yet Seville, for all its navigational failings, offered a number of significant advantages not found in other ports with deeper harbors and better access to the Atlantic. Not only was it well protected from pirates, but its location in the grain-rich region of Andalusia made it ideal for provisioning ships, and it boasted some of the most sophisticated markets in all Spain.
Sophistication, indeed, was a keynote of Sevillian life. “Quien no ha visto Sevilla, no ha visto maravilla,” Spaniards said. “He who has not seen Seville, has not seen a wonder.” Captured from the Moors in 1248, the city was undoubtedly both Spanish and Catholic, yet everywhere it was marked by the complex imprint of five hundred years of Arab rule. Moorish tiles glorified the walls of the royal palace, Moorish fountains cooled the city’s walled courtyards, and Moorish rhythms echoed in the region’s anguished music. Even Seville’s cathedral, seat of the Spanish Inquisition, owed much to Moorish influence, for its bell tower, the famous Giralda, had once been the minaret of Muslim Seville’s great mosque.

After Seville was named Spain’s official New World port, its cosmopolitan atmosphere became even more pronounced. Foreigners and Spaniards alike poured into the city, hoping to become involved in the greatest economic venture of their time. Dubbed the “new Babylonia,” Seville became the decadent capital of a new golden age. In its streets and alongside its docks, tradesmen, sailors, and soldiers of fortune mingled with vagabonds, prostitutes, and assassins. Beggars roamed the city in inordinate numbers, feigning disease or madness to earn their bread. The city also played host to a wide and varied brotherhood of thieves—including the coriabolos, who stole purses; the capeadores, who stole cloaks; and the devotos, who (oddly enough) went after religious images.

But it was not only thieves who gave Seville its reputation for corruption. Its womenfolk, too, were a cause for concern, for as Sevillian men emigrated to the New World in droves, their wives, mothers, and sisters were left to manage affairs in their absence. Many of these women took advantage of their new freedom to make investments, buy property, and run businesses. By 1525, Seville was said to be a city “in the hands of women”—which the conventional considered a sure sign of moral decline. Yet the offenses of Seville’s women paled beside those of its merchants. To the archbishop’s indignation, they insisted on doing business in the shadow of the city’s cathedral; on rainy days they met in the nave of the cathedral itself. In 1598, they would move to a new building, built specifically for their trading, but until then the moneychangers remained in the temple, to the great consternation of the pious.

Even the pious, however, were drawn into the rhythms of Seville’s commercial life—rhythms that were in large part controlled by the ebb and flow of traffic along the Guadalquivir. During the first half of the sixteenth century, there was no regular schedule of fleets, but each time a convoy of ships prepared for a voyage to the New World, the city hummed with activity. Shipwrights made repairs, captains searched for crew members, and merchants sent their agents scurrying to find provisions and cargoes for the journey. Salt cod, ship’s biscuit, wine, oil, rope, gunpowder, ironware, paper, shoes, wax, cheese, bolts of cloth—stevedores loaded all these and more aboard the departing ships. Once the vessels had departed, the city’s pulse returned to normal, only to quicken again when the ships returned from the New World, laden with exotic cargo.

Yet if Sevillians dreamed of New World treasure, the actual returns were disappointing during the early decades of empire. Although the conquistadors welcomed Spanish vessels and the goods they brought, they were not often inclined to restock the ships with marketable American commodities and send them back across the Atlantic. Even worse, from the merchants’ point of view, was the conquistadors’ habit of cannibalizing their ships. Because ship timber, iron fittings, and cannon were much in demand in the New World, many a Spanish vessel reached America only to be sold for scrap after it had arrived. Desperate for replacements, Sevillian merchants pressed clapped-out galleons into service. Overloaded and undermanned, they foundered at sea, producing staggering losses for all concerned. It was only in the 1540s that this shipping crisis eased, allowing the riches of America to freely pour into Seville.

Silver from newly discovered mines—especially the immense
and legendary mine at Potosí—made up the lion’s share of the American riches that landed in Seville. But the Spanish colonies produced other exports, too, including sugar, pearls, indigo, hides, tallow, tobacco, and cochineal.

Tobacco, of course, was a somewhat puzzling commodity. New to Europe, it had no merchants who were expert in its qualities, nor did it have established routes of commerce; consequently it took time to achieve wide popularity. Cochineal, by contrast, seems to have been rapidly accepted by Seville’s merchants, for their city had long been a center for the trade of kermes and other red dyestuffs. No doubt relying on the connections they had already developed in the business, they quickly put cochineal into the hands of Europe’s dyers.

The first European dyers to work with cochineal were almost certainly Spanish, but if Spain’s dyers had hoped to keep the new dyestuff to themselves, those hopes were soon dashed. Although cities like Segovia, Toledo, and Granada produced some fine fabrics, the Spanish textile industry was continually hampered by a lack of skilled workers. Trying to make the best of a bad situation, the Crown commandeered beggars and vagrants as wool shop workers, but the problem of skilled labor persisted, and prices for Spanish textiles remained high—a situation that would only worsen as inflation sent Spanish prices skyrocketing after 1550. Hamstrung by the labor shortage and by a national economy in crisis, Spanish cloth workers could make only limited use of cochineal. Instead, the merchants of Seville took to selling cochineal abroad, especially to Italians, who were always on the lookout for a new and promising red dyestuff.

To be sure, some dyers balked at buying an untried commodity. In 1543, for instance, the dyers’ guild of Genoa scorned the new “mixture or composition that is called Indian kermes,” ruling that it could not be used to dye silk. Yet many other dyers were eager to experiment with cochineal. Like the merchants of New Spain, they understood the value of innovation; indeed, their cutthroat profession demanded it. In skilful hands, cochineal might yield profitable secrets, and no dyer wanted his rivals to steal a march on him. Across Italy, dyers quietly began to subject the “kermes and powder of Spain” to rigorous trials.

One of the earliest dyers to test cochineal’s properties was a Tuscan by the name of Lapo da Diacceto, who applied cochineal dyes to silk in the early 1540s, with vivid and striking results. Similar experiments in Mexico in 1537 had failed to elicit much response from the conquistadors, but in Italy, where luxury textile production was considered a matter of the utmost state importance, the reaction was immediate and powerful. The most formidable man in Tuscany, Cosimo the Great—duke of Florence and head of the Medici family—began the dyer’s sponsor. Da Diacceto continued with his experiments in secret, protected by the Medici name.

Outside the Medici domains, other Italian dyers were hot on his heels, including the Venetians. Since Venetian merchants dominated the trade in kermes reds, and since Venetian dyers were famous for the scarlet cloth made with those reds, the city had every reason to look askance at any dyestuff that might threaten the status quo. But Venetian merchants and dyers had not achieved their renown by ignoring new technologies. Having heard rumors of cochineal’s great affinity for silk, they wished to see for themselves whether the American dyestuff could yield a color equal to their own Venetian scarlet.

In February 1543, an enterprising silk merchant and a distinguished citizen presented three samples of cochineal to the Venetian silk guild. Each sample had a different name—*uchimillia*, *cochimeia*, and *panucho*—possibly indicating slight variations in the place of origin. It was also true, however, that in 1543 cochineal was too new a commodity in Europe to have a settled name. Only later in the century would the term for the dyestuff
be firmly established as *grana cochinilla*, or cochineal.* Despite the bewildering profusion of names, the two men attested that all three kinds of *grana* had been “grown in the Indies of the Emperor’s Caesarian Majesty,” Charles V. They wished the guild to test them, “to see their good quality, if they are really kermes or not.”

Their request was straightforward enough, since it was standard practice for Venetian textile guilds—like top guilds elsewhere—to examine and regulate new dyestuffs, new suppliers, and new dyeing techniques. In the case of cochineal, however, the silk guild acted with uncommon speed, perhaps because the Mexican dyestuff was already regarded as a commodity of unusual importance. That same day guild officials gave a master dyer three skeins of silk, to be prepared for dyeing by the following Monday, when the trial would officially commence. In the meantime, they left the cochineal to soak and soften in three basins of water, which were placed under lock and key in a cabinet in the guildhall.

Three days later, on Monday, February 12, the trial began. Six master dyers—including the dyer who had prepared the three skeins of silk—came to the guildhall, where they applied a different sample of cochineal to each skein. Once the skeins dried, the dyers compared them to a reel of the highest-quality crimson silk, dyed in the traditional way. Cutting threads from each of the samples, they placed them “over the fire,” in order to more fully assess their characteristics. When all this was done, the master dyers attested under oath that the three cochineal samples had produced a dye as good as the best traditional kermes reds.

*The exact origins of the term *coccinilla* remain a mystery. One sixteenth-century Spaniard suggested that it was derived from the Latin word *coccus*, meaning “scarlet dye”; other scholars have speculated that it comes from the Latin *coccineus*, meaning “scarlet-colored.” In Spanish, *coccinilla* literally means “little pig,” and the term is applied not only to cochineal itself but to a crustacean that cochineal resembles, the woodlouse.

Their statements, filed in guild archives along with the dyed silk and cochineal samples, were based solely on what Venetian artisans and guild officials could see with the naked eye. Yet in the twentieth century, when it finally became possible to analyze the structure of the kermes and cochineal dyes at the molecular level, scientists would reach similar conclusions. To this day the exact composition of these highly complex dyes is disputed, but chemists agree that their primary dyeing agents are closely related. The color of oak-kermes, for example, is produced by kermesic and flavo-kermesic acids, both of which have a chemical structure similar to that of cochineal’s chief ingredient, carminic acid; trace amounts of kermesic acid are found in cochineal dye, too. St. John’s blood, which contains a mixture of kermesic and carminic acids, is an even closer match for cochineal. The closest match of all is Armenian red, whose chemical composition is almost identical with that of cochineal dye.

The fact that cochineal most closely resembles St. John’s blood and Armenian red is important, for Renaissance dyers seem to have set special store by these reds. Their high carminic acid content seems to have produced deeper and more lustrous reds than those produced by kermesic acid, especially on silk, the most luxurious of all fibers.

But cochineal had three advantages that St. John’s blood and Armenian red lacked. First, cochineal insects produced their camminic acid with far fewer lipids than did the plump little Armenian insects, whose fat melted in the dye-pot and sometimes coated the threads of silk, preventing the fibers from fully absorbing the dye. Second, cochineal could be more efficiently

*According to the German dye specialist Harald Böhmert, Armenian red insects contain up to 50 percent lipids, an unusually high figure that has produced some startling results in the laboratory. Having located and harvested some of the Armenian insects in 1990, he processed them by cooking them in a lab oven. “This brutal treatment,” he wrote, “produced a pleasant odor of fresh roast throughout the department and down the hall.”
produced than either St. John’s blood or the Armenian dyestuff, and it could be harvested several times a year. Third—and most important—cochineal yielded a far more powerful dye than any of the Old World reds. Though roughly similar in cost, ounce for ounce it was ten times more potent than oak-kermes and St. John’s blood. It produced up to thirty times as much dye per ounce as Armenian red—a fact which must surely have caused dyers to marvel.

Cochineal, in other words, was the closest thing Europe had ever seen to a perfect red. Besides producing striking scarlets and crimsons, it could be made to yield soft pinks and roses, which appeared very fragile but which were in fact very fast. Within a few years, top artisans in Venice, Milan, Florence, Lucca, and Antwerp were said to be using it daily, incorporating the dyestuff into new secret formulas which they applied to rich velvet, sleek satin, and crisp taffeta. Soon even the dyers of Genoa lost their distaste for the “Indian kermes.” Worried that they were losing the business of customers who wanted cochineal, they legalized its use in 1550.

Not everyone, however, could be persuaded to join the cochineal camp. Some Frenchmen called on their compatriots to reject the dyestuff, arguing that it was a wasteful foreign luxury that depleted the country’s store of bullion; they also worried it would destroy the market for French madder. In Venice, too, many merchants resisted the new commodity, fearing the damage it would do to the city’s long-established trade in Old World kermes reds. Largely due to their opposition, the Venetian government forbade the use of cochineal on wool in the 1550s and 1560s. But such rules had little effect. To dyers, results meant far more than government rulings, and the results produced by cochineal were second to none.

By the 1570s, even the dyestuff’s enemies were forced to admit that the cochineal business had become one of the most dynamic enterprises in Europe. Large stocks of cochineal could be found not only in Seville but in Rouen and Antwerp as well, and lively markets also existed in dozens of other European cities, including Genoa, Florence, Marseilles, Nantes, and Lyon. Before the century was out, even Venice had capitulated to cochineal, and Venetian galleys laden with the dyestuff could be seen on the Adriatic. The amount of cochineal arriving in Seville each year—the key determinant of cochineal’s price—became a matter for international speculation among merchants, bankers, and high-ranking diplomats.

Further proof of cochineal’s importance in European markets was the appearance of cartels devoted tocornering the market in the dyestuff. This was worrisome enough on a regional level, but in 1585 two merchant families—the Capponis of Florence and the Maluendas of Burgos—together succeeded in creating a cochineal cartel that spanned most of Europe. Like most maneuvers in the dye trade, their cartel began as a covert operation. Having surreptitiously learned that the annual fleet had left New Spain with an unusually low amount of cochineal, the two firms sent out express couriers ordering their agents in Seville, Italy, France, and Flanders to quietly snap up every ounce of the dyestuff they could find. After these agents had secured most of Europe’s existing stock of cochineal, as well as a large proportion of the incoming shipment, the Capponis and Maluendas substantially raised the asking price for the dyestuff. At first artisans and lesser merchants balked at the cost, but those who depended on cochineal for their livelihood—and who had enough money to meet the price—eventually gave in. Until the next harvest of cochineal arrived in 1586, European cloth makers remained at the mercy of the Capponis and Maluendas, who profited greatly from their monopoly.

What made the Capponi-Maluenda cartel so successful was the fact that cochineal had become indispensable to the production of high-quality fabric. As early as 1550, many fashionable Europeans were insisting that their red cloth be made with cochineal. Demand grew rapidly over the next few decades, mak-
ing the dyestuff’s conquest unusually swift and complete: by 1580, cochineal had driven the traditional kermes reds to the fringes of the European textile market. The priest’s red velvet chasuble, the dandy’s red satin sleeves, the nobleman’s red silken draperies, and the countess’s red brocade skirts—all were now colored with cochineal.

The intensity of Europe’s response to cochineal is all the more remarkable given the rise of black as a fashionable color in the sixteenth century—a somber trend that owed a great deal to the emperor who claimed the land in which cochineal was produced. On his father’s side, Charles V was a Burgundian, and it was in Burgundy that black had first made its appearance as chic court garb. In the fifteenth century, the duke of Burgundy had taken to wearing black in order to set himself apart from his colorful courtiers; to ensure that there was no confusion about his status, he had worn only the finest and most expensive cloth. Inspired by this example, Charles also dressed for most of his reign in fine black garments, which he paired with a stiff white neck ruff. He may also have felt that this costume reflected his grave religious responsibilities as defender of the Catholic faith.

As Europe’s greatest monarch, Charles was the man of the hour. Whatever he said or did was worth noting, and once noted, worth imitating. Soon black suits and white ruffs—the “Spanish fashion”—had been adopted not only by Spanish grandees but by trendsetting aristocrats across the Continent. Other neutrals and muted colors also became fashionable, a change that can clearly be traced in the wardrobe accounts of England’s Elizabeth I. Daughter of the peacock-bright Henry VIII, she wore red and crimson in her youth, but after she ascended the throne in 1558, she dressed primarily in white, black, and gold, as well as subdued colors such as peach, ash, and tawny.

Yet despite these changes in fashion, the European market for high-quality red dyestuffs remained substantial. This was not only because they were sometimes used, with other dyes, to make the finest grades of black cloth, but because red itself remained extremely popular among the highest echelons of European society. For all its cachet, black and other neutrals were apt to be confused, at least at a distance, with the clothing of the poor and penitential. To avoid such embarrassment, some aristocrats, particularly women, continued to clad their entire persons in scarlet and crimson. Other elites conveyed a sense of majesty by combining their black-and-white garb with a splash of these valuable reds.

Among the many people who enhanced their black with red was Charles V, as a famous 1548 portrait by Titian, the greatest colorist of his age, demonstrates (see fig. 5). In the painting, which commemorated the emperor’s victory over the Protestants at Mühlberg, red and black are everywhere evident. Charles’s black-and-gold armor is set off by a magnificent red plume, red scarf, and red sash; his dark warhorse is bedecked with a red plume and a red-and-gold saddle cloth; Charles holds the horse in check with red reins. Even today, the medley of red and gold and black conveys the impression of great power and wealth, all the more since the portrait is life-size. Charles liked the painting so much that he paid Titian the princely sum of a thousand gold crowns for his work.

Other monarchs also found red a perfect foil for their black-and-white ensembles. Elizabeth I, for example, sometimes went so far as to dress all her ladies-in-waiting in red, the better to set off her own black-and-white gowns. For similar reasons, she dressed her servants in woolen scarlet livery—a fashion that influenced rulers and would-be rulers for centuries afterward. Even in the

*Among those who wore scarlet livery was William Shakespeare, who like other royal actors was given “scarlet red cloth: 4 and half yards” to make his official costume for the coronation of Elizabeth’s successor, James I.
A Perfect Red

democratic United States of America, George Washington and other prominent leaders favored scarlet livery for their servants. In Elizabethan England, courtiers who vied for the queen's attention took to wearing red satin and velvet; gentlemen who truly wished to be au courant dyed their beards to match.

Red backgrounds, too, were favored by the great. When Charles's chief rival, Francis I of France, posed for an early royal portrait in a costume of black, white, and gold, an intricately brocaded crimson backdrop enhanced his kingly air. Taking a page from the same book, black-clad noblemen often had themselves painted against scarlet draperies—a code for wealth that can be seen to especially fine advantage in the paintings of Anthony Van Dyck, whose billowing scarlet backdrops sometimes threatened to overwhelm his human subjects. Often the extravagant draperies were an illusion; only the wealthiest gentlemen could afford to be so lavish with such expensive fabrics. But to the relief of men of more straightforward means, Van Dyck, like many other painters, kept stock draperies in his studio, which allowed sitters to appear richer than they in fact were.

Aristocrats who could afford luxury in real life surrounded themselves with scarlet and crimson tapestries, curtains, and cushions, which meant that the residences of Renaissance men in black were often a riot of color. Sir William Cecil, Queen Elizabeth's secretary of state, for example, may have followed the sober Spanish fashion in his dress, but at home he slept in a Jacobean bed flamboyantly hung with crimson velvet.

Even when traveling, aristocrats often enveloped themselves in red. The prince of Eboli, an influential confidant of Charles's son Philip, rode in a carriage upholstered in glowing cochineal-dyed satin, behind horses said to be the finest in Spain. When the countess of Carlisle, wife of England's ambassador to Russia, entered Moscow in 1663, she did so in a carriage upholstered in crimson velvet, accompanied by trumpeters, drummers, and two hundred sleighs.

Cochineal on Trial

If aristocrats liked to wrap themselves in rich red trappings, so too did less exalted individuals, including merchants and lawyers. Among those who succumbed to red's lure was the wily-eyed Venetian art merchant Jacopo Strada (fig. 6). In a portrait painted by Titian in 1568, Strada wears a black doublet with shining rose-colored silk sleeves, a sartorial advertisement of financial success and consequent social advancement. Although cochineal imports had helped make it possible for Strada and other prosperous men of the mercantile class to afford more red cloth than ever before, high-quality red textiles were still far from common, and they conferred prestige on those who wore them.

For some merchants, cochineal-dyed cloth was a means not only of displaying wealth but of acquiring it, too. Most of the trade in cochineal-dyed textiles took place within the boundaries of Europe, but European merchants also exported top-quality cochineal-dyed woolens, in limited quantities, to the Middle East, India, and the Americas. Cochineal-dyed cloth was probably carried to Africa as well, where red fabrics were a prized item of exchange in the slave trade, worth as much as a man's liberty or even his life.

The Bulk of the Cochineal That Arrived in Europe was used as a textile dye, but the dried insects came to be employed for other purposes as well. Like the ancient Mexicans, Europeans saw cosmetic applications for cochineal and made an art of applying it to their faces. In Elizabethan England, the startling contrast of vivid cochineal-stained lips and pallid white cheeks, coated with lead powder, was considered the height of beauty.

Another aesthetic practice that Europeans had in common with the ancient Mexicans was the use of cochineal as an artists' pigment. In Europe, cochineal was usually used as an ingredient
for crimson lake—*lake* being the general term for any pigment made by attaching colorless inorganic compounds to translucent dyes, enabling the dyes to be used in painting.

Red lakes were also made with madder, lac, and various types of kermes. Only recently have museum conservationists discovered reliable ways of distinguishing which dyestuff was used in a given work of art. Although many paintings have yet to be tested, and others have produced equivocal results, early analysis indicates that cochineal was much more slowly adopted by painters than by dyers. Largely ignored for several decades, cochineal lakes finally came into their own in the late 1500s and 1600s, finding a place on the palettes of masters like Tintoretto, Vermeer, Rembrandt, Rubens, and Van Dyck. Velázquez and other Spanish artists are also thought to have used them. In later centuries, cochineal lakes would also appear in the works of, among others, Canaletto, La Tour, Gainsborough, Seurat, and J. M. W. Turner.

To make cochineal lakes, painters sometimes started with shearings from cochineal-dyed textiles, then boiled them in lye and added alum to extract the red coloring. A stronger and clearer red could be obtained by starting with the raw pigment itself. "Buy . . . some good Cochinele, about half an ounce will do," counseled one early art manual, which then advised painters to grind the insects into "fine Poudre, then put to them as many Drops of the Tartar Lye as will just wet it, and make it give forth its Colour." After adding water, the painters were to "take a bit of Allum, and with a Knife scrape very finely a very little of it into the Tincture . . . [to] make it a delicate Crimson." The whole mixture was then strained into a clean pot and used quickly, "for this is a Colour that always looks most Noble when soon made use of, for it will decay if it stand long."

As this last warning suggests, cochineal paints were not nearly as durable as cochineal textile dyes. When made with a sufficient proportion of dye to fixative medium, cochineal lakes were fairly fast in oil paintings, but like all lakes they had a tendency to fade with exposure to light. In high-quality paints, this process could take centuries; in poor-quality ones, the red coloring might fade in a matter of months. Used as a watercolor paint, cochineal was even more transient, with a loss of color evident in a few days or even a few hours. Aware of these limitations, some artists painstakingly sought out the very best lake pigments or more often manufactured them themselves, according to their own exacting standards. Their diligence frequently paid long-term dividends; the cochineal lake that Rembrandt used in *The Jewish Bride*, for example, has given added depth and beauty to the bride's red skirt for over three hundred years (see fig. 7). A less careful artist—Turner is the most famous example—could see his cochineal-streaked sunsets fade before his eyes.

Artists who made their own paints were often advised to procure cochineal from their local "Drugist" or pharmacy, advice that highlights the fact that Europeans also used cochineal as a medicine. This practice, too, was at least partly borrowed from ancient Mexico. Francisco Hernández, a sixteenth-century physician who had traveled to New Spain, recommended in *De materia medica*, his handbook of American medicines, that Europeans use the dyestuff in the Mexican manner: "Dissolved in vinegar and applied in the form of a poultice, it cures wounds, strengthens the heart, head and stomach, and cleans the teeth extraordinarily well."

If Hernández's readers were inclined to follow this Mexican prescription, it was probably because Europeans themselves had a long tradition of using dyes as medicines. In Latin—the indispensable language of Renaissance medical professionals—the word *pigmentum* signified both a pigment and a drug, and many substances were employed in both fashions, including various types of kermes reds. Cochineal thus slotted neatly into the European pharmacopoeia and remained there for centuries.

European medical indications for cochineal were many and varied—and like dyers, most apothecaries had their own secret formulas for its use. In addition to the applications extolled by
Hernández, cochineal was considered an antidepressant: Gerard's *Herball*, a widely consulted medical text, claimed in the seventeenth century that it was "good against melancholy diseases, vaune imaginations, sighings, griefes, and sorrow with manifest cause, for that it purgeth away melancholy humors." Cochineal was also praised for producing sweat, preventing infection, and cooling fevers, which may explain why the dyestuff was given to England's Charles II—along with cinnamon, marshmallow leaves, violets, rock salt, and antimony—in a cinema as he lay on his deathbed in 1680. Desperate remedies were in fashion; before the king expired, doctors also applied pitch and pigeon dung to his feet.

An eighteenth-century English manual, *The Country Housewife's Family Companion*, also prescribed cochineal for jaundice. The book directed sufferers to mix the dyestuff with cream of tartar and Venetian soap, "and take half a dram three times a day"—a foul-tasting potion, no doubt, but preferable to the alternative, which was to swallow "nine live lice every morning for a week, in a little ale." A more palatable cochineal remedy was described by Lorenzo Da Ponte, the librettist for Mozart's *Le nozze di Figaro, Don Giovanni*, and *Cosi fan tutte*. En route to Bologna, his carriage overturned, and the injured Da Ponte was carried half-dead to a nearby inn. Tucked into bed by the innkeeper's wife, he was brought a "drink of excellent Chianti" and "an exquisite cochineal liqueur of prodigious strength made only in Florence." So powerful was this liqueur, Da Ponte claimed, that in less than three hours he was ready to continue his journey.

Cochineal was used in other foods and drinks as well, though not always for medicinal purposes. In early-nineteenth-century England, the dyestuff was frequently used by bakers "to make the apple and the gooseberry outblush the cherry and the plum." Yet the idea that cochineal had medical properties endured, at least in some circles. During the same era, cochineal was added to the meals of mental patients in the United States, ostensibly to calm them.

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**For all that cochineal proved a useful addition to European dressing tables, paintboxes, and medicine cabinets, it was primarily the textile industry that fueled trade in the dyestuff. Eventually, that trade crisscrossed the world. Cochineal traveled to Constantinople in Venetian galleys; from there, merchants sent it on to Turkey and the Caspian region, where the dyestuff was greatly admired and used to make intricate textiles and carpets. Merchants from France, Spain, Holland, and Flanders also helped funnel cochineal to the East, and as a result of their efforts artisans in Persia and Cairo began using it. Cochineal became popular, too, among the people of the Philippines, who received their cochineal courtesy of the Spanish galleons that had opened up trade between Acapulco and Manila in the 1570s. From the Philippines, cochineal eventually found its way to China, where it became known as *yang hong*, "foreign red."

Year by year, cochineal was sweeping the world, an early instance of truly global trade. So popular was the dyestuff that in *Candide*, Voltaire satirically pointed to cochineal as proof that humans were living in the best of all possible worlds. When innocent *Candide* questions how syphilis could exist in a perfect world, Dr. Pangloss explains that the dreaded disease ultimately works toward the greater good. Syphilis, after all, comes from America, and without America, Pangloss triumphantly concludes, "we should not have chocolate and cochineal."

If few of Voltaire's readers were quite so optimistic as Pangloss, it was nevertheless true that to most Europeans cochineal seemed a gift of nature, a perfect commodity that God had intended them to possess and use to their own advantage. It never crossed their minds that the dyestuff might actually be a cultural legacy—the result of the ancient Mexicans' long and successful effort to cultivate a strain of cochineal that would produce a perfect red. Not until the early 1900s did biologists, informed
by evolutionary theory, begin to suspect how great a role the ancient Mexicans had played in the creation of *Dactylopius coccus*.

Renaissance Europeans, who neither knew nor cared about these cultural origins, merely concerned themselves with the fact that cochineal had no equal. Yet whether Europeans acknowledged it or not, cochineal's global triumph owed less to their efforts than to thousands of years of Mexican ingenuity. And as European merchants struggled to meet the world's burgeoning demand for the dyestuff, they soon found themselves relying once again on the initiative of Mexico's indigenous people.

**SEVEN**

**Legacies**

Amid the Europeans who saw cochineal as an object of desire was Philip II, Charles V's son and heir. Cochneal, for Philip, meant money in the bank—and money was something that Philip, like his father before him, desperately needed.

Quiet and conscientious, Philip had come to the throne in the shadow of his father's financial disgrace. Although Charles had managed to conceal the extent of his debts for decades, toward the end of his reign his income was mortgaged away a year in advance, and he was regularly confiscating private silver remittances from the New World in order to pay his debts. He ostensibly paid for the silver with government bonds, but his vast military expenditures, financed by bankers' loans that ran to millions of ducats every year, ultimately proved more than his empire could bear. In 1552, when Charles suffered a crushing defeat at the hands of the Protestant princes of Germany, his bankers began to call in their loans. Hard-pressed, Charles