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had hardly any control, played a crucial role in the eruption of this violence.

An impressive bibliography that covers 77 pages attests to a remarkable research effort and a thorough knowledge of the literature on urban issues. Furthermore, a very original idea in its conception and a very meticulous tale of three cities, *Second Metropolis* raises and answers some of the fundamental questions about urbanism at the turn of the last century.

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Dierig, Sven, Jens Lachmund, J. Andrew Mendelsohn, eds. *Science and the City*. OSIRIS 18. 2003. Pp. v, 282. Illustrations, index.

When I was a boy on a farm between New York and Philadelphia, a trip to the city was an event. Inevitably the trips centred on museums. The museums displayed objects in grand settings: knights in armour at the Metropolitan Museum of Art, Picasso and Dali at the Museum of Modern Art, classical and pre-classical antiquity at the University of Pennsylvania Museum, dinosaur bones and dioramas in the American Museum of Natural History, and all manner of mechanical gadget at the Franklin Institute. Art and science, ancients and moderns, all occupied adjacent spaces in my head. It was Civilization, while scratching out a living on a farm was Nature. But city streets and structures were forbidding and the air was foul. I was glad to return to the soil and breeze, and tumble into bed listening to sounds from the nearby forest. Whatever else may be said about cities over the past several millennia, they are places of *Kultur*; the surrounding countryside of plains and mountains, woods and waters, define *Natur*.

Civilization, a word invented in the Enlightenment, is based in cities, and it finds its antithesis in the Arcadia of Romanticism. The citizens of Paris, makers of a revolution based on reason, arrayed themselves against rustics in the countryside. Mary Wollstonecraft Shelley contrasted the teeming cities of Europe, in *The Last Man*, with the sparsely settled Alps and the frozen Arctic of *Frankenstein*. Like City Mouse and Country Mouse, 19th-century writers circulated between the culture of the city and the nature of the wild, perhaps captured most emblematically in the mathematician and historian Thomas Carlyle's migration from Craigenputtoch in Scotland, where his wife Jane could hear the sheep graze, to London, where Thomas lined his study with cork in a vain attempt to insulate himself from urban noise.

Innovative thinkers seek the city. First, there are lots of clever people to talk to and rich people to associate with. There are distractions for the flesh and the spirit. Trades useful for the advancement of knowledge—printing, illustrating, manufacturing—are readily at hand. Need to look into the cause of disease? Cities have lots of corpses. Need a translator for that paper in

Hungarian? A city is the best place for finding one. There are reversions. By the 19th century, astronomers and oceanographers seek mountain-top skies and unpolluted harbours, just as, later, enormous installations for space exploration and particle physics come to pastoral settings. And Charles Darwin, Lord Rayleigh, and Charles Sanders Peirce pursued their subtle enquiries in bucolic tranquility. But by and large modern science is a bourgeois phenomenon.

For moderns, alabaster cities, brought into being by science, would shine "undimmed by human tears." Cities animate Gandhi's and Mao's hatred of European technology, just as they offended visionaries from William Morris to Fritz Lang. In its utopian or fictional representation, science has often been abstracted from the city. Bacon's New Atlantis was located on a remote island, as was Prospero's realm; so was Dr. Moreau's laboratory and the factory of Rossum's Universal Robots. Saint-Beuve's coining of the term *ivory-tower abstraction* (an acid indictment of Romantic poet Alfred de Vigny) became a byword for the lodging of pure science—the place known today (for better or worse) as a college campus. The cities, monocular monsters lacking depth-perception, consume culture and spit out the bones; it has always required ingenuity to succeed in them. This is the condition of Polyphemos's cave, which is a trigger for Odysseus's wile. Are scientists in the city like Odysseus, thrown into an extreme setting on their way back to Arcadia? How is knowledge determined by the city? Is there, that is to say, bourgeois science, in the pregnant phrase of Lenin?

The editors of *Science and the City* contend that cities, as a congeries of material culture, determine the shape of natural science. For them, salmagundi cities force diverse things to rub up against each other, and in this way generate new ways of understanding nature. In fact they seek to dissolve the distinction between coffee roasters and azo-dye chemists, between city-street directories and imperial cartographers, between stars of the opera and stars of the heavens, between clogged urban arteries and myocardial infarcts: "One thesis of this volume is that no essential boundary separates these mundane practices of knowledge creation from scientific knowledge creation . . . [These examples of t]raffic between urban and scientific knowledge practices suggest a continuum rather than an essential difference between them" (16–17).

The collection's 13 chapters divide into two sections, one on the 19th century, and one on the 20th century. With the exception of the finest contribution, by Fan Fa-ti, all the chapters deal with the North-Atlantic world. The 19th-century section features Fan Fa-ti's study of British naturalists in Canton early in the 19th century. Fan shows how much of mainland natural history became known to Europeans through autochthonous commercial suppliers, who—in the traditional manner of the export trade—provided or cultivated what the foreigners wanted. New specimens came not from primitive accumulation by Europeans on expedition but rather through a complex commercial network where Chinese had the upper hand. Also in this

section are Dora Weiner and Michael Sauter's recapitulation of the rise of the medical clinic in Paris, Denise Phillips's study of the Isis Society in Dresden, and Sven Dierig's study of Carl Ludwig and mechanical respiration in Leipzig. The intellectual magnet of Paris attracts the attention of four contributors: David Aubin, Theresa Levitt, and Antoine Picon consider mid-19th-century astronomers, physicists, and urban map-makers, and J. Andrew Mendelson examines microbiologists Alexandre Yersin and Emile Roux. The 20th-century section collects Karin Bijsterveld on noise pollution in the Netherlands, Hans Pol and Christian Topalov on urban sociology in America and Europe, Jens Lachmund on botanical field-work in war-devastated cities, and Rosemary Wakeman on utopian planning for technopolis in France.

Bijsterveld and Lachmund suggest how archives may be used in a new way, but all the chapters are based on models of biographical and institutional narrative dating from the early part of the 20th century; they succeed or fail by their use of the usual kinds of unpublished correspondence and secondary sources. The volume provides no trace of *annalier* or cliometric innovations. There is no appeal to a *longue durée*, no statistics, virtually no prosopography, and very little discussion about money. In the most persuasive chapters—Weiner and Sauter's summary of the Paris clinic, Levitt's discussion of the Biot-Arago controversy over the polarimeter, and Wakeman's analysis of planning in the Fourth and Fifth French Republics—the city as such shapes scientific ideas not at all. It is like the ether—imponderable, everywhere present, and irrelevant for both theoretical invention and experimental design. There are missed opportunities. In her study of Dresden science, for example, Phillips omits reference to art, the city's cultural jewel. Mendelsohn contends that Yersin's microbiological style was a kind of urban fieldwork (notwithstanding Yersin's fascination with exotic travel and his many years in Indochina!): "The Impressionists' art and Yersin's microbiology are understandable as parallel expressions of the same, transformed urban physical and human geography" (154). But no evidence is supplied of theories or disease metaphors or figures of speech deriving from Yersin's youthful fascination with the City of Lights.

Sven Dierig provides an illuminating account of Carl Ludwig's invention of a mechanical lung, his urban laboratory "the place where the first living organism that was part machine and part animal was created and brought into use for scientific purposes" (128). Dierig emphasizes Ludwig's inspiration in industrial factories. Surely it is reasonable, however, to see the instruments of late 19th-century physiology as a derivation from physics and the enormous prestige of the physician-turned-physicist Hermann von Helmholtz, who as director of Berlin's Physikalisch-technische Reichsanstalt supervised physical and electrical standards for the German empire. Dierig concludes, "When clockworks, hand cranks, and foot pedals were replaced by the iron laboratory worker, the urban laboratory revolution became an industrial revolution in situ" (134). This is produc-

tion-line science, like Justus von Liebig's laboratory in organic chemistry set up a generation earlier, which led into (rather than derived from) industrialization. We never learn why the city was necessary for Ludwig's work. It was not necessary for the physicists in Königsberg who founded their discipline, earlier in the century *before Germany industrialized*, on exacting measurement of nature's constants.

To readers with a long view of history, the rhetoric in this volume will call to mind previous disjunctures between faith and evidence: religious invocations preceding medieval Islamic treatises in astronomy; the insertion of the Deity into 17th-century natural philosophy; myriad 19th-century books about the proofs of Christianity in the natural world; weighty tomes on science and proletarian history appearing in the 1980s in East Germany and Romania; and equally weighty volumes on creationist science appearing around the world today. *Science and the City* radiates more heat than light. Here smoulder the embers of postmodernist caprice.

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Almandoz, Arturo, ed. *Planning Latin America's Capital Cities, 1850–1950*. London and New York: Routledge, 2002. Pp. xii, 282. Illustrations, maps, index. \$120 (hardcover).

"Paris goes West," "a mirror image of a European metropolis," "America's most European city," and "the Paris of the Hispanic American Republics." Such descriptions of Latin American cities in the century between 1850 and 1950, taken from numerous chapters in the present book, help reveal the extent of Europe's ascendance in the transfer of urban ideals and models to that region, the central theme of those contributing to this volume.

Given that this process of "Europeanization" (as it is referred to by the editor) varied, the book is organized into three broad sections, with the first treating the capitals of the booming 19th-century economies, Buenos Aires, Santiago, Rio de Janeiro, and São Paulo; the second dealing with Mexico City and Lima, early viceregal capitals that suffered decline after independence; and the third focusing on capital cities in the Caribbean rim and Central America, specifically Havana, Caracas, and San José, cities that have seldom been described as sharing in this process. Within this broad time frame, three phases of Latin America's dependence, characterized by correspondingly distinct urban planning models, are further identified: (1) the second half of the 19th century, during which time the increase of European capital led to the selective adaptation of Haussmann's ideas in many parts of the region; (2) the *belle époque* from the late 19th century until well after the First World War, which was associated with sanitary reforms, urban renewal, and residential expansion; and (3) the period after 1930,