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Frederick Brown

Eiffel's Tower

"A monumental political argument" is what one contemporary called the Eiffel Tower, which bestrode the Universal Exposition staged in 1889 to celebrate the centenary of the French Revolution. His point was driven home by an accident of history. During the previous year, factions unreconciled to parliamentary government—monarchists and Bonapartists, among others—had pinned their hopes of overthrowing the Third Republic on a charismatic ex-general named Georges Boulanger. Discharged from the army, Boulanger had entered electoral contests all over France and won them handily. After his most recent victory, on January 27, 1889, partisans urged him to march on the Élysée Palace. He did not, but his discretion went unrewarded. Word got out that the government planned to try him on charges of treasonable activity. Boulanger took fright and on April 1, a day after the centennial tower's inauguration, slipped out of the country into Belgium, leaving Boulangists high and dry.

The Revolution, which laid the groundwork for a community that transcended national boundaries, had marked the beginning of a new era, according to Édouard Lockroy, minister of commerce and industry. Releasing creative energy into an untrammeled world, it had fostered the progress of mankind as a whole. The fair, he declared in his preface to an official report, glorified revolutionary ideals and displayed their fruitfulness.

Lockroy had statistics at hand to demonstrate the fraternal reach of France's birthday party. Jammed onto the fairground were far more products than in 1878, bigger machines, more ornate pavilions, more *pompier* art, a "Retrospective of the History of Work and the Anthropological Sciences, including military arts," a "History of the Human Habitat in forty-four separate displays," a replica of the Bastille, and 55,486 exhibits altogether.*

As for the Exposition tower, with its immense steeple poking into the clouds, it was,

*No one knew better than the minister, however, how many exhibits represented foreign interests authorized to join the fair by governments that would not do so in their own name. Monarchies, especially moribund ones, could not openly participate in the celebration of a historical event invoked by subjects plotting their demise at home. Officially absent, then, were Austria-Hungary, Belgium, Brazil, China, Spain, Great Britain, Italy, the Low Countries, Portugal, Rumania, Russia, Denmark, Sweden, and Norway.

This essay is adapted from a chapter in *The Alien Within: France in the Age of Dreyfus,* by Frederick Brown, to be published by Knopf in January 2010.

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he wrote, "the image of progress such as we conceive of it today: a pole around which humanity spirals eternally upward." But where Lockroy saw a steeple, others—and not only aggrieved Boulangists—saw an insult. What enraptured the Republican minister dismayed compatriots who associated republicanism with impotence, "progress" with movement away from true center, universality with alienation, and the tower itself with Babel.

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Like the New York World's Fair of 1939, the Paris Exposition of 1889 gave a proud face to a harrowed nation. On November 8, 1884, when the government decreed that an Exposition should open in five years' time, distress was widespread and vocal. Strikes at the coalfields of Anzin, Decazeville, and Vierzon lasted for weeks or months. The metallurgical industry and building trades languished. Two hundred thousand Parisians, many of whom demonstrated on the Place des Invalides in March 1883, were said to be unemployed. Many others, calling themselves "les Affamés" ("the Famished"), assembled in April 1885 on the Place de l'Opéra, where bourgeois unfamiliar with the sight and smell of misery since Baron Haussmann's earthmovers had driven the urban poor from Paris's center to its outlying *banlieue,* could not easily ignore them.

The discontented spoke loudest in the general elections of October 1885. Voter sentiment gravitated to extremes. While Clemenceau's party gained on the Left, Bonapartists and Monarchists made even more significant gains on the right. Republicans still held sway, but only when radicals and moderates, each other's bane, agreed to cooperate. More often than not, they presented a cracked façade, which boded well or ill for all who read the crack as a sign of the Republic's fragility. Paul Cambon, who had recently called Boulanger's bluff in Tunisia, thought that circumstances favored the restoration of a king or the rise of a demagogue. "The general impression is that the Republic is at its wits' end. Next year we shall see revolutionary excesses, then a violent reaction. What will come of it? Some kind of dictatorship, no doubt." His friend Jules Ferry wrote ruefully that monarchism was once again a force to be reckoned with.

Given this vexed state of affairs, the symbolic role of the Exposition acquired peculiar importance, and historical symbolism imbued everything associated with it, not least of all the stage chosen for its *mise en scène*: the Champ de Mars. During the 1880s, this enormous sandlot at Paris's western edge was a military drill ground. Older Parisians would have remembered it from 1867 as the site of the Palace of Industry in Napoleon III's pre-war Exposition. But cultural memory reached back much further, to an event some of whose rubble may still have lain underneath that vacant expanse. On May 7, 1794, at Robespierre's behest, the Revolutionary Convention, which had outlawed Catholicism five months earlier, proclaimed the sanctity of a deistic substitute for the Christian God and decreed that a festival be held every June. The first—and only—Fête de l'Être Suprême (Festival of the Supreme Being) took place on June 8. It began in an amphitheater improvised outside the Tuileries

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palace, where Robespierre, standing on an upper tier, spoke of the need to root out vices leagued against the Republic and exhorted the assembled thousands to honor the "Author of Nature." It continued across the river at the Champ de Mars, with deputies, citizens, foot soldiers, cavalry, floats, bands, and drum corps moving from one site to the other in a long procession elaborately choreographed by the painter Jacques-Louis David. What awaited everyone on the Left Bank was, remarkably, an artificial mountain.* Broad enough to accommodate the entire Convention, whose several hundred members, led by Robespierre, climbed a steep path to its summit and disposed themselves there under a real tree, this impressive facsimile beetled over the choruses singing accompaniment to patriotic rituals that evoked ancient Sparta. With swords drawn, adolescents swore to defend the fatherland, as young mothers held their infants above their heads in pledges of sacrifice.

Four generations after David designed an altar to the Supreme Being, an engineer of genius wrought a monument to the god of scientific progress. Where the mountain had stood, a tower rose. The structure that Gustave Eiffel envisioned in the 1880s was to serve as the centenary's portal and its beacon. It would introduce visitors to the fairground and lift them high above the city. It would be an arch evoking the Arc de Triomphe and a spire contesting the Sacré-Coeur's command of the sky over Paris.

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Gustave Eiffel, who would have ranked high among candidates for the mandarinate ruling France if Henri de Saint-Simon's ideal of a scientific autocracy had ever been realized, was bred to the role of engineer/entrepreneur by an ambitious family. His father, Alexandre, had joined the Grande Armée in 1811 at age sixteen and fought against the Austrians in Northern Italy. Wounded twice, he returned to field duty in 1815 and rose to the rank of sergeant-major during the so-called Hundred Days of Napoleon's second reign. Marooned after Waterloo in a civilian world he knew almost nothing about, Alexandre enlisted in the royal army as a private. (Wanting his combat experience under Napoleon recognized, he would vainly petition every successive regime for membership in the Légion d'Honneur and concede defeat only when Louis Napoleon informed him in 1852 that his exploits at Mincio and Borghetto had been insufficiently heroic to warrant commemoration.) Under Louis XVIII, the private rose in the ranks once again, concealing his Bonapartist sympathies. Army service under the Bourbons was an anticlimactic affair, but for Eiffel it became something else during a stint at the garrison in Dijon. There he met and married the daughter of a lumber merchant, Mélanie Moneuse, an indomitable Burgundian whose conjugal plans did not square with the peripatetic life of a noncommissioned officer.

Gustave's entrepreneurial spirit came from his mother. Bent on staying in Dijon, where she would in due course set up shop, Mélanie insisted that her husband resign his brevet and accept civilian employment. Her business was the storage of coal

*The mountain alluded to the political party known as "la Montagne," which had acquired that sobriquet by occupying the uppermost rows of the tiered legislature. It became virtually synonymous with "Jacobin."

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shipped to Dijon on the Canal de Bourgogne from fields southwest of the city. With the industrial development of the Ouche valley, furnaces at Le Creusot smelted around the clock, and the mines that fed them reached deeper below the countryside. For Mélanie, industrialization spelled prosperity. From modest beginnings her operation became a network of wagons, barges, and warehouses. By the early 1830s, Alexandre had quit his clerkship at the prefecture and joined her in business. The couple lived only yards away from the company's mooring dock. Their first child, Gustave, was born in 1832, eight years after their wedding. "[My parents] worked relentlessly," he remembered. "From dawn to dusk they supervised the unloading of boats and the loading of wagons, in every kind of weather. This struck my imagination. They had had a series of boats built, the first of which was named *Le Beau Gustave* and the second *La Petite Marie,* for my sister."

When Gustave witnessed his parents at work on the quai Nicolas-Rolin, it was as a sojourner. Lacking the time to raise her son, Mélanie boarded him with her widowed mother, in whose household the boy breathed the incense of Catholic France. A half-blind, pious old lady, Mme Moneuse had priests for company, and Gustave's main chore, after school, was to read her the daily office under pain of having his knuckles rapped. This closed world would have been unrelievedly dismal if not for the presence of a high-spirited uncle (by marriage) whose oaths of allegiance to the secular republic rang loud and true. "I particularly remember," wrote Eiffel, "how [Mollerat] looked at me fixedly from behind his large spectacles and bushy eyebrows and said, 'Remember, my nephew, that all kings are scoundrels,' emphasizing the point with his index finger." What lent authority to this admonition, besides Mollerat's physical stature and a tale about Robespierre having befriended him during the Revolution, were his scientific credentials. As a successful chemist who manufactured products that carried his name, Mollerat spoke from a bully pulpit. Gustave listened, perforce, and at an early age adjusted to the family supposition that chemistry was his calling.

When, in 1841, the newly affluent Eiffels retired to a country villa, they reclaimed their nine-year-old son from Mme Moneuse. Reading the daily office was a ritual soon forgotten, and in adolescence Gustave took full advantage of parents who may have wished to atone for their neglect by cosseting him. Not until the last year or two of high school did his intellect awaken. He took first prize in Greek translation (French to Greek), and his honorable mentions in physics and chemistry banished any misgivings the family may have had about the path laid out for him. He would study at the Collège Sainte-Barbe, a school in Paris that prepared candidates for the École Polytechnique. He would become a chemist. He would return to Dijon, or Pouilly-sur-Saône, and take over Uncle Mollerat's plant.

The path he followed would be far more aleatory. His parents' fears that once in Paris he might succumb, like Balzac's provincials, to the lure of Babylon were not groundless. Preoccupied with clothes and theater, Gustave courted failure at Sainte-Barbe, relying upon his natural facility to muddle through. It served him most of the way, but on the entrance examination for Polytechnique he came up short and enrolled instead at a marginally less prestigious institution—the École Centrale des Arts et Manufactures.

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Uncle Mollerat's heir apparent entered Centrale with the knowledge that its founders included a world-famous chemist, Jean-Baptiste Dumas. This endorsement might have been more consoling if he had shown greater aptitude for the science to which the powers-that-were had assigned him. Chemistry was not his first, or second, love. Low marks tell the story. He nonetheless bent himself to family expectations and graduated in 1855 (during the first Paris Exposition, which enthralled him). Life then took a fateful turn. His father and his uncle quarreled bitterly. While political differences may not have caused bad blood to flow, they justified the feud. Mollerat inveighed against Louis Napoleon's coup d'état; Alexandre Eiffel applauded it. Close relatives could not occupy neutral ground, least of all Gustave. With the family split, all communication with his uncle ended. Mollerat died soon afterward, and his business failed as a consequence. Eiffel the reluctant heir found himself mercifully disinherited.

Disinherited but unemployed. Seeing in the person of her son an inert object that wouldn't move unless pushed, Mélanie appealed to her former clients for help. One of them introduced Gustave to Charles Nepveu, a brilliant alumnus of Centrale and the founder of a company that manufactured tools, forges, steam engines, boilers, sheet iron, and rolling-stock. Separated by only six years, the two men knit.

Their brief collaboration was intense, and Gustave, whose strong suite had never been single-mindedness or ambition, now worked as if a bottled-up genie had suddenly leapt free. Nepveu accumulated projects and Gustave organized them. "I'm at the office by 8:15 every morning," he wrote to his mother, whose approval (not easily gained) he would always seek. "At a quarter to eleven I take off for lunch and must be back at noon to confer with M. Nepveu . . . Dinner is at a quarter to six. But don't imagine that my day is over. Not at all. Except on Mondays, when M. Nepveu receives friends, he has me work with him until eleven or midnight . . . If I stay here, my future is assured. Whatever happens, I will learn a great deal, for M. Nepveu puts a lot on my plate." He was soon to learn something as well about the darker side of his mentor's exuberance. Having undertaken more than he could afford, Nepveu, faced with mounting debt, vanished one day and reappeared a week later, unable to explain his absence or to remember that during it he had written a suicide note. By then, the company had run aground, stranding Gustave's dreams of an assured future on an unmapped shore. Equally unforeseen were the events that floated those dreams again several months later. Early in 1857, a Belgian manufacturer of railroad materiel, François Pauwels, bought the insolvent firm, with an eye to Nepveu's contracts. Of particular interest was an iron bridge over the Garonne river at Bordeaux, to be built for a railroad network owned by the immensely powerful financiers, Isaac and Émile Pereire. Requiring three thousand tons of girders, it would yield handsome profits, and Nepveu, however unreliable in other respects, was an engineer qualified to solve the technical problems involved. Furthermore, Gustave Eiffel's remarkable talent for organization had not gone unnoticed. At age twenty-five he was made project manager, equal in rank and authority to Nepveu.

Managers far more experienced than he might have begged off. The task was formidable. Iron caissons in beveled concrete mantles would be sunk eighty-two feet under the riverbed to provide a base for iron cylinders stacked like segments of a classical column. These would make six piers supporting a span 560 yards long—the

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longest in Europe at the time—with thick girders reinforced by iron latticework, and massive abutments at either end. The new technology of air compression would enable workers to operate below water level. But first a wooden service bridge would be needed upriver from the construction site. Problems abounded, and the Garonne at Bordeaux, where swift currents flowing down from the Pyrenees met high tides rolling in from the Atlantic, was dangerously turbulent.

In less than two years, Eiffel accomplished a feat of major proportions. "The general aspect of the bridge, whose design varies infinitely according to one's vantage point, is at once elegant and majestic," *Le Monde illustré* reported on August 25, 1860. "So simple, so untrammeled, the roadway barely flush with pillars that support it, it compels one's admiration! . . . The interior offers truly remarkable effects of perspective. It is ah immense gallery stretching beyond eye's reach, in which light flooding it from all sides sharply outlines every structural feature and rivet." The young man was rewarded with the title of engineer, a substantial salary, and a commission on projects secured for Pauwels in the future. Projects there would be, in abundance. Having greatly impressed colleagues at the Compagnie du Midi, he was set to play his part in the conquest of space by rail before tilting his vision upward. This project launched him. Nepveu, to whom he owed so much, became irrelevant.

The bridge at Bordeaux had not yet been completed when Eiffel was asked to build a small viaduct over the Garonne, also at Bordeaux. During the next year his work took him farther afield in southwestern France, with plans for bridges over the Lot and Dordogne rivers. *Le Moniteur,* the official government newspaper, ran a long article about the new technology implemented by Eiffel in a lattice bridge over the Nive at Bayonne. His reputation therefore preceded him when he came north in 1862, newlywed, to manage Pauwel's Paris operation. Living near the factory in Clichy before moving to an apartment on the rue de Pétersbourg (almost next door to Édouard Manet), he bade farewell to Aquitaine.

The Pereires' empire began crumbling in the early 1860s, and industrialists heavily dependent on it found themselves mired in financial difficulties. Pauwels and Company, which supplied the Compagnie du Midi with locomotives as well as bridges, was starved for business, and Eiffel, networking feverishly, scratched together only enough to maintain a faint professional pulse. It turned out once again, however, that an employer's reverses ultimately promoted his career. Driven as never before, and bolstered by admirers well-placed in the engineering community, he struck out on his own. The year was 1864. He had a delicate, acquiescent wife, three babies, no capital, and a contract to organize the production of thirty-three small steam locomotives (called "locomobiles") for the Egyptian government.

Egypt, where he spent almost four months arranging delivery, exposed him to spectacles of grandeur and backwardness that stretched his mind in opposite directions. Dilatory government officials, for whom terms of a contract were as elastic as the quoted price of articles at the souk, exasperated him. "You can't imagine the time wasted here in paltering and the kind of distracted people with whom one must deal," he wrote to his father. "One never knows on what ground one stands. I've been here for twelve days and am frightfully bored." So obtuse were Alexandrians that news of

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Abraham Lincoln's assassination in early May perturbed them "only to the extent that it might affect the market price of cotton." But there were also the pyramids to take in, and the Suez Canal, which had been under construction since 1859. He toured the area at the Canal Company's invitation and marveled at it all—the stupendous trench, the blooming green markets at a city built by De Lesseps on the shore of Lake Timsah, the railroad and freshwater canal running from Ismailia west to Zagazig. "After having seen the desert, the immense, desolate expanses deprived of water and vegetation, one understands first of all what boldness was required to place thousands of workers on such soil, then to sustain them beneath the torrid sun," he noted. "The impression one gets of man as supreme conqueror of the desert is all the more striking because its conquest took so little time and cost so few victims." Not that he was as blind to natural beauty as his imperial language suggests. He was enraptured by the sight of islands seemingly afloat in the vapor rising from Lake Menzaleh and of flamingos trolling its shallow waters. But where literary pilgrims such as Gustave Flaubert sought refuge in the "Orient" from bourgeois France, Gustave Eiffel thrilled to evidence of mankind's mastery of nature.

It followed nicely, then, that after his return, several of the men planning an event designed to celebrate France's modernity, prestige, and global reach should solicit his collaboration. With the armature of buildings that would stand no longer than needed for a six-month fair, Eiffel first planted himself on the Champ de Mars.

In April 1867, Louis Napoleon, who had been at work reinventing Paris ever since he had proclaimed himself Napoleon III fifteen years earlier, inaugurated his second Universal Exposition. Among the six million people who eventually attended, those who came by special invitation included the tsar and the tsarina, the king of Prussia, the khedive of Egypt, the mikado's brother, the sultan of Turkey, the Hapsburg emperor, and the Prince of Wales. During several months, hardly a week passed that Louis did not have occasion to greet some panjandrum alighting at a railroad depot and lead him in military pomp to the Tuileries Palace, where gala after gala preempted other, more banal affairs of state. Economic misery was rampant, but few looked backstage. All along the boulevards, theaters, restaurants, and boutiques drove a thriving trade as Paris mobilized its vast pleasure industry for visitors who arrived by the trainload or boatload.

"French is the language least heard on Paris streets," declared one chronicler, and this polyglot horde was indeed ubiquitous. It filled the Théâtre des Variétés when Offenbach's *La Grande Duchesse de Gérolstein* opened there on April 12. It fed its eyes on women high-kicking at dance halls (to which it found its way by following a guide entitled *Parisian Cytheras*). It oohed at fireworks in the Tuileries Gardens and aahed at gorgeous carriages in the Bois de Boulogne, where Society paraded its wealth every afternoon. Gravitating to light, to movement, to fanfare, to novelty, it did not neglect Paris's venerable monuments but often glimpsed them *en passant,* as did Mark Twain, who wrote in *The Innocents Abroad*: "We visited the Louvre at a time when we had no silk purchases in view, and looked at its miles of paintings by the old masters." Old masters couldn't quite compete against Blondin waltzing on a tightrope with blazing Catherine wheels fastened to his body. When the aerialist

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performed in a suburban pleasure garden, the horde of visitors flowed away from Paris like the sea at ebb tide. And when in October this horde left Paris for good, laden with silk from the great textile mills at Lyon, the image graven on its mind was more likely to be of machines in the Palace of Industry than of *Le Déjeuner sur l'herbe* in Manet's little pavilion.

The Palace of Industry occupied the Champ de Mars, where Eiffel's tower would stand two decades later. Looming above gardens and grottoes laid out by Adolphe Alphand, architect of the Bois de Boulogne, this industrial-age Colosseum was an immense iron-and-glass oval whose bulk dwarfed the minarets, the pagodas, the domes, the cottages, the kiosks built to represent nation-states. Unlike the Eiffel Tower, the Palace of Industry did not outlive abuse heaped on it by those who lamented France's "Americanization"; but while it stood, it advertised more comprehensively than any American structure the materialist worldview against which Pope Pius IX had inveighed in *The Syllabus of Errors.*

Had Pius ever seen the Palace, its six concentric galleries might have put him in mind of Dante's hell, especially by day, when a roar of machinery drowned the hubbub of the crowd and vapor from steam engines billowed toward the glass roof. To tour these mile-long galleries was, if one believed in progress, to rejoice in man's victory over nature or, if one did not, to witness the spectacle of pride running before a fall. Here industrial Europe displayed itself at its most vainglorious. There were machines of every order and dimension: textile machines, compressed-air machines, coal-extracting machinery, railway equipment, electric dynamos, hydraulic lifts. There were locomotives and large-scale models of those railroad stations that enshrined the nineteenth century's architectural befuddlement. There was a show on the History of Labor, where working-class visitors (those who could afford the price of admission) were given to understand that they did not lack basic necessities but had, on the contrary, earned enough since 1848 to afford the clothes, utensils, and gadgets laid before them in grotesque profusion. Beneath this glass roof nothing gainsaid Louis Napoleon's optimism, not even a fifty-eight-ton steel cannon made by Krupp of Essen for Wilhelm of Prussia. With political reality suspended for the moment, inklings of doom were as unwelcome as early impressionist paintings. Tourists pressed on heedlessly, orbiting through Wonderland until their journey led them to the outermost ring, where they restored themselves in cafés and restaurants. To Epicurus Rotundus, a pseudonymous Englishman reporting for *Punch,* nothing about the Palace of Industry was so clearly reflective of its nature and purpose as the garden around which it had been built. "My dear Sir, the heart of this garden, the center of all these monster rings, which made you feel as if you had got into Saturn, was a little money-changing office. I like this cynicism."

Eiffel's advocates had given him the task of conducting experiments to test the elasticity of structural iron pillars. By the time the Exposition opened, he had also accomplished the design of a large aquarium (called "Neptune's Realm") and engineered the skeleton of a gallery five hundred meters long reserved for art and archaeology. His work earned him an invitation to the ball held for eight thousand notables at the Hôtel de Ville on June 8. "The two emperors, the king of Prussia, and

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every imaginable highness will be there and I've ordered for the occasion an outfit befitting a courtier—tight-fitting trousers with silk stockings and pumps," he wrote to his parents. "Marguerite [his wife] is also quite excited; she will certainly never have seen nor will ever see again anything so splendid." Intoxicated by this grand festival and buoyed by the memory of Suez, Eiffel was not to be deterred by sober counsels from taking a longer leap into the entrepreneurial void. With borrowed money, he rented hangars just outside Paris, built a house on an adjacent parcel, bought the equipment of Pauwels's bankrupt plant at knock-down prices, and opened shop as "G. Eiffel, Ateliers at 48 Rue Fouquet in Levallois-Perret near Paris: Metallic Doors and Pneumatic Foundations, Iron Frameworks, Gazometers, Boilers and Generally All Metallic Constructions."

Barely enough business dribbled in to keep him afloat until the chief engineer of the Orléans Railroad Company, Wilhelm Nordling, whom Eiffel knew from Bordeaux, recruited him to build two viaducts. One of them, at Rouzat, presented formidable challenges. Though much shorter than the Bordeaux bridge, it spanned a deep valley in the Auvergne. Here, Eiffel, no longer relying upon another engineer's technical ingenuity, proved his mettle, in every sense. Max de Nansouty, a devoted confrère, would applaud him for having shown "how different kinds of iron can be combined in large structures to achieve both resistance and lightness; how straight-beam bridges can be wheeled out into space at dizzying heights with great precision by means of levers and the tipping slide he invented; and, finally, how, when mountainous terrain doesn't allow scaffolding, one builds piers up from the chasm floor by winching parts down from the beam they will eventually support." Eiffel's innovations were many. There would be more. But like the elegance of his own person, the looks of what he engineered also mattered to him. "[The viaduct across the Sioule river] is certainly one of the most beautiful works I've made until now and also one of the boldest," he wrote to his mother, sending her photographs of his high-slung creation.

Eiffel commanded respect. He was on terms with men of influence. He could deal directly with France's most important iron and steel manufacturers. He acquired capital in the person of a wealthy young engineer, Théophile Seyrig, his collaborator at Rouzat, who became his business partner. And, thanks in considerable part to Wilhelm Nordling, he had as much as he could handle of building more bridges for the Orléans line. "This gives us a security we haven't enjoyed hitherto, not to mention the fact that Gustave now stands in the ranks of Paris's premier builders," Marguerite wrote to her mother-in-law in 1868.

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After the Franco-Prussian War and the two sieges that destroyed large areas of Paris, Eiffel, with his equipment intact, took up where he had left off, but reaching far beyond France. During the 1870s, Eiffel & Co. built railroad bridges in Peru, Spain, Portugal, Rumania, Indochina. It built gasworks high up in the Andes at La Paz and a breakwater in the (then-)Peruvian port city of Arica. Churches on either side of the Pacific originated in Eiffel's workshop, along with railroad stations at

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Santander and Budapest, the Lycée Carnot, the casino of Sables-d'Olonne, and Paris's first department store, Le Bon Marché, whose soaring central atrium is the stage set for Zola's *Au bonheur des dames.* It patented a portable bridge used throughout the colonies. And in 1881, it produced the framework of Bartholdi's Statue of Liberty. There were several lost causes, a notable one being Eiffel's design for the new observatory in Paris. But lost causes were the exception. By 1884, when his company drafted early plans for a thousand-foot tower, his name, stamped in structures all over the world, was synonymous with iron.

Among great Eiffelian structures eclipsed by his tower, the one that most clearly prefigures it is the Garabit viaduct in the Massif central, a railroad bridge half-a-kilometer long whose central piers, reinforced by a sweeping, crescent-shaped truss, support a girder four hundred feet above the Truyère river.* Where river valleys could suddenly become wind tunnels, the vagaries of weather dictated design, and for help in this domain Eiffel relied heavily upon the calculations of a brilliant young assistant named Koechlin. Koechlin would play an important part as well in designing the Exposition tower—so important, indeed, that the tower might just as rightly have borne his name.

Broadly speaking, the structure was not one man's creation but a child of a century obsessed by the idea of a thousand-foot tower. It had begotten at least three unrealized projects with which Koechlin must have been familiar. In 1832, when the Reform Bill became law in England, a Cornish mining engineer, Richard Trevithick, proposed for national subscription a monument commemorating the event "by the erection of a stupendous column, exceeding in dimensions Cleopatra's Needle, or Pompey's Pillar, and symbolic of the beauty, strength and unaffected grandeur of the British Constitution." When, in 1852, the House of Commons voted not to save Joseph Paxton's Crystal Palace, an architect named C. Burton proposed that iron and glass salvaged from the demolition be used in a cluster of telescoped towers rising a thousand feet. Two decades later, the Philadelphia Centennial celebrating American independence inspired the design for a tapered thousand-foot tower replete with viewing galleries and four elevators running up a central shaft thirty feet in diameter. "Whenever men have become skilful architects," John Ruskin wrote in *Lectures on Architecture and Painting,* "there has been a tendency in them to build high; not in any religious feeling, but in mere exuberance of spirit and power—as they dance or sing—with a certain mingling of vanity—like the feeling in which a child builds a tower of cards." A "certain mingling of vanity" understates the Darwinian crowing of *Scientific American* in an article about the Philadelphia project: "As did the descendents of Noah, so propose we to do . . . And to its prototype, Babel, a pile of sun-dried clay which the authorities assert, at the hour of the confusion of tongues, had not attained an altitude of over one hundred and fifty-six feet, the graceful shaft of metal, rearing its summit a thousand feet above the ground, forms a fitting contrast, typical of the knowledge and skill which intervening ages have taught mankind."

The millennial demon visited Koechlin on June 6, 1884, when he crudely sketched

*One admirer of the Garabit viaduct was Le Corbusier. As a young architect he wrote to Eiffel with questions about it.

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a tower and, next to it in vertical sequence, seven famous monuments—Notre Dame cathedral, Saint Peter's, the Statue of Liberty, the Vendôme and Bastille columns, the Arc de Triomphe, and the Luxor obelisk. Piling Pelion on Ossa was no mere fantasy. His mathematical calculations as to weight and wind resistance convinced him that the fabled height could be reached. Another Eiffel engineer agreed, but Eiffel himself demurred. Wary of a dangerous enterprise, he had serious misgivings about throwing pride and money into a short-lived structure. Even if the tower stood, it would last only as long as the Exposition itself, and ephemerality didn't sit well with him. But three months later, he and Koechlin obtained a patent for "a new scheme rendering it possible to construct metallic piers and pylons more than three hundred meters in height." What explains this about-face? It is thought that with the refinement of Koechlin's design, Eiffel's imagination caught fire; that the adventurer in him, overruling the prudent bourgeois, decided to risk it and to win a contract on his own terms. There would be competition, but he could marshal behind him a group of influential men. As early as October 22, 1884, *Le Figaro* was touting Eiffel's custom. "Among the most extraordinary projects born of the announcement that another Universal Exposition will be held in 1889 is that of an iron tower three hundred meters tall. It is on the drawing-board of M. Eiffel, the builder well-known for his bold modern constructions and notably the Garabit viaduct. This tower on the fairgrounds would stand twice as tall as the highest monuments in the world." Three months later, *Le Temps* followed suite with a front-page article contending that an industrial fair needed new, extraordinary proportions. "The grandiose is called for. Everything that has been done hitherto seems small. Industry must push the ultimate limits of the materials it uses. Among the new projects to which this presumption has given rise, we call attention to the one that bears the name of M. Eiffel, whose artistry in iron is the object of universal admiration."

Certainly, political sentiment helped Eiffel warm to the prospect of having his creation arch over the Centennial fairgrounds. Although Uncle Mollerat would not have found his nephew's republicanism radical enough, it was by no means limp-wristed. He had provided his bona fides on the municipal council of Levallois-Perret during the 1870s, when members repeatedly demanded the separation of church and state. In 1884, a colleague through whom he ventriloquized, Max de Nansouty, dressed his skeletal tower in the rhetoric of republican triumphalism. Echoing Condorcet's *Esquisse d'un tableau historique des progrès de l'esprit humain* ("Outline of an Historical Tableau of the Progress of the Human Mind"), in which the eighteenth-century philosophe foresaw a universal language emerging from the Revolution, Nansouty declared that the confusion of tongues that dooms its biblical ancestor would not affect "this Babel of modern industry," for its language would be "the universal language of humanity making a common effort to achieve boundless progress and measured freedom."

But ideals aside, professional pride is what ultimately motivated Eiffel. No one explained with greater relish the anatomy of his virtual behemoth. Its piers, he wrote, introduced a method of construction all his own, using curved edges to blunt the wind's cutting edge. "Before coming together at the high pinnacle, the uprights

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appear to burst out of the ground, and in a way to be shaped by the action of the wind." Knowing that judges disposed to admire his engineering against wind resistance might still be reluctant to commission a display of technology for its own sake and to let it stand longer than necessary, he equipped it with practical purposes. It would serve as a sentinel in time of war and a scientific workshop in time of peace, giving meteorologists and astronomers an incomparable observatory. And as we have seen, Eiffel also vested pride in the looks of his work. Technology for him was inextricably bound up with an aesthetic creed amalgamating form, material, and function. "The fact is that this tower resembles nothing known, which is why certain architects reject it," he wrote in 1886 to Adrien Hébrard, director of *Le Temps*. "Being made of iron, it exemplifies no architectural style—neither Greek, nor Gothic, nor Renaissance; its form rationally comports with the nature of its materials." At the École des Beaux Arts, where, in his words, one "learned very little about iron," iron was a pariah. "It eludes [architects trained there]. But they will eventually accept it, just as engineers have done."

Competition came from Jules Bourdais, architect of the Trocadéro Palace and darling of the Academy, who had his own three-hundred-meter tower to propose: the "Sun-Column," as he called it. A granite shaft eighteen meters in diameter, sheathed in spun copper, surmounted by a beacon powerful enough to light all of Paris, and built on a foundation large enough to house a museum of electricity, it would rise above the Esplanade des Invalides. Each of five levels would have sixteen rooms, in which penurious invalids likely to benefit from diminished atmospheric pressure could undergo "aero-therapy." The architect dismissed the engineer as a philistine unworthy of consideration. He claimed that Eiffel's metal tower would weigh almost eight times more than his stone column. It would make Paris a prime target for lightning bolts. And officialdom couldn't grant it longevity since iron was inherently corruptible. If Greek and Roman monument-builders had worked with iron rather than with stone, would anything remain of classical antiquity? As for Eiffel's contention that the tower would "personify the modern engineer's art and a century of industry and science for which the groundwork was laid by the Revolution of 1789," the Centennial deserved better. It deserved art, real art, an architect's art.

These contestants jousted furiously. While Eiffel refuted Bourdais's argument point by point before the Society of Civil Engineers, citing the troubled history of the Washington Monument, architects heaped scorn on Eiffel in their trade journal, *La Construction moderne*.* Dogged efforts were made to influence the administration. Eiffel put his case to Alphonse Alphand, director of public works for the city of Paris, whom he had known since 1867; Bourdais, in turn, lobbied Édouard Lockroy, minister of commerce and industry, whom he mistakenly believed to favor his design. Lockroy played a Machiavellian role in the politics that ultimately rewarded Eiffel. Well acquainted with technical reports describing the "Sun Column" as no match

*Political and structural problems plagued the Washington Monument. The cornerstone was laid in 1848 but construction halted ten years later, for lack of funds, and resumed twenty-one years after that, in 1879. Stone from different quarries mark the hiatus. The foundation had to be redesigned and the monument moved, at one point, to firmer ground.

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for the forces of wind and gravity, but careful not to offend academic pooh-bahs by rejecting it outright, he invited wider participation, set a draconian deadline, received 107 proposals all told, and quickly herded them through a gauntlet of committees. On June 12, 1886, Eiffel's, the preordained winner, won.

Already rich, Eiffel stood to become much richer after negotiating a brilliant contract. Unless neighborhood residents who had initiated a lawsuit succeeded in blocking construction and, for that or any other reason, the tower was not completed by April 1, 1889, he would pocket all income from its business operations for twenty years. Moreover, the government provided an "indemnity" of 1,500,000 francs.

It all began with concrete foundations, gravel laid in clay soil, and beds of masonry reinforced by bars of puddled iron to cramp the stone together. Hydraulic derricks and winches positioned parts lower down. Once the tower's first platform had been hoisted and bolted to its pillars, heavy lifting was accomplished by a steam crane sitting on the platform's girders. This spectacle enthralled Paris for twenty-six months. Eighteen thousand numbered pieces traveled from Levallois-Perret to the Champ de Mars with military precision. As time wore on, the workforce employed at ground level dwindled to a much smaller crew high above Paris—so high that their welding was almost inaudible, and so often obscured by low-lying clouds or autumn fog that the tower seemed to be rising of its own, like a gigantic stalk. Except for forges glowing in the sky at dusk, wrote the vicomte de Vogué, one would not have guessed a human presence. Reporters brave enough to ascend the unfinished tower described another scene. "A thick cloud of tar and coal smoke seized the throat, and we were deafened by the din of metal screaming beneath the hammer," wrote Émile Goudeau. "Over there they were still working on the bolts: workmen with their iron bludgeons, perched on a ledge just a few centimetres wide, took turns at striking them. One could have taken them for blacksmiths contentedly beating out a rhythm on an anvil in some village forge, except that these smiths were not striking up and down vertically, but horizontally, and as with each blow came a shower of sparks, these dark figures, appearing larger than life against the background of the open sky, looked as if they were reaping lightning bolts in the clouds."

On Sunday, March 31, 1889, four hundred dignitaries, including Prime Minister Pierre Tirard (who had earlier disparaged the tower as "American" in spirit), gathered for inaugural ceremonies under the tower arch. Framed by an iron semicircle were the Exposition's central Dome, its esplanade, and a statuary fountain featuring a winged *Progress* with enraptured acolytes at her feet. Under the tower itself stood another statuary group, *La Nuit essayant d'arrêter le génie de la Lumière qui s'efforce d'éclairer la Vérité* ("Night trying to prevent the genius of light from illuminating the truth"). Allegorical figures representing five continents as five stages in humanity's quest for enlightenment surrounded the antagonists, Night and Light.*

The tower was complete except for elevators, which would not be installed until the Exposition opened to the public in May. On inaugural day, Eiffel, followed by a delegation, began to climb the 2,731 steps to the summit. Celebrants who had

*Asia, for example, was a languid Odalisque and Europe a scholar pictured with a book and printing press.

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attended too many banquets in political life fell by the wayside at each successive platform, panting from their exertions, but Eiffel, who looked younger than his fifty-seven years, persevered, along with Édouard Lockroy. After more than an hour, the survivors, journalists and politicians alike, crowded onto a small round platform in the campanile. There, at Lockroy's behest, Eiffel unfurled a large flag, and with the tricolor flapping in the wind and cannons below firing a twenty-one gun salute, everyone sang the *Marseillaise*. Afterward, on a lower platform, Tirard promoted Eiffel to the rank of officer in the Legion of Honor. The ironworkers then offered him a bouquet of white lilacs.

History offered him its own bouquet of sorts one day later, when, as we have seen, a threat to the Republic was averted.

*

Public comment on the tower did not argue a neat correlation between taste and politics. Some political conservatives liked it, some republicans found it abhorrent. Among the latter, for example, was Guy de Maupassant, one of whose characters (in the short story "La Vie errante") claims that he fled Paris because of the Eiffel Tower.

> Not only is it visible from every point in the city, but it is to be seen in every shop window, made of every known material—an unavoidable and tormenting nightmare . . . I wonder what will be thought of our generation if, in some future riot, we do not dismantle this tall, skinny pyramid of iron ladders, this disgraceful giant skeleton with a base that seems made to support a formidable monument of Cyclops and which aborts into the thin, ridiculous profile of a factory smokestack.

On February 14, 1887, when it stood no higher than its cyclopean feet, Maupassant had joined forty-six artists and writers in an open letter of protest to Alphonse Alphand, minister of public works. "Writers, painters, sculptors, architects, passionate lovers of the heretofore intact beauty of Paris, French taste has been flouted, French art and history are threatened by the erection in our midst of the useless, monstrous Eiffel Tower, and we protest against it with all our strength and indignation," they declared, presenting themselves as devout partisans of stone.

> We are not being fanatical chauvinists when we proclaim publicly that Paris is unrivalled in the world. Along its streets and wide boulevards, beside its admirable riverbanks, amid the magnificent promenades, stand the most noble monuments to which human genius has ever given birth. The soul of France, the creator of masterpieces, shines from this august proliferation of stone. Italy, Germany, Flanders, so rightly proud of their artistic heritage, possess nothing comparable to ours, and Paris attracts curiosity and admiration from every corner of the universe.

The sacred city was being profaned by Mammon. The "mercantile fantasies" of an engineer were fouling Paris's noble mind. France was becoming more American than America.

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> Do not for a moment doubt that the Eiffel Tower, which even commercial America would not want on its soil, disgraces Paris. Everyone feels it, everyone says it, everyone is profoundly saddened by it, and we are only a faint echo of public opinion. When foreigners visit our Exposition they will cry out in astonishment, "Is this horror what the French have created to display their vaunted taste?" They will be justified in mocking us, for the Paris of sublime gothic, the Paris of Jean Goujon, of Germain Pilon, of Puget, of Rude, of Barye, etc., will have become the Paris of Monsieur Eiffel. To understand our case, one need only imagine a . . . gigantic, black smokestack beetling over Notre Dame, the Sainte Chapelle, the Tour Saint Jacques, the Louvre, the dome of the Invalides, the Arc de Triomphe, humiliating our monuments with its barbarous mass, dwarfing our architecture . . . And for the next twenty years we will see this city, still vibrant with the genius of so many centuries, overshadowed by an odious column of bolted metal.

Published in *Le Temps,* the "Protestation des Artistes" was signed by such guardians of artistic propriety as Ernest Meissonier, Charles Garnier (architect of the Paris Opera), William Bouguereau, Alexandre Dumas fils, Sully Prudhomme, Leconte de Lisle, Charles Gounod, and Victorien Sardou.

But like Joan of Arc, the Eiffel Tower came to reflect even more sharply the ideological rift in fin-de-siècle Paris. While Republican newspapers published panegyrics, *L'Univers,* an important Catholic daily, inveighed against it. Its only point being to reach three hundred meters, the ill-proportioned tower would, like an arriviste forever climbing, always find true height beyond its reach. Naked and pointless, it was dwarfed in every way by the Gothic church. Medieval architects, *L'Univers* declared, accomplished marvels of construction that far surpassed Eiffel's by "raising edifices 150 meters long, covered with stone vaults twenty-five to thirty meters wide, as high as fifty meters, with flying buttresses, with clerestories, with glass all around." And unlike Republican engineers, medieval architects eschewed the work site on Sundays. Was it not on a Sunday that Sadi Carnot, president of the Republic, paid an official visit, and on another Sunday, three months later, with construction still in full swing, that Prime Minister Pierre Tirard inaugurated the tower? Until the very end, the Lord's Day was profaned to meet a deadline. "The point had to be made that this was a completely secular enterprise and that the tower showed no sign of clericalism. The ceremony was entirely civil: no benediction, not the least little prayer, not the least homage to the God of heaven and earth. The republic does not recognize the Creator, and the engineer believes himself to be perhaps the equal of He who made mountains." Hubris would not go unpunished, the paper prophesied. Dominating all of Paris's crosses, the vainglorious tower erected as a symbol of the Revolution would eventually fall or be superseded by a taller structure crowned with the sign of Redemption.

In *Remarques sur l'exposition du centenaire,* the diplomat/author Eugène Melchior de Vogué imagined a dispute between Notre Dame and the Eiffel Tower, with himself as ethereal mediator trying to reconcile the adversaries.* "Things down below, heavy

*Eugène Melchior de Vogué is best known for having introduced France to the Russian novel, the works of Dostoyevsky in particular, which he discovered for himself during a consular appointment at Saint-Petersburg.

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things," his mediator says to the Cathedral towers, "your words are unjust and your view shortsighted. You, pious Gothic towers, why do you forbid your young sister to be beautiful? If an Athenian Greek had been present when master masons were sculpting you, he would have said of you what you say of her today. He would have treated you as barbaric monsters, as an insult to the sacred lines of the Parthenon." Then, addressing the Eiffel Tower: "And you, daughter of knowledge, curb your pride. Your science is beautiful, and necessary, and invincible; but you accomplish little by enlightening the mind if you do not cure the eternal wound of the heart. Your elder has been giving mankind what it needs: charity and hope. If you aspire to succeed her, arrange to found the temple of the new alliance, the accord of science and faith."

But the argument for rational cohabitation could hardly make itself heard. Scorn spoke too loudly, in too many voices. For aesthetes, Eiffel's tower was the grotesque child of the industrial age, desecrating a museological city. For Catholics, it was the sport of revolutionary Nimrods expounding their secularism in Notre Dame's parish with phallic arrogance. And for nationalist zealots, who joined the chorus, the wrought-iron tower incommensurate with everything else in Paris was a tyrannical mutant, a foreigner lording it over the French past and future, a cosmopolite aspiring to universality, a potential instrument of treason. As such, it could only be the invention of "Israel." One Jacques de Biez enlarged upon this idea in *La Question juive: la France ne peut pas être leur terre promise* ("The Jewish Question: France Cannot Be their Promised Land"). Published soon after Édouard Drumont came out with *La France juive,* an encyclopedic, pseudo-erudite tract that enjoyed enormous commercial success, it continued Drumont's work of showing Jews to be ubiquitous saboteurs of the French soul. Eiffel was identified as Jewish. Worse yet, the tower destined to bear his name embodied a Jewish conspiracy.* "I am dismayed, but hardly surprised," wrote de Biez. "There are ideas that spring only from Jewish brains. Only a Jew could have submitted such a project. Only a Jew like the engineer Alphand could have recommended its construction. Only a Jewish ministry like the Lockroy-Ollendorff ministry could have imposed the project." True France was France of the soil. Imposters were rootless. Touted as a sentinel guarding the homeland, Eiffel's tower would, on the contrary, operate as a spy betraying Paris to "hordes from the East." The Jew who "brought it with him from Germany" entered France in the bowels of a Trojan horse.**

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*Gustave Eiffel's great-grandfather, Wilhelm Bonickhausen, had indeed emigrated from Westphalia in the late seventeenth century, settled in Paris, and changed his name to that of a Westphalian mountain range, the Eifel [sic]. There was nothing remotely Jewish in Gustave's family background, however. Nor were the others in this indictment Jewish.

**De Biez quotes from a magazine interview in which Eiffel explains that the tower would be visible, by optical telegraphy, from as far away as hilltop in the Côte d'Or, and goes on to explain how useful this will be for national defense. "That station would be linked by optical telegraphy to the one on Mont Afrique, which communicates in turn with the Eastern Front . . . Should there be another siege of the capital, one would be able to follow all of the enemy's movements from the tower's cupola." Biez comments as follows: "Thus, everything has been plotted in advance by the German Jew Eiffel, even, and above all, a new siege of Paris by the Germans . . . Babel! This monument to the Jew's inexorable internationalism."

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Master and disciple, cofounders of the "National Anti-Semitic League of France," took turns decrying the tower. It had just been completed when Drumont, in *La Fin d'un monde,* drew a parallel between its erection and the trappings of victory worn by Byzantine emperors marching back to Constantinople after disastrous defeats at the hands of Bulgars or Goths. With France's economy in shambles, the three-hundred-meter tower was a comparable deception. And whose interests did it serve? Those of the cosmopolite. "We sons of France would like our mother to face our trials with dignity," wrote Drumont, whose nostalgia for the "organic" city—the higgledy-piggledy of centuries sacrificed to Napoleon III's abstractly conceived capital—inspired his first book, *Mon Vieux Paris.*

> The Cosmopolites, who have substituted themselves for us, don't see things the same way. They absolutely insist that France appear before the universe covered in ridicule. Having been cruelly humiliated isn't enough; it must make itself a laughing-stock by declaring that it has never been so great, so powerful, so daunting, and rich. In all its imbecility, bad taste and foolish arrogance, the Eiffel Tower has risen for the express purpose of braying this message to heaven. It is the symbol of industrialized France. Its mission is to be insolent and stupid, like modern life, and to crush under its mindless height the Paris of our fathers, the Paris of memories, old houses and churches, Notre Dame and the Arc de Triomphe, prayer and glory. This delirium of vanity signals the death throes of a society.

Cosmopolite being a familiar code word for Jew, Drumont agreed with de Biez that the misbegotten tower sprang from the mind of a Semitic race that did not hesitate to desecrate France. And it reflected that mind not only in its lust for money and power, but in its natural penchant for deformity. "With its instinctual hatred of all that has inspired our respect and enthusiasm, with its need to blaspheme, this race is incontestably gifted with eyes for perceiving the grotesque side of everything moving and beautiful," he asserted. "Jewish artists and writers show us the world through lenses that are dirty or askew, lenses that conform to their astigmatic brains and make everything on earth seem deformed, ill-fitted, incoherent, extravagant, and baroque."

Several years later, Drumont presented much the same argument, applying "modern" to Jews as a term of abuse. "In reality, Jews—these Moderns, these ultra-civilized people with their excesses, their fevers, their constant hungering—wreak more havoc wherever they go than Goths and Vandals."* Powerful beyond his numbers, the Jew, like Faust, rode on the devil.

✶

The journalist who had predicted that hubris would not go unpunished was to credit

*Drumont, who wrote the article from Sainte-Pélagie prison, where he was serving a brief sentence for libel, signed it with the *nom de plume* Sylvio Pellico. An early nineteenth-century Italian patriot imprisoned by the Austrians, Pellico is known for his prison memoir. It is ironical that the allegedly "Jewish" features of modernism in Drumont's portrait reappear four years later as symptoms of degeneracy in Max Nordau's famous disquisition on modernism in art, literature, and mores: *Degeneration.* Nordau was a founder of the Zionist movement.

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himself with having been half right. He would see punishment inflicted only four years after Eiffel unfurled a flag over the tower. The tower didn't fall, but its creator did, in a scandal that tarred not only him but the visionary whose accomplishment at Suez had inspired him to undertake epic tasks of his own—Ferdinand de Lesseps. Lured out of retirement by the dream of completing a water circle around the earth, Lesseps became director in 1879 of a company chartered to build an interoceanic canal across Panama. Owing in part to his conviction that the mountainous Central American isthmus could be spanned at sea level, the project proved a colossal fiasco. After years of excavation, nothing flowed between the Atlantic and Pacific but mud and money. Legislators were bribed to approve bond issues, thousands of bondholders were ruined and contractors enriched. Eiffel profited handsomely from the disaster when Lesseps, forced at last to recognize that this canal, unlike Suez, required locks, hired him to design them. By 1890, the company had gone bankrupt. Trials began soon afterward. Ultimately, Eiffel and Lesseps were given prison sentences, which were annulled on appeal. Eiffel forfeited ten million francs. Lesseps, in failing health, died in 1894.

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