PARIS

CAPITAL OF THE WORLD

PATRICE HIGONNET

Translated by Arthur Goldhammer

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INDEED, but it is revealing that Roger Caillois, in his wonderful introduction to the study of the function of myth in general and myths of Paris in particular, also pondered the representations that different cultures have made of the praying mantis. For some, the mantis is diabolical: it has the evil eye. In Rome one said, "The mantis has looked at you." But for the Hottentots, the mantis was a deity that nourished its worshippers. Scientists, for their part, ask why the female mantis eats her mate: is it "out of physiological necessity or pure cruelty and sadism?"[44]

Like the praying mantis, women in Paris—and in particular La Parisienne, be she a prostitute, a pétroleuse, or an ordinary female resident of the capital—have had their mythology known the world over; but that fame has had its price. Many observers—including, curiously, many Parisian women, no doubt afflicted with "false consciousness"—have praised the supposed French pattern of sexual relations (nuanced negotiation and adaptation) and denigrated its supposed Anglo-American counterpart (brutal confrontation and exploitation). But the Parisian myths of woman as superficial and destructive—like the history of women in the capital in 1848 or 1871—do little to support this feeling of superiority.

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Capital of Science

A MYTH THRIVES on the variety and complexity of the facts that it serves to explain. In 1830, for example, the new myth of Paris as the capital of revolution explained to Parisians the trajectory of their political destiny: in the "habitus" of Parisians, in the historical memory they distilled from their actual experiences, all residents of the capital—whether rich or poor, right or left—found the inspiration that enabled them to understand the monumentality of their city. Myth transforms and explains history, but mythical explanations are convincing only if they can be adapted to a diverse range of contexts, some concrete, others ideological—contexts with respect to which myth functions simultaneously as cause and effect.

And what was true of the political history of the capital was also true of its scientific renown: there can be no chrysalis without a cocoon, material and ideological. Later Parisian politics needed the memory of 1789 as a point of reference. The myth of Paris as the capital of world science from 1800 to 1840 needed a material base (its world-famous scientific institutions like the Muséum d'Histoire Naturelle, the Ecole Polytechnique, and the Faculté des Sciences of Paris). But just as critically, it also depended on the prestige that science enjoyed, both in the city itself and in the entire North Atlantic world.

This was a crucial conceptual frame. Alexis de Tocqueville believed that the politics of his own time, especially the protest politics of democrats and social democrats, was a kind of new religion; and, *mutatis mu-*

tandis, the same thing can be said of science in the nineteenth century: the ideologized and scientific aura of Paris, supported by its material and scientific institutions, also derived from a quasi-religious sentiment. Viewed from the standpoint of the history of science, the lives and ideas of the era's Parisian scientists were not merely a chapter within the history of Paris or even that of France; they also marked "a time and a place crucial to the history of science and Western humanity when science sought to make itself the possessor and master of men."[1]

HERE EVERYTHING was (as always) intertwined: like Paris itself, science stood at the heart of the Enlightenment idea of culture, so that it was almost inevitable that this city, already a political and cultural capital, would become a scientific capital as well. Before the Revolution of 1789, science, literature, and the arts in Paris were part of a unified whole, a single and unique culture: that of the enlightened *honnête homme.* Rousseau was an ardent botanist, and d'Alembert was not only a mathematician but an amateur musician and the author of a celebrated work entitled *Essay on the Liberty of Music* (1759), in which he sought to grant each musical genre its place in the sun. Voltaire prided himself on his ability to understand astronomy and explain Newton. (His friend Mme du Châtelet, Newton's translator, wrote a book entitled *The Institutions of Physics.*) Readers of Linnaeus did not distinguish between his style and his system but admired the confluence of his diverse talents as botanist, physician, and classifier, which made his work so much more convincing than the drier writing of his fellow botanist Antoine de Jussieu.

The myth of science, rationality, and mechanics, of a universe created by the Great Watchmaker and made comprehensible by the application of pure reason, enjoyed wide currency in the eighteenth century, and in every domain. Etienne de Condillac's eloquent title *L'Homme machine* (Man as a Machine) speaks volumes. When the First Consul asked the mathematician and astronomer Pierre-Simon de Laplace (born a marquis) what role God played in his system, Laplace replied that God was a hypothesis he did not need: the celestial machine functioned perfectly well without it.

It would be possible to multiply examples of this pan-European mechanistic mind-set: the *Kriegspiel* of Frederick the Great in Prussia sought to turn war into a scientific exercise, and what was Pierre Choderlos de Laclos's *Liaisons dangereuses* if not a Parisian and quasi-scientific manual of seduction, a compendium of mathematically infallible recipes for sexual success in the salons of the capital? To the Parisian way of thinking at the end of the Enlightenment, all lives, public or private, were data to be deciphered, hence potential objects of scientific (and soon sociological) knowledge. Emblematic of this way of thinking were various chess-playing machines, many of them of Swiss or Parisian manufacture (and on display today at the Musée National des Arts et Métiers), even if these devices were not machines at all but containers in which it was possible to conceal a child, a midget, or an amputee in such a way as to dupe credulous idolaters of rationality.

The Physiocrats, on the right end of the Enlightenment's cultural spectrum, believed that science, nature, economics, and politics together constituted a single whole, which they set out to delineate. Out of that effort came the modern field of statistics.

In the center, Condorcet, who was a marquis before becoming a Girondin deputy and then falling victim to the Terror, was also a scientist, a mathematician, an analyst, a mechanic, and even an astronomer. Among other things, he wrote about the inclination of the ecliptic and the three-body problem and "applied the calculus of probabilities to what we would call the social sciences."[2]

And on the far left, meanwhile, Jean-Nicolas Billaud-Varennes, a Montagnard with sansculotte leanings, explained politics to the Convention in terms of mechanics: "In government as in mechanics, anything that is not precisely assembled in terms of both number and extent will be hindered in its operation, leading to total disintegration."[3]

IN PARIS from 1750 to 1840, therefore, science, mechanics, universalism, and progress were terms whose meanings overlapped. The prestige of one carried over to the others. Parisians were convinced that cultural and social progress would inevitably involve scientific advances, of which Paris would—of necessity—be the primary site: to be sure,

Leonhard Euler, the mathematician from Basel who became a professor in Berlin, preferred Saint Petersburg, where, as Condorcet wrote of him in 1783, he simultaneously "ceased to calculate and to live." More typically, however, the astronomer and mathematician Joseph-Louis Lagrange, a native of Turin (and a relative of Descartes), went to Berlin for a time, where he succeeded Euler, but in the end chose to settle in Paris, where he was granted not only an official apartment in the Louvre but also an important position with the Académie des Sciences. Later he became a senator and finally, in 1808, a count of the Empire. An overlap of identity and principles, then, that would survive the Revolution and persist in Paris until roughly the Second World War: from 1789 until the relatively recent advent of ecological politics, the entire culture, but especially the left, not only in Paris but throughout Europe, would be resolutely scientistic.

For Marx, the scourge of utopian socialism and the inventor of scientific socialism, technological know-how set the pace of historical progress, of which Paris was the political laboratory. Although the author of *Das Kapital* did not actually use the word "technology," he nevertheless believed that the history and progress of mankind were triggered by "machinism" and applied science.

The democratic and republican left largely shared this view. Students of the Ecole Polytechnique defended Paris in 1814, welcomed Napoleon in 1815, and took part in the revolutions of 1830 and 1848. The engineer Gustave Eiffel dedicated his tower to science, and the names of scientists from many countries are engraved in gold letters around the periphery of its first platform, unfortunately in characters too small to be read from the ground. But Eiffel, technical man though he was, also invoked the Republic and even democracy: "I do not believe that I am being vain," he responded to Parisian critics of his work, "when I say that no project has ever been more popular. I have daily proof that there is no one in Paris, no matter how humble, who is not aware of and interested in it. Even abroad, when I travel, I am astonished by the stir it has aroused."[4]

In a similar vein, Georges Clemenceau and Jules Ferry, leaders of the Radicals and the Opportunists respectively, both wrote for the journal *Philosophie positive,* which was founded by Emile Littré and Grégoire

Wyrouboff in 1867. The political implication was obvious enough when in 1873 Littré approvingly quoted a text by the English historian Thomas Buckle to the effect that "in eighteenth-century Paris [that is, just before the French Revolution] enormous crowds attended scientific meetings; halls and amphitheaters were no longer large enough to hold the audience."[5] The parallel Littré had in mind was clear: Paris, already a scientific center in 1773, invented the Revolution shortly thereafter. Hence to anyone capable of reading history, Paris, hailed (optimistically) as a center of science in 1873, also heralded the coming triumph of republicanism in his own time. To no one's surprise, Jean Jaurès—the patron saint of applied socialism in France—proclaimed that "science is naturally republican"; and it was the Dreyfus Affair that brought together the group of physicists (Perrin, the Curies, Langevin) who dominated French scientific institutions of the final decades of the Third Republic.

One member of this group, Emile Borel, deputy director of the Ecole Normale Supérieure, was also a radical socialist deputy; in 1920 he created the Confédération des Travailleurs Intellectuels (Confederation of Intellectual Workers) to encourage progress "of the entire country toward a technological organization and a regenerated politics." In 1936 Jean Perrin, the official philosopher of the Popular Front and a man blessed, we are told, with "all the appropriate credentials," insisted that "liberation through Science . . . [is] a goal worthy of our Republic." In a report on plans to create a Palais de la Découverte (Palace of Discovery) in Paris in connection with the 1937 World's Fair, he wrote: "Over the centuries we see not only a parallelism in the specific research programs of the sciences, the arts, and even letters but also a concordance of anxieties, a superposition of simultaneous curiosities, a mutual assistance profitable to all." His Palais was built, and in a speech delivered at the Sorbonne to the Congrès du Palais de la Découverte, this representative scientist concluded on an enthusiastic note by welcoming to this Parisian palace of science his fellow "scientists of the world, on whom (as it is our duty to say without false modesty) the future and happiness of all mankind depend"—a statement that would have puzzled the inhabitants of Hiroshima in 1945.[6]

Indeed, in 1936 scientific imperialism seemed, to those on the left, so

insignificant a threat that Perrin's colleague Michel Florisoone of the Direction des Beaux-Arts could recommend that the décor of the Palais de la Découverte be chosen to embody a "global aesthetic" whose purpose was to encourage "theoretical and practical exchanges" between science and the fine arts. Thus the visitors, after learning about the scientific theory of color (from the work of Eugène Chevreul, the inventor of organic chemistry, to that of James Clerk Maxwell), would be led to a series of paintings, mostly by Parisian artists (Monet, Seurat, Signac, Van Gogh, Picasso, Gris, Braque, Picabia, and Delaunay), which they would now be better equipped to understand. Similarly, sculpture by Herbin and Henri Laurens, complemented by models crafted by Gropius and Le Corbusier, would serve as "authentic sketches in geometry." And the playwright and essayist René Daumal (1908–1944) hoped to counter the irrationality of Nazism by "restoring science to the place of honor it deserves in a fundamental and real culture." All this, of course, was to be done in Paris, still the capital of the free world.[7]

Progressive Parisian science was therefore dominant, but, it must be added, not wholly hegemonic. In (futile) reaction to its domination, many nineteenth-century Parisian conservatives, especially religious conservatives, were suspicious of science and its leftist practitioners. Of course some brilliant scientists were politically on the right. In this connection it is customary to mention Augustin Cauchy (1789–1857), a legitimist baron born in Paris and celebrated as early as 1811 for his studies of regular polyhedra. Despite exceptions of this kind, however, most right-wing (or in any case extreme-right-wing) politicians were hostile to science and especially to the lessons that their progressive antagonists wished to draw from science.

The timing of anti-scientific reaction in Paris varied: for some conservatives and reactionaries, 1793 and 1794 were more than enough. Thus Antoine de Rivarol, in a 1799 pamphlet, was critical of the analytical obsessions of those heirs of the Enlightenment, the Idéologues, and of their destructive political program. At about the same time Jean-François La Harpe spoke in praise of the old scholasticism and Joseph de Maistre asserted that science cannot tell us what is truly important.[8] But other conservatives did not declare their opposition to science until

Darwinism and positivism reared their (simian?) heads: Ernest Renan's *L'Avenir de la science* (The Future of Science; 1848) was a bible for some, but it soon became a new quintessence of evil for others. So it was that Renan's contemporary Louis Veuillot in his *Odeurs de Paris* said he "always thought it was perfectly fine to ignore physics and chemistry. I have clearer ideas as a result, and I waste no time in changing systems."[9] After Hippolyte Taine and Renan died, Ferdinand Brunetière wrote three articles grouped under the title "La science et la religion," the first of which bore the programmatic subtitle "Après une visite au Vatican." "If free thought rested its hopes on the idea that science would become a religion," Brunetière intoned, "indeed the only religion, it is becoming clearer with each passing day that it will have to give them up." His primary target was his fellow Parisian Marcelin Berthelot, the "illustrious" Collège de France scientist who had said that "the universe holds no more mysteries."[10]

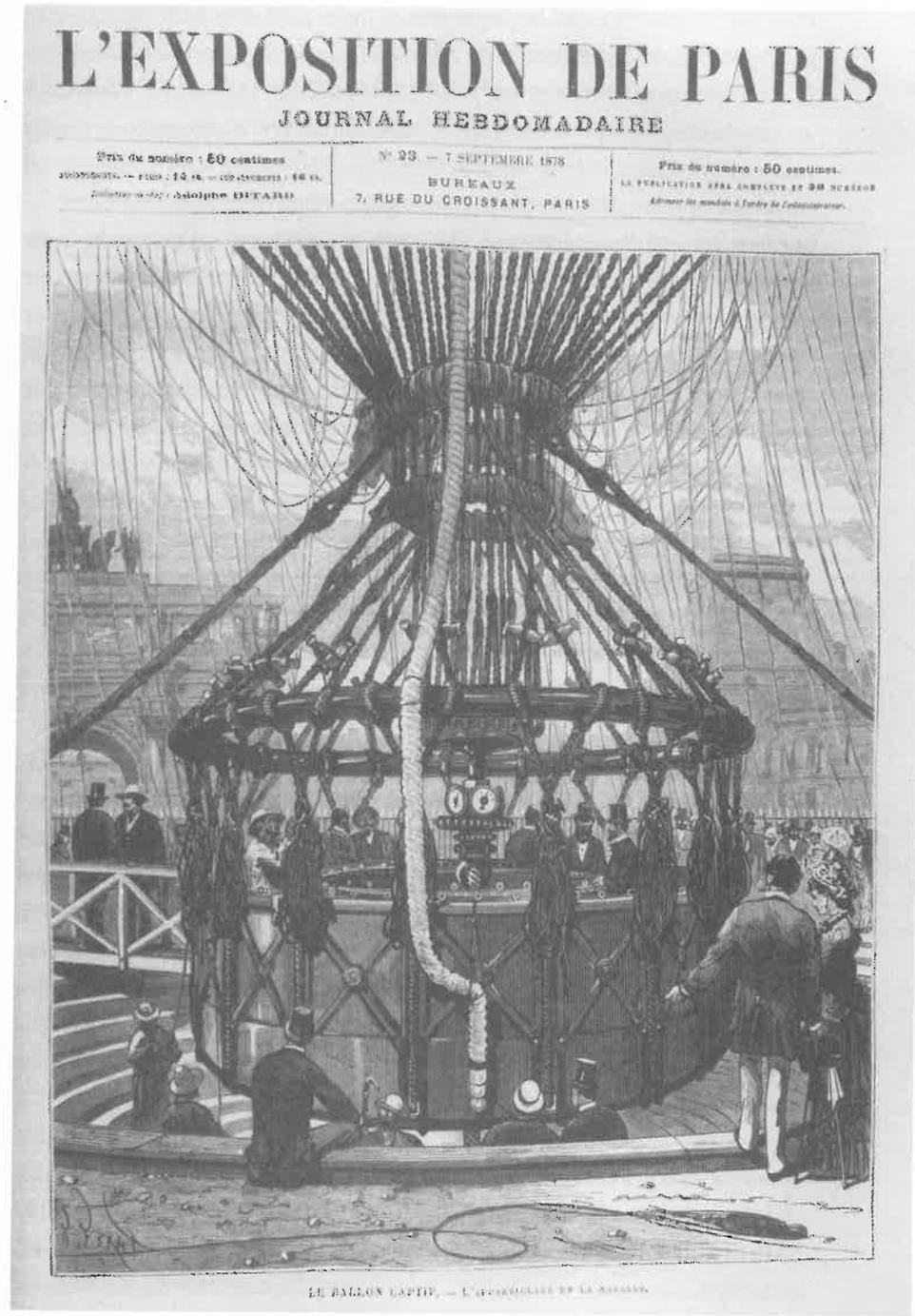
BUT THESE WERE VOICES in the wilderness, and in Paris from 1750 to 1950 science was a child of the Enlightenment successfully supported by the left, by the state, and by many rich Parisians: on the eve of the Revolution the city counted more than 200 private natural history collections, owned by persons as diverse as Cardinal Edouard de Rohan; the marquis de Marigny, Mme de Pompadour's brother who was superintendent of royal buildings; the atheist philosopher Paul-Henri d'Holbach; the comte d'Angiviller, who succeeded Marigny as superintendent of royal buildings; the financial minister Charles-Alexandre de Calonne; the actress Claire-Joseph Clairon; and the Prince de Conti.[11] Mention should also be made of the Athénée, or "Musée," created in 1781 by Jean-François Pilâtre de Rozier, who supervised the physics collection of Monsieur, the king's brother. Pilâtre was an intrepid aeronaut as well as a physicist; as history's first aviator, he flew, accompanied by the marquis d'Arlandes, at an altitude of 1,000 meters from the Château de la Muette to the Butte-aux-Cailles in a hot-air balloon—a balloon made in Paris on the rue de Montreuil, in the Réveillon wallpaper factory that was to become the scene of the first riot of the

Revolution in April 1789. Pilâtre soon thereafter crashed and died, a victim to his passion for flying, but the chemist Antoine Lavoisier reorganized his Musée, which was renamed "Lycée" in 1785, and before long there were three of them, and the Lycées became known as "antechambers to the academies."[12]

Science also had an important place in the capital's salons, where, for instance, Franz Anton Mesmer's experiments with animal magnetism and hypnosis became social events. On the eve of the Revolution, electricity was all the rage in the capital. Jacobins were not alone in believing that "the friction of ideas" could have beneficial consequences.

Some salons were in fact more scientific than literary. Lavoisier fell victim to the Revolution; but after 1800 his widow, remarried and now known as Mme de Rumford, presided over a salon that was probably the capital's leading scientific venue. Her contemporary Alexander von Humboldt (1769–1859), the author of *Cosmos* (which the Catholic nationalist Veuillot judged to be a "well-written book, at least in German"), also lived in Paris for several decades, where he was not only a powerful scientific personage but also a prominent socialite, adept at conversation in the Parisian style. "Sometimes he talked about science," wrote Jean-Baptiste Dumas, "and then astronomy and physics and the various branches of natural history would succeed one another in the dialogue, or, rather, monologue . . . delivered in a slow, somewhat monotonous voice." (Incidentally, Humboldt, a Parisian Prussian, also used his social influence to see to it that Jacques-Ignace Hittorf, a Parisian Rhinelander from Cologne, was awarded the commission to rebuild the Place de la Concorde.)[13]

And Dumas (no relation to the novelist), who eventually became the principal pillar of the "state scientific apparatus" in nineteenth-century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Phallic top hats were everywhere in mid-nineteenth-century Paris, in the paintings of Manet, for example, and in this scene from the Universal Exposition of 1878. Balloons were also prestigious. In 1870 it was in a balloon that Léon Gambetta escaped a besieged Paris to lead the resistance to the Prussian invaders. And this balloon of 1878 seems pleasingly complex, sturdy, and scientific. It is tethered to the earth in the Cour du Louvre, now the site of I. M. Pei's glass pyramid. The Burndy Library, Dibner Institute for the History of Science and Technology, Cambridge, Massachusetts.

Paris, also moved in the upper strata of society. Isidore Salle, the author of *Histoire naturelle drolatique et philosophique des professeurs du Jardin des Plantes* (Natural, Recreational, and Philosophical History of Professors at the Jardin des Plantes; 1847), tells the story of Dumas's irresistible rise. Although ill at ease in public initially, the young provincial from Alès "worked with such perseverance that within a few years he became an excellent professor. His speech acquired elegance: he now spoke clearly and precisely and at last learned to profess properly, or nearly so."[14]

In this period, then, the propagation of scientific ideas in Paris took place in private as often as it did in public. Arcueil, for example, became an important quasi-official center of scientific research because the chemist Claude Berthollet decided to buy a house and set up his laboratory there in 1801. (Joseph-Louis Gay-Lussac would be his first assistant.) In 1806 Laplace also moved there, and in 1807 a Société d'Arcueil was established, a private but also public entity since Berthollet received a subsidy of 150,000 francs from Napoleon in 1807. (Berthollet was a senator as well as a scientist, and as such received an annual salary of 22,000 francs plus the use of the erstwhile episcopal palace of Narbonne.)

The Société d'Arcueil eventually boasted as many as fifteen members, nine of whom became correspondents of the London Royal Society. These Parisians published research reports in 1807, 1809, and 1817 and met every other week (except in December and January because of the harsh winter weather and the distance between this then-remote suburb and the capital) until the 1820s. The English scientists Humphry Davy and John Dalton met with their colleagues in Arcueil, whose Société exerted a substantial influence on the evolution of the Ecole Polytechnique.

IMPORTANT AS SUCH private or semi-private associations were, the direct support of Parisian science by the machinery of state (whether in the hands of the right or the left) was yet more crucial. One can conceivably imagine Delacroix painting *Liberty Leading the People* without

the support of Louis Philippe or the approval of the salons, but it is difficult to imagine scientific research in Paris without the Muséum d'Histoire Naturelle or the Académie des Sciences or even the Sorbonne, and it is particularly revealing that the relations between science and the state were already close in the seventeenth century.

The ancien régime can be imagined as a deeply schizophrenic political system. To be sure, the regime's role in modernization was the less visible of its two faces. What one saw in Paris was primarily the ceremonial aspect: royal entries, the birthdays and weddings of princes of the blood, the court etiquette, and the close relationship of church and state. All of this constantly reminded the subjects of the Most Christian King that the ritual of monarchy was the embodiment of all the ancient traditions of the French nation and also that their monarch was descended from two saints, Charlemagne and Saint Louis.

Gradually, however, this medieval conception of shared sovereignty developed a new offshoot, which grew vigorously from the time of Richelieu: a second, far more important monarchy, administrative rather than ceremonial, efficient and rationalized in its operations, which involved dossiers and censuses and functionaries and intendants and councils, some of which still exist today. This (somewhat confused) vocation of modernity led in 1666 to the creation, by Jean-Baptiste Colbert, Louis XIV's finance minister, of the Académie Royale des Sciences, located in Paris. No other seventeenth-century scientific institution, including the Royal Society of London, a decade older than its French counterpart, received more consistent financial support, a fact that is especially striking because financially the final years of Louis XIV's reign were among the most difficult of the monarchy.

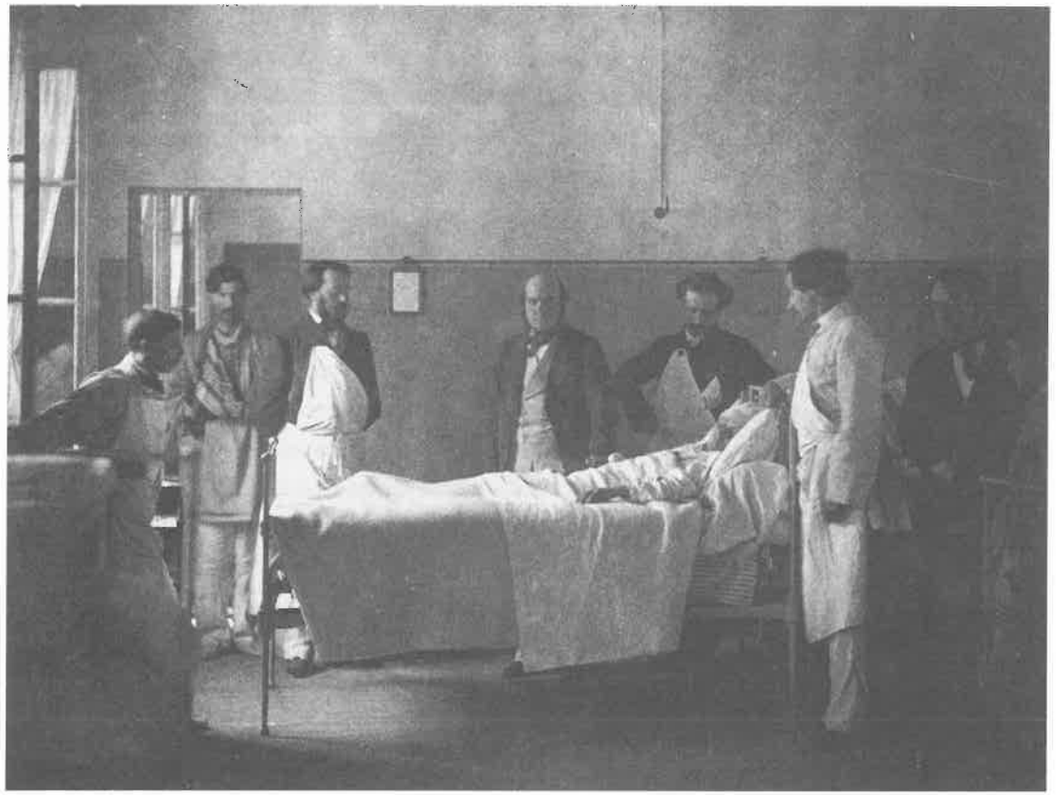
In return for this aid, the Académie dutifully served the state. Parisian academicians accepted the monarchy's imprimatur as well as its subsidies, and in 1699 were even granted a home in the royal apartments of the Louvre, though they had to share it with the skeleton of an elephant dissected by Claude Perrault. Academicians received a space, and the academicians in return allowed the Bourbon monarchy to present itself as a model of modernity and efficiency. In addition, the state looked to its scientists for certain kinds of practical assistance, especially

after the marquis de Louvois replaced Colbert. As the Académie's charter indicated, these official scientists were not to occupy themselves exclusively with "curious researches" or "chemists' amusements"; they were expected to engage in useful research bearing some "relation to the service of the king and the State."[15] They could be cartographers, for instance, and offer advice on matters of relevance to a ubiquitous mercantilist state on subjects ranging from public health and epidemics to the architecture of royal palaces. Meetings of the Académie des Sciences, though closed to the general public, drew wide public attention, and Louis-Sébastien Mercier noted that "nowadays even the most insignificant of artisans comes with blessings from that illustrious body."[16]

The eighteenth century is sometimes thought of as a time of titanic struggle between an obscurantist state (Voltaire's *l'infâme*) and the forces of the future, of the Enlightenment, whose triumph would come at last in 1789. This reading relies too heavily on the judgment of the revolutionaries themselves, and it neglects the many ways in which the monarchic state was powerfully allied with the forces of Parisian modernity, not only in science, but also in the realm of letters. Speaking for his colleagues in the Académie Française a century before the Revolution, the playwright Jean Racine had gone so far as to say that "all the words of the language, all of its syllables, seem precious to us because we look upon them as instruments to serve the glory of our august protector."[17] Voltaire was a less dithyrambic but equally polished courtier, not only in Potsdam with Frederick the Great but also in France, where, as a protégé of Mme de Pompadour, he obtained the post of royal historiographer. And speaking of Voltaire, the Montagnard and model revolutionary Abbé Grégoire later called him the "toadying poet of the court and the reigning divinities."

The close relationship between the ancien régime and the academies, those handmaidens of the Enlightenment, ended only with the disappearance of both in the torments of the Revolution: before 1789, Lavoisier, a fermier général or tax farmer (who was guillotined in 1794), and the comte de Buffon, a man ennobled by Louis XV, were both great scientists and men who enjoyed great privileges.

Science and state-sponsored academies; science and educational institutions: the latter link was not as tight before 1789 as it became at the



Charles Nègre, *Imperial Asylum at Vincennes; The Doctor's Visit,* 1860. In our age of digital reproduction, photographs of earlier times have become auratic. This rendition of a Paris hospital seems strangely poetic to us, at once stylized and true, artificial and unique. The solemn physician surely thought of himself as immensely learned. By 1860 many non-Parisian scientists were probably less convinced of this than he was. Philadelphia Museum of Art: Purchased: Smith, Kline, and French Foundation Fund, 1971.

end of the nineteenth century. Yet pre-revolutionary French higher education, in the nation at large and also in Paris, though largely controlled by the Church, was probably less hostile to science than people used to think. The twenty-two French universities included ten faculties of medicine, some of which were world famous. (It was to attend one of them that Laurence Sterne, the author of *Tristram Shandy,* lived for a time in Montpellier.) And in pre-revolutionary Paris anatomy was taught at the Jardin du Roi and at the Sorbonne (which, along with Montpellier, was the birthplace of French physiology). Physics also figured in the curriculum of most pre-revolutionary Parisian *collèges* (sec-

ondary schools), especially those run by the Oratorians. It was not until the middle decades of the nineteenth century that the Collège de France came into its own, yet even before the Revolution (which the institution weathered without undue difficulty) this jewel of Parisian academic life offered instruction in mathematics, physics, experimental physics, astronomy, chemistry, history, philosophy, rhetoric, poetry, French, Greek, Arabic, Persian, and Turkish.

FOR THESE MANY REASONS, the *esprit géométrique* did not await the Revolution to establish itself in Paris, and the Revolution in no way impeded its development. Indeed, the revolutionary spirit, even in its harshest Jacobin variants, was favorable to the development of science, despite the execution of Lavoisier, who died not as a scientist but as a former tax collector. Many Parisian scientists were prominent revolutionaries, such as the astronomer and historian of science Jean-Sylvain Bailly, who in 1789 belonged to three academies and became the first mayor of Paris; Joseph-Louis Lagrange; Laplace; Gaspard Monge; Joseph Fourier; the chemists Antoine Fourcroy and Claude Berthollet; Marat; Cabanis, Mirabeau's doctor; and finally Jean-Henri Hassenfratz, a hardcore Jacobin and scourge of the Girondins as well as an "incompetent professor."[18] In the political life of this so-called bourgeois and mercantile revolution, scientists and publicists were far more numerous and played a far more important role than did bankers, manufacturers, shipping magnates, or industrialists.

Also numerous and popular in revolutionary Paris were applications of new scientific discoveries. For François de Neufchâteau (who would later organize the first Parisian industrial fair), one of the goals of the Revolution was to ennoble the mechanical arts that ancien régime's academies had neglected. As he explained in Paris in 1798:

> These arts, which the ancien régime thought to debase by calling them mechanical, and which had long been left to instinct and routine, are nevertheless amenable to deep study and unlimited progress . . . Diderot hoped that they would have their own academy, but despotism was a long way from understanding him! It saw in the arts only slaves of idle luxury, not instruments of social happiness . . . The commonest arts, seemingly the most simple, are illuminated by the light of science. Mathematics, physics, chemistry, and design applied to the arts and crafts ought to guide their methods, improve their machines, simplify their forms, and, by doubling their success, diminish the amount of labor they require.

One might be listening to a speech by an International Monetary Fund expert to some Third World country today.

So numerous were the practical applications of scientific knowledge that the Convention, responding to a proposal from Abbé Grégoire in October 1794, decided to create a Conservatoire des Arts et Métiers in Paris to serve as "a public repository of machines, models, tools, descriptions, and books of all the varieties of arts and crafts." (Note, by the way, that the full, and premonitory, title of Diderot's encyclopedia was *Encyclopédie ou dictionnaire raisonné des sciences, des arts, et des métiers par une société de gens de lettres* [Encyclopedia or Comprehensive Dictionary of the Sciences, the Arts, and the Trades, by a Society of Men of Letters].) In this, the world's first museum of science, citizen-demonstrators would explain to Parisian citizens how all these things worked, for "there is no citizen who is not interested in the progress of the arts and crafts," an admirable and revolutionary idea, even if its implementation had to await the arrival of Napoleon. By March 1806 a visitor could comment that the Conservatoire "has long been regarded by artists and amateurs as one of the most useful establishments in the French Empire . . . Since it has the advantage of being the only one of its kind in Europe, foreigners (and Frenchmen) are eager to admire and study the various models on display in its galleries."[19]

Nonetheless, the Revolution's chief contribution to the future of science in Paris was not ideological, nor did it have anything to do with the favorable attitude of the revolutionary authorities toward the mechanical arts. Rather, it involved the establishment, or encouragement, of an educational system based on a series of *grandes écoles,* about which opinion has been divided ever since. In the sciences, however, these schools were virtually without equal in Europe or North America for some five decades, until about 1850.

To be sure, the Revolution did not invent the *grandes écoles.* The Ecole des Ponts et Chaussées was founded in 1747 to train engineers under the

direction of Daniel Trudaine, a Parisian, and Jean-Rodolphe Peronnet, a master bridge builder and creator of the sewer under the quai des Tuileries, which can be seen as a trial run for Haussmann's rebuilding of the city's drainage system. Somewhat later, in 1778, the Ecole des Mines was founded in Paris and initially housed in the new Hôtel des Monnaies (Mint), the first building anywhere in the world designed specifically to house those departments of the government devoted to currency, which had previously found space wherever they could in royal palaces and even private mansions.

The Revolution, then, did not initiate but did dramatically accelerate the development of higher education in Paris, with the founding of the Ecole Normale in 1794 and the Ecole Polytechnique in 1795. Monge, Laplace, Louis Daubenton, Constantin de Volney, and Jacques-Henri Bernardin de Saint-Pierre taught in these institutions. Symbolically, it was to the Ecole Polytechnique that Napoleon entrusted the most powerful electrical "pile" or battery available at the time so that its scientists could vie with Humphry Davy in England and Alessandro Volta in Italy.[20]

Parisian science and politics cohabited happily to 1800, and after that as well: Bonaparte's relations with the great writers of the time (Mme de Staël and Chateaubriand) were strained, but his dealings with the scientific establishment were relatively serene. As a student at the Académie Militaire of Paris, he had taken courses in 1785 from Louis Monge (less well known than his celebrated mathematical brother Gaspard) and from the marquis de Laplace, who was one of his examiners before the Revolution and would later serve briefly as his minister of the interior. It was not uncharacteristic that the young general should have searched in Italy for the mercury that the chemist Berthollet needed in Paris, or that Berthollet should have later followed Bonaparte to Egypt, where he joined Monge in directing the celebrated Institut d'Egypte. (There is today in Cairo, as there is in Paris, a rue Monge.) In 1797 Bonaparte himself was elected a member of the Institut National (which had been created in 1795 to take the place of the royal academies), in the section of mathematical and physical sciences, and in 1799 Laplace dedicated the first volume of his *Mécanique céleste* (Celestial Mechanics) to his

young colleague. As president of the section, Bonaparte took care to establish a well-publicized prize for the study of "voltaic electricity."

As one might expect, the emperor's interest in science was not disinterested. He wanted something in return, and in his eyes the primary purpose of science was to serve the state, as is evident from his decision to militarize the Ecole Polytechnique in 1804—a decision against which, as it happens, Monge, Berthollet, and Fourcroy vainly protested. The emperor expected that, like the Université Impériale of 1808, Parisian scientific institutions would, if not pay their own way, then at least produce practical results as well as offer docile political support to his regime. In fact, many scientists, such as Jean-Antoine Chaptal, served in high-ranking positions in the imperial government. Like other authoritarian regimes in France, the Napoleonic regime appreciated the help of prestigious technocrats, who were in theory competent men unlikely to be troubled by pangs of conscience.

In brief, then, during the First Empire Parisian science had become, literally, an affair of state, and we see this in an unusual accord between France and Switzerland, which provided that "twenty young Helvetians shall be admitted to the Ecole Polytechnique of France after taking the examinations prescribed by the rules."[21]

SCIENCE WAS THE PROVINCE of the left. The Restoration situated itself on the right. Yet the emperor's fall had almost no effect on the development of science in Paris. And the period from 1815 to 1835 or so was, paradoxically, among the most brilliant in the history of Parisian science. This was the age of Jean-François Champollion and his study of hieroglyphics; Berthollet and chemistry; the Belgian-born Jacques Quételet and statistics; Jean-Baptiste Lamarck, Darwin's precursor; Etienne Geoffroy Saint-Hilaire and Georges Cuvier (both professors of biology at the Collège de France); Laplace, Lagrange, and Jean-Baptiste Fourier in mathematics. The number of people doing scientific research in Paris doubled between 1775 and 1825. Victor Hugo and Edgar Quinet, before finding their paths in life, dreamed of attending the Ecole Polytechnique, and Stendhal wrote in 1828 that he knew "only

one place on earth where large numbers of young men, as they call themselves, are doing serious work. That is Paris, and the workers are youths who hope to make themselves famous by means of new discoveries in the natural sciences and thus win admission to the Académie des Sciences of Paris, the only good one."[22]

Parisian science, though potentially republican, could not be ignored by the political right; and it continued to thrive in schools, in academies, and, until the death of Geoffroy Saint-Hilaire in 1844, in the Muséum d'Histoire Naturelle, whose origins can be traced back to the old Jardin du Roi. (Founded in 1640 by Guy de la Brosse, a bold innovator in his day and a fierce critic—in French rather than Latin—of Aristotle, the institution had later been directed by Buffon, named to his post in 1739, at the age of thirty-nine. Jacques-Henri Bernardin de Saint-Pierre, the author of *Paul et Virginie,* had held the post in June 1794, when the Revolution transformed the royal garden into a genuine scientific institution.)

The Muséum d'Histoire Naturelle was "without rival anywhere in Europe."[23] Having become a research center, it began publishing its own periodical in 1802. Its library, open to the public, held approximately 15,000 volumes by 1822, and its collection of quadrupeds and birds, which numbered some 1,500 specimens in 1789, had grown to 40,000 by 1820. A chair of comparative physiology was set up there in 1837 for Frédéric Cuvier, the brother of the paleontologist Georges Cuvier. The museum's budget of 300,000 francs was considerable for the time: in 1825 the Académie de Médecine received only 196,000 francs and the Faculté des Sciences only 75,000. The museum's professors were paid 5,000 francs annually, an amount comparable to the (high) salaries paid to professors at the Collège de France. (Workers earned about 500 francs a year in those days.) Buffon's post-revolutionary emulators also lived in official apartments, and Adolphe Thiers, as first president of the Third Republic, offered them even higher pay. Many foreigners sought positions there as well, including Alexander von Humboldt and the Swiss Louis Agassiz, who ended up in the United States as a professor at Harvard University.

A stellar array of talent, which, once assembled, attracted still more

talent. So it was, a bit later, that Jean-Baptiste Dumas, welcoming Joseph Bertrand into the Académie Française, congratulated his new colleague for understanding how much he owed to his predecessors, great men like Alexandre Brogniart, Dominique Arago, Laplace, Cuvier, Geoffroy Saint-Hilaire, André-Marie Ampère, and Louis-Jacques Thénard. And Dumas knew whereof he spoke: hardly had he been chosen to serve as Alexander von Humboldt's secretary when he "began to reflect on the fact that Paris was the only place where, under the auspices of teachers of physics and chemistry with whom I hoped soon to make my mark, I could find the advice and assistance I needed to carry out the work I had been meditating for some time. My mind was quickly made up: I must go to Paris." To Henri-Alphonse Esquiros, Paris was symbolically the book in which his life would be written, and he turned this exercise into a clever history of the capital that began with the Jardin des Plantes and proceeded from plants to animals and then to man and, finally, to the Parisian. Goethe had science in mind as much as literature in his 1827 encomium to Ampère, who had made "something of himself at twenty-four" in that "universal city, where every step onto a bridge or square recalls a grand past" and "where the finest minds of a great empire are gathered."[24]

THERE ARE OF COURSE many reasons for the flourishing of science in Paris in the 1820s and 1830s. One issue not yet mentioned was the city's vampiric relation to the rest of France: very simply, the scientific establishment of the capital thrived in no small part because it had far more and far better endowed scientific institutions than any other French city. Indeed, Auguste Comte, though a native of Montpellier, went so far as to suggest that the concentration of scientific endeavor in Paris was beneficial not only for the growth of institutions but also for the structure of scientific thought, because it encouraged the formation of an "instinct for contemplation and generality."[25]

Although the first signs of "Parisianization" began to appear during the ancien régime (when the Jesuits, for example, acquired the habit of training teachers in Paris), provincial scientists were still numerous be-

fore 1789, and provincial academies, especially the one in Caen, were still important centers. In this respect, as in so many others, the Revolution marks a break:[26] during both the Empire, which was centralist on principle, and the Restoration, which supposedly favored decentralization but did precious little on its behalf, the faculties of medicine in Strasbourg and Montpellier languished. J.-D. Gergonne established his *Annales de mathématiques* in Nîmes and Montpellier, but in 1836 the journal moved to Paris. In Lille Pasteur could draw no more than 250 people to his lectures, whereas at the Sorbonne Dumas taught as many as 1,000.

Provincial scientific institutions were neglected, and it was partly at their expense that the ones in Paris attained new heights. By exercising a "useful influence on [public] opinion," Laplace wrote, the Institut and the academies "dispel errors welcomed in our time with an enthusiasm which in another age would have perpetuated them."[27] Which was an elegant if convoluted way of saying that only the Parisian bourgeoisie, enlightened by its elites, was capable of reasoning scientifically. (The emphasis here must be on elites: when cholera struck in 1832, the residents of the rue Vaugirard stoned a man to death because they believed he had poisoned a fountain.)

THE "STATE SCIENTIFIC APPARATUS," bolstered as it may have been ideologically, culturally, and institutionally by society at large, was not the only thing that encouraged the concentration of science in Paris in the early nineteenth century. Also crucial was another factor that is far more difficult to pin down precisely: the very nature of scientific thought at the time. The politicized place of science in Western culture was one critical factor in the prestige of scientific thought in Paris, but it was complemented by the way science was conceived by scientists, its practitioners.

Today it is obviously impossible for any one nation, let alone any one city, to be at the forefront of every scientific discipline. Indeed, this impossibility had already become apparent by 1850. And it is even more impossible to imagine that every discipline might somehow depend on

a single principle and source of inspiration available in only one place on earth. But in Paris in 1820 people believed just that. The systematic unity of all sciences—which had seemed so foreign to Plato—was taken for granted after 1815 by the Aristotelian subjects of the restored Bourbon monarchs.

Two complementary factors were at work here: first, the diversity of Parisian scientific research, and second, the confidence of scientists that they could absorb it all. From 1750 to 1840 all the sciences were brilliantly represented in Paris: with, for example, Monge, Augustin Cauchy, and the ill-starred algebraic genius Evariste Galois (1811–1832), Paris had the reputation of being the world capital of mathematics. But Paris had also long been a prestigious center of physics, especially noted for work on the relation of physics to astronomy. Bernard le Bovier de Fontenelle (1657–1757), for instance, though no physicist, had preferred "the spirit of physics" ("clearer, simpler, more independent") to both the spirit of chemistry, which was all confusion, and the practice of medicine, which was also dubious. "We anatomists," he wrote in 1722, "are like the lockpickers of Paris, who know even the smallest, most out-of-the-way streets but have no idea what goes on inside the houses."[28]

The Parisian infatuation with physicists would last until the Revolution: in the 1780s Mesmer attracted vast audiences, but Benjamin Franklin was even more popular thanks to his experiments with lightning. Parisian women even began wearing tall hats that were called *chapeaux paratonnerres,* lightning-rod hats, in his honor. And at a more exalted level, Laplace represented the glory of physics at the Institut. It was in Paris, more than anywhere else, that physics became the science that could explain everything from "the clockwork to the boiler," from mechanical description to organic analysis, culminating in the work of Sadi Carnot, who was born in Paris in 1796 and died there of cholera in 1832 after discovering the Second Law of Thermodynamics.[29]

But with all due respect to Fontenelle and his successors, mathematics, physics, and even medicine were not the only important disciplines to thrive in Paris. Chemistry and physiology were also associated with the city, and in a way that greatly reinforced the prestige of the Parisian

scientific establishment: if physiology and chemistry were, as many scientists began to think, the "mother sciences," and if Paris was the best place to study them, Paris would necessarily be the capital of Western scientific thought.

For Diderot, chemistry, as the most analytical of the sciences, had already seemed the most apt to serve as a link between philosophers and empirical workers *(manouvriers de l'expérience)*. In 1783 Mercier praised "the modern miracles of chemistry." Alexander von Humboldt had gone further and made Lavoisier's work a necessary starting point: "It is the portico of the gate to the Temple: the other gates are only ways out." In a letter sent in 1822 to the young Jean-Baptiste Dumas, who, though born in Alès in 1800 lived in Geneva from 1819 until 1822, the Genevan Augustin-Pyrame de Candolle (1778–1841) went straight to the heart of the matter: "Your future is in Paris, [and] chemistry is your career. Botany does not offer you the necessary scope; physiology without chemistry is impossible. It is toward chemistry that you should direct all your strength. You can do chemistry seriously only in Paris." And Balzac, royalist and reactionary though he was, chose chemistry as the science to inspire his César Birotteau, a provincial perfumer on his way to a bankruptcy that would ruin his good name.[30]

On a par with chemistry in Paris was physiology, which at the time included what would today be fields as distinct as pathology, biology, and biochemistry.[31] The scientific writer Jean Sénebier explained all this in 1778 in his eulogy of Albrecht von Haller, the father of modern physiology: "Physiology is the basis of medicine; it presents to the medical practitioner the natural state of the machine he is to maintain . . . This science is a part of physics; it almost requires knowledge of all the others. One has to delve deeply into anatomy . . . One must acquire a solid knowledge of general physics, mechanics, hydrostatics, pneumatics, acoustics, and chemistry in order to understand various phenomena that would be incomprehensible if one were not in perfect possession of the principle of these sciences."[32] This ecumenism was surely overly optimistic, but it bears highlighting because this very sense of wholeness was what most clearly distinguished Parisian science from the way science was envisaged in England or Germany at that time.

As a new science, all but unknown to the general public in 1795, physiology was not entitled to its own section in the Institut National des Sciences, but this gap would soon be filled under the Directory. So well filled, in fact, that the new discipline became the backbone of scientific thinking in the capital during the three or four most illustrious decades of Parisian science, from 1800 to about 1840, with as its most prominent practitioner Xavier Bichat, the author of *Recherches physiologiques sur la vie et la mort* (Physiological Studies of Life and Death; 1800).

The development of physiology was also closely linked to the city's medical institutions. The Académie de Médecine was founded in Paris in 1770, followed by a veterinary school in Alfort in 1776 (which was reorganized in 1784). These pre-revolutionary institutions were reinforced after 1789 by the creation of the Ecoles de Santé in December 1794, along with a college of pharmacy. The institutional strength of Parisian physiology, then, grew rapidly, and all the more so because of the Parisian scientific zeitgeist of the time, with its notion that there existed a science of organic functions that was capable of subsuming all the other sciences from medicine and anatomy to chemistry and physics—a way of thinking that was typically French and that privileged theory over empirical observations.

To be sure, Parisian physicians did not scorn direct experimentation (especially after 1840), but they clearly preferred to work in the realm of medical theory and on the nature of life itself rather than on scientific experiments, and it was only after 1822, when François Magendie (1783–1855) discovered the complex sensorimotor function of the spinal nerve, that Parisian physiology began to move gradually toward sustained experimentation. But Magendie and, after him, Claude Bernard (1813–1878) never abandoned "the idea that organic phenomena have a specific character." In this we see the Parisian tendency toward unifying abstraction, and no more unrepentant apologist for that tendency could be found than Auguste Comte. For the father of modern sociology, the importance of abstraction, the superiority of "speculative genius" over "industrial genius," was beyond argument.

Comte's thinking in 1825 was typical of the unitary and abstract sci-

entific mood that prevailed in Paris at the time. He railed against "the overly pragmatic spirit of the present century," which to his mind was an unfortunate consequence of the undue prestige accorded to the applied sciences. By contrast, it pleased him to observe that "the philosophical spirit as such was . . . more fully developed in France than anywhere else under the theological-metaphysical ancien régime, and much closer to a true rational positivism, exempt from both English empiricism and German mysticism." The English, "despite their real advantages," were, he believed, "less prepared today for such a solution [that is, less open to the new scientific spirit] than any other branch of the great Western family except Spain."[33]

But when Comte said France, what he really meant was Paris; and for that reason he called in 1832 for the Collège de France to establish a chair in the general history of the physical sciences and mathematics. Was it not essential, he wrote to François Guizot, the leading conservative politician of his day, to counter the narrow-mindedness and pinched taste of the great specialized technical institutions, especially the Ecole Polytechnique? "In this state of our intelligence," he continued, "human science in its positive aspect can be seen as one, and so therefore can its history." In 1846 Comte expanded his proposal to encompass a chair "in the general history of the positive sciences." No science, he believed, "can be known in a fully rational way unless one traces the historical filiation of its principal advances. Only this filiation can make unquestionably clear the ineluctable links with what precedes and what follows it in the natural course of our mental evolution." (Guizot, by the way, did not act on the proposal. He described Comte, whom he had met in 1833, as "a simple, honest man, deeply convinced, devoted to his ideas, modest in appearance although basically deeply proud, who sincerely believed that he had been called to inaugurate a new era in the history of the human spirit and human society." In 1848 Littré revived Comte's proposal, once again without success, and it was not until 1892 that Pierre Laffitte, "Comte's successor in positivist orthodoxy," was appointed to the Collège de France to teach this science. Wyrouboff, Littré's former colleague, succeeded him shortly thereafter.)[34]

PARIS, WORLD CAPITAL OF SCIENCE, incarnation of the Promethean myth of the constructed unity of the sciences in the service of man: it was a state of mind that lasted only briefly, from about 1800 to the 1840s. The end was sudden, and rather paradoxical, since the decline in the capital's scientific achievements after 1850 came at a time when the prestige of science and of individual scientists was still on the rise in Paris and when the benefits of science, or at any rate the benefits that public opinion associated with the growth of scientific knowledge, contributed to this rise.

For science, however theoretically conceived by its leading practitioners, did improve the standard of living in nineteenth-century Paris. The best symbols of that improvement were, surely, gas and electric light: the City of Light had not always been well lit, but by the time of the Revolution the idea that it might be had become at least plausible. Streetlights were introduced in 1745 and *falots,* or lanterns, began to be carried about the streets at night by roving lantern-holders. In 1797 Philippe Lebon started his investigation of gas lighting, whose practicality the English had demonstrated. After he was murdered in a nighttime assault, his widow demonstrated his "thermolamp" in 1811 in an installation on the rue de Bercy as well as in the Galerie Montesquieu of the Palais Royal. Later came the first experiments with electric lighting: arc lights were used to light the Place de la Concorde in December 1840. Then, in 1889, the first residential consumer of electricity (at 18, rue du Pont-Neuf) was hooked up to a generator at Les Halles, and the first electrically lit advertisement appeared in 1912.[35]

But in the end all this activity, abstract or practical, was of no avail: though both discoveries and scientific applications became ever more numerous in the life of the capital, the earlier emphasis on the centrality of Paris and the unity of scientific thought could not be sustained. In a general way, the decline of scientific Paris in the second half of the nineteenth century can be described in terms of a reversal of the same factors that led to its rise in the first part of the century.

Consider, first, the most complex of these, the structure of scientific knowledge itself. In 1830 it was still reasonable to think abstractly about science as a whole: Auguste Comte, as we have seen,

prided himself on following the development of all the sciences of his time. Berthelot was far more modest in 1901, however: "It has become almost impossible for one man to follow the advance and progress of even a single science such as chemistry in its entirety. I am one of the last—I believe the last—who can say that he possesses an idea of the full extent of chemical science, and I can do so only because I arrived at a time when it was still possible to take in all the elements of the subject. From now on, this will not be feasible."[36] Laplace (1749–1827) had been the unchallenged master of the kingdom of Parisian science. Even before the end of the Restoration, Cuvier (1769–1832) had been unable to assume that role.

And just as the idea of the unity of science waned, so did the "apparatus" of Parisian science go into decline. By 1860 everyone in the capital was aware that France was not investing enough in science. Only five days after the end of the Franco-Prussian War, the Académie des Sciences met on March 6, 1871, so that its members, one by one, could denounce the ruinous state of science in France. Pasteur met with enormous difficulties when he tried to raise funds to create the institute that bears his name. When Pierre and Marie Curie began their research on radium, they had to pay out of their own pockets for the many tons of pitchblende that their experiments required.

Compounding the lack of funds was a lack of energy, illustrated by the decline of the Muséum d'Histoire Naturelle. Cuvier's conservatism injured the institution's prestige, and in 1886 the chemist Chevreul was still teaching there at the age of 100. In 1873 Maxime du Camp wrote that the Prussians had bombarded the Muséum in 1870 so that it "would no longer just vegetate but die."[37]

Parisian indifference to work done in other countries was also a problem. Darwin's ideas, which Littré claimed had been anticipated by "Lamarck, without any change to their essential features by Darwin," were only slowly assimilated in Paris because they were "too English."[38] Few scientists followed the Polish-born Marie Curie in her efforts to assemble an international team of collaborators.

In short, Parisian science, though republican in principle, became in the second half of the nineteenth century nationalist, masculinist, dependent on patronage, and often unoriginal. Pasteur advertised himself,

and was accepted, as a solitary genius. Few people knew at the time, and many still do not know today, that he did his best to conceal the contributions of some of the young colleagues who worked with him in developing an anthrax vaccine.

By 1850 scientific initiative had passed from Paris to Germany, where Justus Liebig (1803–1873), a chemist trained by Gay-Lussac and Humboldt, led the establishment of new research institutes in the universities (an example that Dumas would have liked to follow at the Ecole Polytechnique). England and the United States then also set up laboratories that had no equivalent in Paris—which, when Marie Curie arrived, had only one chair in theoretical physics and no laboratory comparable to the one that Henry Cavendish had established in 1870 at Cambridge specifically to compete with Germany's new institutions.

Thus Paris, which had been the uncontested world capital of science in 1820 and 1840, no longer held that title by 1900, although at the end of the nineteenth century the city did find a new scientific mission that still gives us food for thought today. As Anne Rasmussen has eloquently demonstrated, the distinctive contribution of fin-de-siècle Paris was to serve as a setting for a new mode of scientific sociability: "Virtually unheard of before 1850, the 'international congress' form crossed a quantitative threshold after 1875 when it was extended to a great variety of disciplines, and its growth from then until 1914 was exponential." To cite just one of many possible examples, a Congress of Physics was held in Paris in 1900, bringing physicists from around the world together for the first time in an "international physics community." (In 1900, 87 percent of "world congresses" were held in Paris.) The Curies, Antoine-Henri Becquerel, Jean Perrin, and Paul Langevin participated, of course, but so did Max Planck, Ernst Mach, J. J. Thomson, William Thomson, and Alexander Graham Bell. In the laboratory the scientist worked alone, but at congresses, as Rasmussen notes, "the priority of oral communication tended to re-create . . . the old rituals of the Republic of Letters, which celebrated the majesty of science."[39]

Myth and fantasy: the categories can be applied to the history of sci-

ence in Paris as well as to the history of politics and literature. But the evolution of scientific research toward greater international collaboration at the end of the nineteenth century may also be taken as a harbinger of a new direction, one that Paris might follow today. For if the French capital can no longer hope to be the world capital of science that it was from 1800 to 1840, it can still, as the most European of the world's great international cities, be a meeting ground, a place for exchange and discussion, a site of noble, cosmopolitan, and continuing exchange.

7

Reading the Parisian Myths

MYTH PROVIDES STRUCTURE to the quotidian, helps us make sense of our everyday lives. To do this, however, it requires a material incarnation. Take, for instance, the anointing of the French king. Originally this was a ceremony (performed in the cathedral at Rheims) that turned the king into a religious personage and a miracle worker—a creature of myth. It established a bridge from the present to the past and the future, and it bound the king's subjects to God. But this mystical statement had to be given material substance as well, and it was Versailles that became royalty's magical envelope, giving tangible embodiment to the myth of the absolute Christian monarch. Without the ritual coronation at Rheims there could have been no divine-right monarchy, but without the unrivaled material prestige of Versailles the politico-religious myth of the French kings would not have prospered as it did.

In this same register, during the nineteenth century the myth of Paris (as capital of La Grande Nation or as world capital of modernity) was made monumentally "real" in a manner that still makes sense to us today. One can live in Paris without reading Baudelaire or looking at Manet's paintings or attending lectures at the Collège de France. But it is difficult to live in the city without constantly looking at, and "reading," such historicized symbols as the basilica of Sacré Coeur, an emblem of Catholicity; or the Eiffel Tower, an audacious symbol of modernity; or the Montparnasse Tower, a symbol of something that with luck may never come to pass, namely Chicago-sur-Seine.

27. Léon Daudet, *Paris vécu* (Paris: Gallimard, 1929), vol. 1, 133.
28. Benjamin, *Paris: Capitale,* 314.

5. NEGATIVE MYTHS OF LA PARISIENNE

1. Bronislaw Geremek, *The Margins of Society in Late Medieval Paris* (Cambridge: Cambridge University Press, 1987), 219.
2. Erica-Marie Benabou, *La Prostitution et la police des moeurs au XVIIIe siècle* (Paris: Perrin, 1987), 407, 391, 235.
3. Mercier cited by Marcel Reinhard in *Nouvelle histoire de Paris: La Révolution 1789–99* (Paris: Hachette, 1971), 95.
4. Fougeret de Montbron cited by Benabou in *La Prostitution,* 466.
5. Benabou, *La Prostitution,* 498.
6. Ibid., 457.
7. Ibid., 459.
8. The Goncourt brothers, May 3, 1863: "What a difference between this Haussmannian promenade and the Palais Royal that their mothers used to frequent." *Journal,* vol. 1 (Paris: Laffont, 1956), 962.
9. Pierre Citron, *La Poésie de Paris dans la littérature française de Rousseau à Baudelaire* (Paris: Minuit, 1961), vol. 1, 380.
10. Theodore Zeldin, *France, 1848–1945* (Oxford: Clarendon, 1973–1977), vol. 1, 308. According to Zeldin, in Paris between 1871 and 1903 at least 900,000 women practiced prostitution at one time or another.
11. Hugo cited by Citron in *La Poésie,* vol. 2, 11.
12. Chevalier cited ibid.
13. Louis Chevalier, *Les Parisiens* (Paris: Hachette, 1967), 12.
14. Valéry cited by Georges Bataille in *Manet* (Geneva: SKIRA, 1983), 62.
15. The Goncourts cited by Christopher Prendergast in *Paris and the Nineteenth Century* (Cambridge, Mass.: Blackwell, 1992), 144.
16. See Charles Bernheimer, *Figures of Ill Repute: Representing Prostitution in Nineteenth-Century France* (Cambridge, Mass.: Harvard University Press, 1989), 134.
17. Benabou, *La Prostitution,* 505.
18. See, e.g., Goncourts, Sept. 2, 1882, *Journal,* vol. 2 (Paris: Laffont, 1989), 953.
19. Corbin, *Les Filles de noces: Misère sexuelle et prostitution* (Paris: Aubier, 1978), 13.
20. Parent-Duchâtelet, *De la prostitution dans la ville de Paris,* cited by Bernheimer in *Figures of Ill Repute,* 17.
21. Alexandra Richie, *Faust's Metropolis* (New York: Carroll and Graf, 1998), 599.
22. Parent-Duchâtelet cited by Corbin in *Les Filles de noces,* 16.
23. Flaubert, *L'Education sentimentale* (Paris: Garnier, 1961), 160.
24. Daniel Halévy, *Pays parisiens* (Paris: Grasset, 1932), 164–165.
25. This passage draws on the work of Daniel Sussner, "Methexis: The Politics of Female Allegory and the 1871 Paris Commune" (undergraduate thesis, Harvard University, 2000).

26. Alexandre Parent-Duchâtelet, *La Prostitution à Paris au XIXe siècle,* ed. Alain Corbin (Paris: Seuil, 1981), 113.
27. Sketches which according to the Surrealist photographer Brassai, who made notes on the "secrets of Paris," were probably made at 14, rue de Provence, not far from the grand boulevards and their art dealers.
28. Albert Boime, *Art and the French Commune: Imagining Paris after War and Revolution* (Princeton: Princeton University Press, 1995), 65.
29. Chevalier, *Les Parisiens,* 10. Jean Favier, *Paris: 2000 ans d'histoire* (Paris: Fayard, 1997), 545.
30. Fanny Trollope, *Paris and the Parisians* (New York: Hippocrene, 1985), 269.
31. Favier, *Paris,* 33. Goncourts, Oct. 21, 1878, *Journal,* vol. 2, 801.
32. Jules Vallès, *Le Tableau de Paris,* ed. Marie-Claude Bancquart (Paris: Messidor, 1989), 398.
33. "Paris la vie," in *Paris guide, 1867, par les principaux écrivains et artistes de la France* (Paris: Librairie internationale, 1867), 1242.
34. Pierre de Nouvion and Emile Liez, *Un Ministre des modes sous Louis XVI: Mademoiselle Bertin, marchande de modes de la reine 1747–1813* (Paris: H. Leclerc, 1911). Du Camp, *Paris,* cited by Walter Benjamin in *Paris: Capitale du XIXe siècle* (Paris: Cerf, 1993), 92.
35. Victor Fournel, *Ce qu'on voit dans les rues de Paris* (Paris: Delahays, 1858), 405. Benjamin, *Paris: Capitale,* 157.
36. Emmeline Raymond, "La Mode et la parisienne," *Paris guide,* 923.
37. Théophile Gautier, *Paris et les parisiens* (Paris: Boîte à Documents, 1996), 643. Goncourts, Sept. 27, 1883, *Journal,* vol. 2, 1023.
38. Bernhardt cited by Valerie Steele in *Paris Fashion: A Cultural History* (Oxford: Oxford University Press, 1988), 154. On Duse see G. Pontiero, *Eleonora Duse in Life and Art* (Frankfurt: Peter Lang, 1986), 201.
39. Balzac, *Traité de la vie élégante* (1830), cited by Steele in *Paris Fashion,* 59. Baudelaire cited by Benjamin in *Paris: Capitale,* 299.
40. Benjamin, *Paris: Capitale,* 104.
41. Rifâ'a al-Tahtâwi, *L'Or de Paris: Relation de voyage 1826–1831,* trans. Anouar Louca (Paris: Sindbad, 1988), 119. Benjamin, *Paris: Capitale,* 105.
42. Raymond, "La Mode et la parisienne," 923, 926.
43. Fazil-Bey, *Le Livre des femmes,* trans. J. A. Decourdemanche (Paris: Leroux, 1879), 111.
44. Roger Caillois, *Le Mythe et l'homme* (Paris: Gallimard, 1938), 59.

6. CAPITAL OF SCIENCE

1. Michel Serres, "Paris 1800," in *Eléments d'histoire des sciences* (Paris: Bordas, 1997), 343.
2. Ibid., 339.
3. Parliamentary Archives, LXXIX (Paris, 1911), 453.

4. Bertrand Lemoine, *La Tour de Monsieur Eiffel* (Paris: Gallimard, 1997), 68, 102.
5. Emile Littré, *La Science au point de vue philosophique* (1873; Paris: Fayard, 1997), 528.
6. Perrin cited by Pascal Ory in "Une Cathédrale pour les temps nouveaux?" in Régine Robin, ed., *Masses et culture de masse dans les années trente* (Paris: Editions ouvrières, 1991), 183, 184, 201. Paul Vaillant-Couturier, during the same epoch, celebrated "the union of science and work."
7. Ibid., 193–194, 182.
8. See Louis Bergeron, *France under Napoleon* (Princeton: Princeton University Press, 1981), 199.
9. Louis Veuillot, *Les Odeurs de Paris* (Paris: Crès, n.d.), 295.
10. According to the eulogy by Aristide Briand after Berthelot's induction into the Pantheon in March 1907.
11. Yves Laissus, "Les Cabinets d'histoire naturelle," in René Taton, ed., *Enseignement et diffusions des sciences en France au XVIIIe siècle* (Paris: Hermann, 1964), 665.
12. H. Guenot cited by Dominique Poulot in "La Naissance du Musée," in Philippe Bordes and Régis Michel, eds., *Aux armes et aux arts* (Paris: Biro, 1988), 205.
13. Veuillot, *Odeurs,* 294. Marcel Chaigneau, *Jean-Baptiste Dumas: Sa vie, son oeuvre, 1800–1884* (Paris: Guy le Prat, 1984), 50–51.
14. Salle cited by Chaigneau in *Jean-Baptiste Dumas,* 61.
15. See Alice Stroup, *Royal Funding of the Parisian Académie Royale des Sciences during the 1690s* (Philadelphia: American Philosophical Society, 1987).
16. Mercier cited by Nicole and Jean Dhombres in *Naissance d'un pouvoir: Sciences et savants en France, 1793–1824* (Paris: Payot, 1989), 13.
17. Racine, "Discours prononcé à la réception de M. l'abbé Colbert," in *Oeuvres complètes* (Paris: Pléiade, 1966), vol. 2, 344.
18. Robert Fox, *The Culture of Science in France, 1700–1900* (Aldershot: Variorum, 1992), 447.
19. Alain Mercier, *Un Conservatoire pour les arts et métiers* (Paris: Gallimard, 1994), 39–40.
20. Fox, *Culture of Science,* 446. The Athénée, which survived until 1849, was equally revivified: Fourcroy, Chaptal, Monge, Vauquelin, Cuvier, Biot, Ampère, Say, Fresnel, and Geoffroy Saint-Hilaire taught there.
21. Cited by Dhombres in *Naissance d'un pouvoir,* 218.
22. Stendhal, *Promenades dans Rome* (Paris: Pléiade, 1973), 899–900.
23. Claude Schnitter, "Le Développement du Muséum national d'histoire naturelle de Paris au cours de la seconde moitié du XIXe siècle: 'Se transformer ou périr,'" *Revue d'histoire des sciences,* 49, no. 1 (1996), 54.
24. Dumas cited by Chaigneau in *Jean-Baptiste Dumas,* 52. Pierre Citron, *La Poésie de Paris dans la littérature française de Rousseau à Baudelaire* (Paris: Minuit, 1961), vol. 1, 65–66. Goethe, *Conversations avec Eckermann* (Paris, 1863), cited by Christophe Charle in *Paris fin de siècle* (Paris: Seuil, 1998), 22.

25. Annie Petit, "L'Esprit de la science anglaise et les Français au XIXème siècle," *British Journal for the History of Science* 17 (1984), 277.
26. Dhombres, *Naissance d'un pouvoir,* 217.
27. Laplace cited ibid., 216.
28. Anne Alter and Philippe Testard-Vaillant, *Guide du Paris savant* (Paris: Belin, 1997), 601. They also note that "the number of theorems discovered per resident is the highest in the world." Fontenelle cited by G. Canguilhem in "Physiologie," *Encyclopedia Universalis* (Paris, 1990–1993), 245.
29. Serres, "Paris 1800," 347.
30. Mercier, *Tableau de Paris,* ed. Jean-Claude Bonnet (Paris: Mercure, 1994), 330. Humboldt and Candolle cited by Chaigneau in *Jean-Baptiste Dumas,* 51, 52–53.
31. See J. V. Pickstone, "Locating Dutrochet," *British Journal of the History of Science* 11, no. 37 (1978), 53.
32. Sénebier cited by Canguilhem in "Physiologie," 244.
33. Comte, *Cours de philosophie,* 57th lesson, cited by Petit in "L'Esprit de la science anglaise," 279. Renan shared this suspicion of English science: "I don't know of a single English person—Byron perhaps is an exception—who has profoundly understood the philosophy of things." Ibid., 282.
34. Annie Petit, "L'Héritage du positivisme," *Revue d'histoire des sciences* 48, no. 4 (1995), 521–556, 530, 521.
35. Alter and Testard-Vaillant, *Guide du Paris savant,* 251.
36. Berthelot cited by Anne Rasmussen in "A la recherche d'une langue scientifique internationale, 1880–1914," in Roger Chartier and Pietro Corsi, eds., *Sciences et langues en Europe* (Paris: CNRS, 1996), 144.
37. Du Camp cited by Schnitter in "Le Développement," 86.
38. Petit, "L'Esprit de la science anglaise," 287.
39. Anne Rasmussen, "Science et sociabilité: Un 'tout petit monde' au tournant du siècle," *Bulletin de la société d'histoire moderne et contemporaine* 3–4 (1997), 49–50, 51n7, 77, 53.

7. READING THE PARISIAN MYTHS

1. Maxime Du Camp, *Paris: Ses organes, ses fonctions, et sa vie* (Paris: Hachette, 1873), vol. 1, 6.
2. Tabarant, *La Vie artistique au temps de Baudelaire,* cited by Andrée Sfeir-Semler in *Die Maler am Pariser Salon, 1791–1880* (Frankfurt: Campus Verlag, 1992), 49.
3. Baudelaire, *Le Peintre de la vie moderne,* in *Oeuvres* (Paris: Pléiade, 1961), 1173–74.
4. Pierre Nora, ed., *Les Lieux de mémoire,* vol. 1: *La République* (Paris: Gallimard, 1984), xix.
5. René Héron de Villefosse, *Bourgeois de Paris* (Paris: Bernard Grasset, 1941), 185.
6. Paul Metzner, *The Crescendo of the Virtuoso* (Berkeley: University of California Press, 1998).
7. Balzac, *Père Goriot* (Paris: Pléiade, 1951), 947.