

The 103 Years of M.E. Chevreul

in culture, history, and science



1786 Michel Eugène Chevreul born on August 31, in Angers, France.

1787 The United States Constitution is submitted for approval to the thirteen original states. ♣ King Louis XVI issues the Edict of Versailles, giving civil rights and the ability to practice religion openly to non-Catholics. ♣ Antoine Lavoisier, the father of French chemistry, asserts the presence of a previously unknown chemical element he calls *silicon*.

1788 A poor harvest in France leads to widespread hunger the following year. ♣ King George III becomes obviously insane, leading to a quarter-century of instability in the British government. ♣ *The Times* of London publishes its first edition.

1789 George Washington elected first president of the United States. ♣ In Paris, the storming of the Bastille prison marks the beginning of the French Revolution. ♣ The French Constituent Assembly issues the *Declaration of the Rights of Man and of the Citizen*, adopting many of the human-rights reforms of the American Revolution. ♣ Physician Joseph-Ignace Guillotin, who personally opposes the death penalty, proposes a new device that he says will make executions more humane.

1790 The revolutionary government divides the country into 83 départements, hoping to reduce regional loyalties. All clergy become employees of the state.

1791 King Louis XVI accepts a constitutional monarchy and pledges to uphold its laws. ♣ Franz Joseph Haydn's "Surprise" symphony premieres in London. ♣ Death of Wolfgang Amadeus Mozart at age 35. ♣ Late in the year the king and his family attempt to flee France, disguised as servants. They are captured the following day. ♣ President Washington commissions French-born architect Pierre Charles L'Enfant to plan the design of a new American capital city.

1792 The French monarchy is officially abolished; Louis XVI and his wife Marie Antoinette remain under house arrest. ♣ France declares war on Austria, which then allies with Brit-

ain, Portugal, Prussia, and Spain; this is the War of the First Coalition. ♣ A French captain, Claude Joseph Rouget de Lisle, composes what he calls *The War Song of the Army of the Rhine*; it shortly becomes known as *La Marseillaise*, and remains the French national anthem today.

1793 Citizen Louis Capet, formerly known as Louis XVI, is guillotined in January. ♣ Fall marks the start of the Reign of Terror: in nine months the French revolutionary government, under the direction of Maximilien Robespierre and Louis Antoine de Saint-Just, executes more than 40,000 people, including, in October, "the widow Capet"—Marie Antoinette. ♣ Painter Jacques-Louis David, one of the most radical members of the government, forces the closure of the *Académie royale de peinture et de sculpture*.

1794 The guillotine works non-stop, claiming the revolutionary hero Georges Danton and the great chemist Lavoisier. In July, the Reign of Terror ends as a different faction takes over the government; Robespierre and Saint-Just are guillotined the following day. ♣ French troops seize parts of modern Belgium, Italy, and Spain.

1795 Attempts to oust the government by force are repulsed by troops led by Napoleon Bonaparte, who, at 26, becomes the most powerful man in France.

1796 Napoleon's armies conquer much of Italy. ♣ Edward Jenner introduces smallpox vaccination in England.

1797 Austria surrenders; Belgium, parts of Italy, and the German Rhineland are ceded to France. The Treaty of Campo Fornio leaves Great Britain as France's only active enemy. ♣ Composer Franz Schubert born in Vienna.

1798 The War of the Second Coalition: Britain, Austria, and Russia are again at war against France. ♣ After several years of cool relations over the U.S. government's insistence that the French revolution cancelled any debts that it had previously owed the monarchy, an undeclared naval war breaks out between the two powers, mostly confined to the Caribbean.

1799 A soldier in the invading French army discovers the Rosetta Stone in Egypt. ♣ Napoleon stages a coup d'état in Paris and becomes First Consul of the Republic. ♣ France introduces the metric system.

1800 France and the U.S. settle their differences. ♣ Napoleon invades Italy again. ♣ Chevreul enters Central School of Angers; during his three-year stay there he will win first prizes in Latin, Greek, chemistry, and mineralogy.

1801 Russia abandons the war; Austria settles, confirming France's previous territorial gains and also giving her part of present-day Tuscany. ♣ Great Britain and Ireland merge to form the United Kingdom. ♣ France's surrender to the British and Ottomans in Egypt lets the Rosetta Stone change hands; since then it has resided in the British Museum in London. ♣ Napoleon signs concordat with the Vatican.

1802 The Treaty of Amiens brings peace to France and Britain—for all of fourteen months.

1803 The Louisiana Purchase: France, desperate for money, sells its North American possessions, doubling the size of the United States. ♣ Composer Hector Berlioz born in La Côte-Saint-André, France. ♣ Chevreul relocates to Paris as a chemical assistant; his success leads to his appointment as a very young assistant professor at the Collège de France. ♣ The United Kingdom again declares war on France.

1804 Napoleon crowns himself Emperor of the French, in a ceremony at Notre-Dame attended by Pope Pius VII. ♣ When Beethoven, preparing for the premiere of his Eroica Symphony, hears of the coronation, he flies into a rage and erases the symphony's original dedication to Napoleon, whom he had previously regarded as a revolutionary hero. ♣ World population reaches one billion.

1805 The war of the Third Coalition: the Battle of Trafalgar establishes Britain as the monarch of the seas, but Napoleon defeats the Russian army at the Battle of Austerlitz.

1806 Napoleon dissolves the Holy Roman Empire and creates the Confederation of the Rhine out of sixteen German-speaking puppet states. ♣ Chevreul's first academic article, a review of fossils found in France, appears in the *Annales de Chemie*.

1807 The War of the Fourth Coalition: Prussia, Russia, Sweden, and the U.K. war on France, but Napoleon's defeat of the Russians at the

Battle of Friedland ends hostilities. ♣ The U.K. outlaws the slave trade. ♣ Chevreul begins work on dyes, extracting a red from Brazil wood, and experimenting with indigo. ♣ A new war breaks out on the Iberian peninsula, with Portugal, Spain, and the U.K. allied against France.

1808 Chevreul's first article about color, "Experiments with Indigo." ♣ In Germany, Johann Wolfgang von Goethe publishes the first part of his *Faust*.

1809 The War of the Fifth Coalition: Austria and the U.K. oppose France. Napoleon routs the Austrians and occupies Vienna. ♣ Russia conquers Finland. ♣ Birth year of a startling number of great names: Frédéric Chopin, Charles Darwin, W.E. Gladstone, Abraham Lincoln, Felix Mendelssohn, Edgar Allan Poe, Robert Schumann, and Alfred Tennyson.

1810 In Germany, Goethe publishes *Zur Farbenlehre*, a strong attack on Newtonian theories of color, with much material that anticipates what Chevreul would later write about simultaneous contrast. There is no evidence that Chevreul ever heard of Goethe's book before writing the work you read today. ♣ Chevreul appointed as a naturalist in the Natural History Museum.

1811 Chevreul turns his research toward human health, especially diabetes. He publishes papers analyzing the excrement of various species to learn about the role of uric acid. This leads him to a thorough study of animal fats.

1812 The British navy, desperate for manpower, makes a practice of stopping American ships and impressing their sailors into British service; the two nations go to war. ♣ Napoleon, now allied with Austria and Prussia, invades Russia, where, after taking Moscow, his army is decisively defeated and nearly destroyed by the harsh winter.

1813 The War of the Sixth Coalition pits most of Europe against the weakened French. ♣ Chevreul is appointed professor of chemistry at Lycée Charlemagne; he publishes a major article on the chemistry of animal fats, showing how to combine them with potash to make a better soap than any then available. ♣ Critic Charles Blanc, who would later be credited with popularizing Chevreul in the art



Figure 19.1 Chevreul in 1808.

world, is born in Castres, France. ♣ Opera composers Giuseppe Verdi and Richard Wagner are born in Le Roncole, Italy, and Leipzig respectively. ♣ Jane Austen's *Pride and Prejudice* appears in London.

1814 Coalition forces invade France, occupy Paris, and restore the French monarchy, installing Louis XVIII as king. Napoleon is given the sop of the emperorship of the island of Elba. ♣ With Napoleon out of the way, the British turn attention to their American war, invading and burning the city of Washington. Stalemated, the two sides make peace at the end of the year with the Treaty of Ghent. ♣ Dr. Guillotin dies at age 75; the machine that he advocated remains in use in France until 1977.

1815 Napoleon escapes from Elba, raises an army, and marches on Paris, forcing Louis XVIII to flee. He rules France for a hundred days before being defeated at the Battle of Waterloo and exiled, this time forever, to the remote mid-Atlantic island of St. Helena. ♣ At the Congress of Vienna, the victorious powers strip France of its conquered territories and redraw the map of Europe along modern lines. ♣ A breakthrough year for Chevreul: in addition to four more articles on the manufacture of soap from pork fat, he demonstrates that diabetics excrete glucose in their urine; previously it was only known that it was some kind of sweetish substance. ♣ After several years of increased volcanic activity in the region, Mt. Tambora, in what is now Indonesia, erupts cataclysmically. It remains the biggest explosion our planet has seen in the last 1,700 years, a hundred times as powerful as the eruption of Vesuvius that buried Pompeii, or that of Mt. St. Helens in the twentieth century.

1816 The aftereffects of the supervolcano of 1815 create "The Year Without a Summer" with crops failing in much of Europe and the northern half of North America due to frost conditions in June and July. Famines occur in Germany, Ireland, China, and elsewhere; the dusty atmosphere creates brilliant sunsets that help propel English painter J.M.W. Turner into prominence. ♣ French inventor Nicéphore Niépce exposes the world's first photograph, using silver halide paper. The print is unstable and is quickly destroyed by normal daylight.

1817 Chevreul is promoted to full professor. He identifies gallstones as linked to a compound he calls *cholesterine*.

1818 Chevreul marries Sophie Davallet; their only child, son Henri, is born in the following year.

1819 Painter Théodore Géricault completes *The Raft of the Medusa*, today considered the quintessentially French Romantic canvas, shown in Figure 6.G. ♣ Birth year of novelist George Eliot, critic John Ruskin, and poet Walt Whitman.

1820 After thirty years of alternating periods of lucidity and insanity, King George III of Great Britain dies and is succeeded by son George IV.

1821 Death of Napoleon Bonaparte in his lonely place of exile, the island of St. Helena.

1822 French scholar Jean-François Champollion announces that he has used the Rosetta Stone to decipher the Egyptian hieroglyphic system. ♣ 190 years after Galileo was forced to recant as heresy his assertion that the sun did not revolve around the earth, the Vatican permits publication of his *Dialog Concerning the Two World Systems*.

1823 The U.S. announces the Monroe Doctrine, saying that Europe's constant wars made it unfit to meddle in the Western hemisphere. ♣ Chevreul publishes his first major book, *Chemical Research on Animal Fats*.

1824 Louis XVIII dies, but not before naming Chevreul director of dyes at the Gobelins. ♣ Beethoven's Ninth Symphony premieres in Vienna. ♣ Chevreul publishes *General Considerations on Organic Analysis*, to great acclaim from his colleagues.

1825 The new king, Charles X, reconfirms Chevreul's appointment. ♣ With J.L. Guy-Lussac, Chevreul patents a method of manufacture for stearic acid-based candles.

1826 Chevreul is elected a member of France's Academy of Sciences, and also London's Royal Society.

1827 Niépce exhibits the first photograph that survives today, a barely recognizable outdoor scene that requires eight hours of exposure, using a copper-etching process that will eventually morph into heliogravure. ♣ Death of Beethoven.

1828 Chevreul publishes a paper that foreshadows this book: "On the influence that two colors can have on each other when seen simultaneously." ♣ Death of Schubert at age 31.

1829 U. S. inventor William Burt patents the typewriter. ♣ Chevreul publishes a two-volume set, *Lessons of Chemistry Applied to Dyeing*.

1830 Charles X is deposed. His successor, Louis-Philippe, calls himself a “citizen-king.” ♣ Chevreul named professor of organic chemistry at the National Museum of Natural History. ♣ French writer Marie-Henri Beyle, pen name Stendhal, publishes *The Red and the Black*, a milestone in literary realism. ♣ Camille Pissarro, often called the father of Impressionism, is born in the Virgin Islands.

1831 Physicist Ogden Rood, whose influence on artists will be compared to that of Chevreul, is born in Connecticut.

1832 Chevreul isolates creatine, greatly increasing our knowledge of how human kidneys work. ♣ Berlioz’s *Symphonie Fantastique* premieres in Paris. ♣ Death of Goethe, shortly after the release of the second part of his *Faust*. ♣ Édouard Manet is born in Paris.

1833 Niépce dies. His cousin, Abel Niépce de Saint-Victor, winds up working for Chevreul at the Gobelins. ♣ Composer Johannes Brahms born in Hamburg.

1834 Three major births in the art and design world: the Impressionist painter Edgar Degas in Paris; William Morris, the great figure in the Arts and Crafts movement, in London; while in Massachusetts, Whistler’s Mother gives birth to a son named James.

1835 Historian and political thinker Alexis de Tocqueville publishes the first volume of his *Democracy in America*. It is understandable that Tocqueville wrote the leading historical analysis of the origins of the French revolution, but that a Frenchman’s take on American politics still is a classic is remarkable.

1836 After thirty years of off-and-on construction, the Arc de Triomphe in Paris is completed. ♣ The most influential American painter of the century, Winslow Homer, who referred to Chevreul’s book as “my Bible” and left a heavily dog-eared copy of it to posterity, is born in Boston. ♣ Chevreul’s good friend and occasional goad, the electrical theorist André-Marie Ampère (see §940) dies in Marseille.



Figure 19.2 Chevreul at 50.

1837 On the death of King William IV, his niece Alexandrina Victoria becomes Queen of England; she will reign for 64 years. ♣ Dickens’ *The Pickwick Papers* and *Oliver Twist* are published in London, as is Carlyle’s *The French Revolution*.

1838 The steamiest romance in cultural history, between the cigar-chomping Aurore Dupin (better known as novelist George Sand) and pianist/composer Frédéric François (born Fryderyk Franciszek) Chopin begins in Paris; it will last ten years. ♣ Composer Georges Bizet is born in Paris.

1839 Artist/designer Louis Daguerre, a former partner of Niépce, introduces the daguerreotype, the first commercially practicable use of photography. Seeing the demand for the process, the French government puts the technology into the public domain, and the daguerreotype takes over the world. ♣ Painter Paul Cézanne is born in Aix-en-Provence, France. ♣ *De la Loi du Contraste Simultané des Couleurs* is published in Paris.

1840 A partial English translation of Goethe’s *Farbenlehre* appears. ♣ Chevreul’s book is translated into German as *Die Farbenharmonie und Ihrer Anwendung* (On Color Harmony and Its Applications). ♣ Painter Claude Monet and sculptor August Rodin are born in Paris; romantic symphonist Pyotr Ilyich Tchaikovsky in Votkinsk, Russia.

1841 Pierre-Auguste Renoir, the greatest pure colorist of all the Impressionists, is born in Limoges, France.

1842 Dr. Crawford Long removes a tumor from a patient’s neck in Jefferson, Georgia. It is the first use of ether in an operation.

1843 Dickens’ *A Christmas Carol* is published in London. ♣ William Wordsworth named poet laureate of England.

1844 Alexandre Dumas publishes *The Three Musketeers* in Paris. Today we consider it a rousing historical novel, but then, with the monarchist-republican battle still in progress in France, it was taken as an anti-aristocracy screed.

1845 A blight destroys the Irish potato crop, creating the Great Famine; seven years later, Ireland has lost a quarter of

its population to death and emigration. ♣ Chevreul's father dies at age 91. His mother lives on until 93. As doctors say, nothing like good genes.

1846 Mexican-American War begins, resulting in Mexico's loss of much of what is now the U.S. Southwest. ♣ A busy year for Chevreul, who gives presentations on the cultivation of grapevines, on "general consideration of variations among individuals in the groups called varieties, races, sub-species, and species," and on "several chemical reactions of interest to the hygiene of populous cities." In his spare time, he produces a new book, *Theory of Optical Effects with Silk Fabrics*.

1847 In England, each of the three Brontë sisters presents a novel: Charlotte's *Jane Eyre*, Emily's *Wuthering Heights*, and Anne's *Agnes Grey*.

1848 A new French Revolution deposes King Louis-Philippe, who flees to England. The Second French Republic is established, with Louis Napoleon Bonaparte, the original Napoleon's nephew, as president. ♣ Across the channel in London, a pamphlet by Karl Marx and Friedrich Engels appears, titled *The Communist Manifesto*. ♣ The Cavendish Society, London, publishes a 74-page Chevreul paper, *Physical Investigations on Dyeing*, largely duplicating the content of several pages of this book. It is the first English-language presentation of his ideas. ♣ Paul Gauguin, noted for his lush paintings of Tahitian scenes, is born in Paris.

1849 A gold rush begins in California. ♣ Chevreul presents an Academy paper on chemical analysis of archaeological artifacts.

1850 Upon the death of Wordsworth, Alfred Tennyson becomes poet laureate of England. ♣ Nathaniel Hawthorne's *The Scarlet Letter* is published in Boston. ♣ Chevreul presents an Academy paper on chemical qualities of oil paints.

1851 Legally barred from seeking a second term as president, Louis Napoleon seizes power in a coup d'état. ♣ The first World's Fair, the Crystal Exhibition, opens in London. The coloring of French textiles being shown is widely considered the best in the world, and Chevreul gets the credit. ♣ Herman Melville's *Moby-Dick* is published in Boston.

1852 Second French Empire proclaimed. Louis Napoleon becomes Emperor Napoleon III, 48 years to the day after his uncle crowned himself.

1853 Crimean War starts between the U.K. and Russia. ♣ Vincent van Gogh born in Zundert, the Netherlands. ♣ Chevreul arranges for a presentation by his subordinate Niépcy de Saint-Victor, who is perfecting heliogravure. Unbeknownst to either, the process uses radioactive salts to etch a photographic image into copper, which is then printed.

1854 France enters the Crimean War, allied with the U.K. ♣ Napoleon III launches huge reconstruction projects in Paris, totally remodeling the city over a period of 15 years. ♣ Chevreul, ever one to debunk pseudoscience, publishes, at the request of the Academy, a book called *The Divining Rod, the Explorer's Pendulum, and Table Turning, From the Point of View of History and of the Critical and Experimental Method*. He confirms the findings of Michael Faraday that these water-finding methods are worthless. ♣ The first English translation of *De la Loi du Contraste Simultané des Couleurs* appears in London, titled *The Principles of Harmony and Contrast of Colours*; it remained the standard translation until, hopefully, the publication of the book that you are now reading.

1855 Society for the Advancement of Industry gives Chevreul a large cash award and a medal for his work with candles. ♣ Walt Whitman's poetry collection *Leaves of Grass* is published in Brooklyn. ♣ The *Edinburgh New Philosophical Journal* reviews the English translation of this book; you can read it starting on Page xvii.

1856 Crimean War ends with an Anglo-French victory. ♣ Niépcy de Saint-Victor publishes *A Practical Treatise on Heliogravure*. ♣ English chemist William Henry Perkin creates a new and inexpensive dye, *mauveine*; previously, all purple dyes were extremely costly, limiting their use to royalty and the wealthy. Mauve takes on an important role in women's fashion.

1857 Chevreul receives the oldest award in science, the Copley Medal of the Royal Society of London, "for his researches in organic chemistry, particularly on the composition of the fats, and for his researches on the contrast of colours." ♣ A second, abridged and renumbered translation of *De la Loi du Contraste Simultané des Couleurs* appears in London, titled as *The Laws of Color Contrast and Their Application*. ♣ Gustave Flaubert's first novel, the ultra-realistic *Madame Bovary*, is published in Paris.

1858 France wars on Austria; Napoleon III occupies Milan. ♣ Jacques Offenbach's

operetta *Orpheus in the Underworld*, with its famous Can-Can music, debuts in Paris.

1859 Charles Darwin's theory of evolution explodes into public consciousness with the publication of *On the Origin of Species* in London; Chevreul, not buying into it, later remarks, "Me? The son of an orang-utan?? Never!!!" ♣ Dickens' novel of the French Revolution, *A Tale of Two Cities*, is published in London. ♣ Georges Seurat, the father of neo-Impressionism, is born in Paris. ♣ Chevreul presents a paper on visual perspective to the Academy. ♣ French chemist François Emmanuel Verguin creates a new aniline dye called *fuchsine*. Later in the year, he changes its name to honor a French military victory near the Italian town of *Magenta*.

1860 Giuseppe Garibaldi leads a successful anti-monarchy assault on Sicily, a major step toward Italian unification. ♣ Abraham Lincoln is elected President of the United States.

1861 American Civil War begins. ♣ In London, James Clerk Maxwell demonstrates a prototype color photograph, using the same idea of shooting through red, green, and blue filters employed today. ♣ In Paris, Chevreul publishes a thousand-page book entitled *A Proposal for a Means of Defining and Naming Colors*, and a 440-page first installment of a work on dyeing.

1862 Garibaldi attacks the French in Rome and is repulsed. ♣ Napoleon III sends troops to Mexico in support of his puppet, Emperor Maximilian I, who is an Austrian archduke. ♣ Victor Hugo's epic novel *Les Misérables* is published in Paris, to largely negative reviews. ♣ Chevreul's wife Sophie dies. ♣ The most Impressionist of all composers, Claude Debussy, is born in Saint-Germain-en-Laye, France.

1863 Lincoln's Emancipation Proclamation frees the American slaves. ♣ Chevreul named director of the National Museum of History; publishes the second part of his text on dyeing. ♣ An uproar at the annual Salon de Paris, the most prestigious art show: the conservative authorities reject innovative works of Manet, Pissarro, Whistler, and others. Napoleon III declares that the people have a right to make up their own minds, and orders the rejected works shown in the Palace of Industry; this becomes known as the *Salon des Refusés* and draws bigger crowds than the Salon itself.

1864 Maxwell presents his paper *A Dynamical Theory of the Electric Field to the Royal Society in London*, proposing that light is an electromagnetic wave. ♣ Chevreul publishes a brief *The Colors and Their Applications to Industrial Arts*, with graphics showing the beloved chromatic circle described here in Chapter 4. He also goes far afield from pure science with a philosophical *On Abstraction, Considered Relative to the Fine Arts and Literature*.

1865 Confederate General Robert E. Lee surrenders his army at Appomattox, making the end of the Civil War a foregone conclusion; five days later, Lincoln is assassinated. ♣ Chevreul publishes an updated commentary on simultaneous contrast, and also expands on his philosophical work of the previous year, this time calling it *How Human Knowledge Springs from Natural Philosophy, Consistent With How the Mind, in Studying the Unknown, Moves from the Abstract to the Concrete and Back Again*.

1866 One of Chevreul's great works, *A History of the Knowledge of Chemistry*. ♣ He also presents data on a novel medical field, capillary affinity electrophoresis. ♣ Fyodor Dostoyevsky's *Crime and Punishment* is published in Moscow. ♣ Also in Moscow, Wassily Kandinsky, who would become one of the most important painters of the twentieth century, is born.

1867 Under pressure from forces led by Benito Juárez and by the United States, Napoleon III withdraws French troops from Mexico. Emperor Maximilian is executed by firing squad. ♣ The U.S. purchases what is now Alaska from Russia. ♣ Swedish scientist Alfred Nobel invents dynamite. ♣ Chevreul presents research on prevention and consequences of foot and mouth disease in cattle, and an updated guide to arts that speak to the eye through materials of a perceptible size, the topic of Chapter 8 here. ♣ Blanc publishes *Grammar of the Arts of Design*, the book that introduced many to Chevreul.

1868 The Fourteenth Amendment to the U.S. Constitution, guaranteeing "equal protection of the law" to all regardless of race, religion, or national origin, is ratified.

1869 Tolstoy's epic of the impact of Napoleon's 1812 Russian campaign, *War and Peace*, is published in Moscow. ♣ Wagner's *Das Rheingold*, the first opera of his Ring cycle, premieres in Munich. ♣ Opening of the Suez Canal. ♣ Death of Berlioz. ♣ Fauvist painter Henri Matisse is born in Le Cateau-Combrésis, France.



Figure 19.3 The French government authorizes a bronze medal for Chevreul's hundredth birthday. The touching caption on the reverse reads, "From the youth of France to the dean of students."

1870 France incomprehensibly declares war on Prussia; its army is crushed by Bismarck's superior firepower. Napoleon III is captured at Sedan; Prussians surround and lay siege to Paris; communication in and out is by carrier pigeon or balloon. A Third French Republic is proclaimed. ♣ A Chevreul presentation at the academy expands into a 400-page book, *On the Experimental Method and the Generality of Its Applications*. ♣ *Die Walküre* premieres in Munich.

1871 Prussians shell the Museum of Natural History; Chevreul, still its director, enlists in the National Guard at age 85. ♣ Paris, starving, surrenders; Wilhelm I proclaimed German Emperor at the Palace of Versailles. France cedes Alsace-Lorraine to Germany, gets it back after World War I, cedes it again before World War II, and gets it back afterward. ♣ Defeated Paris is briefly ruled by a Commune; Eugène Pottier, a member, writes a song whose second line is "Arise, prisoners of hunger." The title is *L'Internationale*, and it becomes the anthem of the worldwide communist movement.

1872 Novelist George Eliot's masterpiece of realism, *Middlemarch*, is published in London.

1873 Maxwell publishes *A Treatise on Electricity and Magnetism*. ♣ Marshal Patrice de MacMahon—whose honorary title is Duke of Magenta—becomes president of France. ♣ Royal Society of Arts, London, awards Chevreul its annual Albert Medal "for his chemical researches, especially in reference to saponification, dyeing, agriculture, and natural history, which for more than half a century have exercised a wide influence on the industrial arts of the world." ♣ Chevreul, whose rejection of the new art form is beginning to mellow, publishes *The Truth About the Invention of Photography*.

1874 The "Anonymous Society of Painters, Sculptors, Engravers, etc." arranges a dis-

play of its members' works at the Paris studio of the photographer who goes by the professional name of Nadar. Among those represented: Cézanne, Degas, Monet, Pissarro, and Renoir. Critic Louis Leroy seizes on Monet's use of the word *Impression* in one of his titles and dismisses the entire show as "The Exhibition of the Impressionists." The artists cheerfully adopt the name. ♣ Chevreul publishes on an old subject of interest—a chemical analysis of Peruvian guano—and a new one: *Discussion of Several Phenomena That Are Consequences of Old Age*. ♣ Winston Churchill is born in Oxfordshire, England.

1875 The new home of the Paris Opera, the over-the-top neo-Baroque Palais Garnier, opens its doors. ♣ Bizet's *Carmen* premieres in Paris, but at the Opéra-Comique, not the Garnier. Its composer dies shortly thereafter at age 36.

1876 First complete cycle of Wagner's four *Ring* operas, at the venue he designed, the Bayreuth Festspielhaus.

1877 Thomas Edison invents the phonograph. ♣ Whistler sues critic John Ruskin for libel based on reviews calling his paintings "rubbish" and accusing him of "flinging a pot of paint in the public's face."

1878 Gilbert & Sullivan's operetta *H.M.S. Pinafore* captivates London. ♣ Also in London, a jury finds in favor of Whistler in his libel case—and awards him *one farthing* in damages. Legal fees ruin the artist financially. ♣ Two new books from Chevreul: *A Summary of Material from the Greek Philosophers Up To and Including Lavoisier*, and even more imposing, *Studies of the Processes of the Human Mind in Search of the Unknown With the Help of Observation and Experience, and How to Know Whether One Has Uncovered the Truth or an Error*.

1879 Edison tests the first light bulb. ♣ In New York, Rood's *Modern Chromatics* is published. ♣ Henrik Ibsen's play *A Doll's House* premieres in Copenhagen. ♣ Chevreul semi-retires from the Museum of Natural History, retaining his full teaching load as a professor and accepting the title of "honorary director;" he also publishes *Complementary Studies on Human Vision*.

1880 The First Boer War begins in South Africa; the outdated tactics of the British army result in a Boer victory in three months. ♣ Fyodor Dostoyevsky publishes *The Brothers Karamazov* in Moscow.

1881 The brilliant and politically astute James Garfield, committed to unifying the nation after the divisive Civil War, is shot by a lunatic shortly after taking office as U.S. President. The wound would be considered trivial today, but the unsanitary medical procedures of the time lead to his death after months of agony. ♣ Painter Pablo Picasso is born in Málaga, Spain. ♣ Composer Béla Bartók is born in Romania.

1882 Composer Igor Stravinsky, whose *Rite of Spring* would revolutionize twentieth-century classical music, is born in Lomonosov, Russia. ♣ Tchaikovsky's *1812 Overture*, celebrating the Russian defense against Napoleon, premieres in Moscow. ♣ Chevreul is the featured speaker at a banquet of the Central Society of Horticulture. ♣ Franklin D. Roosevelt is born in Hyde Park, New York.

1883 Chevreul retires as director of the Gobelins. ♣ Death of Richard Wagner. ♣ Chevreul's final publication: *Notes on How Color Vision is Affected by the Movement of Objects*.

1884 American inventor Hiram Maxim, recently moved to the U.K., produces the first machine gun. ♣ Mark Twain's classic *Huckleberry Finn* is published in the U.K., several months before it appears in his native country.

1885 *The Mikado* begins a two-year run in London. ♣ Georges Seurat and Paul Signac, the fathers of Neo-Impressionism, visit Chevreul at the Gobelins. ♣ Robert Delaunay, who will become Chevreul's most prominent follower among their successors, is born in Paris.

1886 The French government authorizes a celebration of Chevreul's hundredth birthday, and



Figure 19.4 Chevreul poses for Nadar in the world's first published photographic interview, 1886. The cover headline: "The Art of Living to a Hundred."

commissions Louis-Oscar Coty to cast a bronze medal for the occasion. ♣ Chevreul sits for the first known photographic interview, conducted by Nadar. The package appears in *Le Journal Illustré*. ♣ The neo-Impressionist period begins with the display of Seurat's massive canvas *A Sunday Afternoon on the Isle of la Grande Jatte*.

1887 Léon Fagel is commissioned to sculpt a statue of Chevreul for exhibition at the 1889 World's Fair in Paris. ♣ Construction begins



Figure 19.5 Gustave Eiffel immortalized 72 top figures in French sciences by carving their names into his eponymous tower (above). The inscriptions were later painted over, but recently they have been restored in a different way (below).

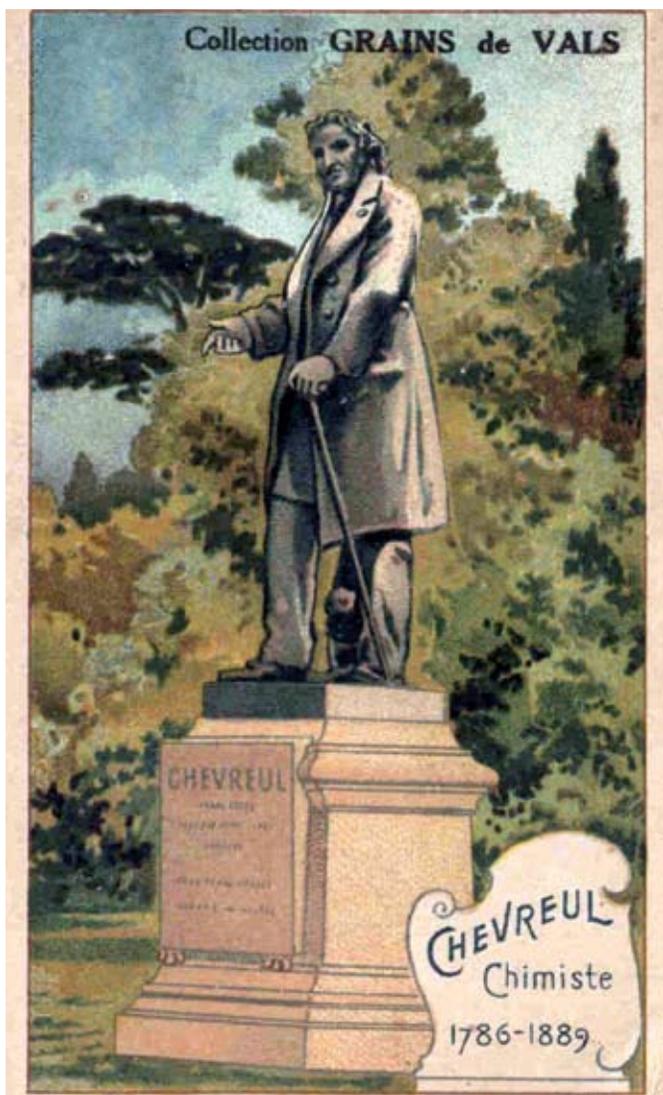


Figure 19.6 Left, Fagel's statue of Chevreul in the Museum of Natural History's botanical garden is portrayed in a late nineteenth-century lithograph, an advertising card for a laxative. Right, the statue today.

on the entrance arch to the fair, a tower designed by architect Gustave Eiffel. Saying that the structure should represent technological progress, Eiffel plans to carve in stone on its side the names of the 72 leading scientific, engineering, and mathematical figures in French history. ♣ Czech artist Alphonse Mucha, whose Art Deco-style designs will revolutionize the advertising poster, moves to Paris. ♣ In London, the first annual exhibition of the Arts and Crafts Society introduces an entire new school of decorative arts, using fine materials and often ancient designs; among its main practitioners is William Morris. ♣ Sherlock Holmes makes his first appearance, in Sir Arthur Conan Doyle's *A Study in Scarlet*.

1888 "You press the button, we do the rest," is the advertising slogan for the new Kodak box camera, manufactured in the United States. ♣ French inventor Louis Le Prince shoots

the first motion picture. ♣ Jack the Ripper terrorizes London.

1889 On March 27, Henri Chevreul dies. Friends conspire to hide the news from his father. Four days later, Eiffel raises the tricolor over his finished tower. Of the 72 names immortalized underneath the first balcony, only two are still alive—but not for long. On April 3, Chevreul takes his last walk, and has to be helped up the stairs to his bed, where he dies on April 9. ♣ When the World's Fair opens, Fagel wins a gold medal for his Chevreul sculpture. The question was what to do with it after the fair closed. The obvious solution seemed to be to display it in the Museum of Natural History. On further reflection it was realized that Chevreul himself would have preferred the museum's botanical garden. The statue remains there today.