A Review of "The New Science of Cities"

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As an example, Moretti charts the divergence of Seattle and Albuquerque since the late 1970s, when Seattle was dreary and the "city of despair" (p. 76). In hindsight, a pivotal point in the city's industrial history came when Bill Gates and Paul Allen decided to move their fledgling company—Microsoft—back to where they grew up, with the company's success in no small part responsible for seeding a much larger technology ecosystem (p. 77). It is noteworthy that the decision was decidedly not a business decision, and thus outside of the typical analytical purview of location theory. Yet, this one event arguably had a strong halo effect, changed the economic landscape, and ultimately meant that Jeff Bezos would consider Seattle for Amazon. Moretti estimates that Microsoft, by way of economic multipliers, has been responsible for the creation of 200,000 (non-Microsoft) jobs in the region, 60% of which are in services. Moretti estimates the economic multiplier of such innovation jobs to be as high as five new jobs, largely service, for each new innovation job added. As such, he says, innovation is the new prosperity engine, providing largely outsourcing-safe jobs.

Importantly, because of such vast agglomeration-based multipliers, high school graduates in metropolitan areas with large shares of college graduates make more money than college graduates in areas where they have few peers. Put another way, Moretti concludes that your salary depends more on where you live than your résumé (p. 88).

In a lively chapter titled "Poverty Traps and Sexy Cities," Moretti asks whether policymakers can help cities like Flint (MI) reboot its economy by, among other things, implementing Richard Florida's (2012) "creative class" concepts. Moretti criticizes this approach as a fundamental confusion of causality: Many successful cities have all the hallmarks of creativity, such as active cafés, nightlife, galleries, and the like, but these are the result of creative classes, not the cause of their appearance. Berlin (Germany) is mentioned as a quintessential creative class, yet poor, city. Moretti notes that if it is difficult for a city like Berlin, with all its assets, to establish a new economy based on the creative class idea, things look that much more dire for the American Rust Belt.

Overall, *The New Geography of Jobs* is a compelling read, offering a solid map of an important and increasing economic division in American society. While Moretti offers little in the way of tools to address the Great Divergence, this is a testament to the difficult nature of the problem. Quick fixes are not found for generational problems, although the author does leave us with a strong call for more sensible immigration and education policies

Reference

Florida, R. (2012). *The rise of the creative class*. New York, NY: Basic Books.

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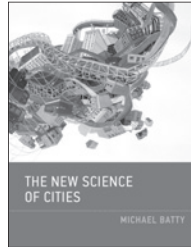
Reviewed by Michael B. Teitz, *University of California, Berkeley*

Is there a science of cities? If there is, no one has done more to bring it about than Michael Batty, who has been its foremost exponent for the past four decades. In this magisterial book, he brings together and synthesizes the work that he and other scholars in London and around the world have done to investigate this question. It is an impressive achievement that makes a strong case for a science of cities, built around a particular perspective. For Batty, science requires a rigorous foundation. His approach does not rest on the detailed historical richness and complexity of cities that fascinates so many scholars and planners, nor is it grounded in other disciplines such as economics or sociology. As a geographer with strong links to planning, he is drawn to spatial structure, and his perspective is empirical and positive. Thus, his starting point is an austere view of phenomena central to the existence of cities, namely flows and networks. Yet, from this austerity emerges great richness and insight.

The book comprises three main parts. The first three chapters lay out Batty's view of the foundations of an urban science, providing a basis for much that follows. The next six chapters are the heart of the book, showing how these foundations can provide rich insight into urban phenomena in the context of systems and complexity theory. Much that is reported here builds on his earlier work, synthesizing it in new and interesting ways. The third section seeks to connect to planning, exploring the difficult question of a science of design.

For readers who might be discouraged by the algebra that comes later, some of which is not quite as simple as Batty might hope, the first chapter, "Building a Science of Cities," provides a brilliant overview of his thinking and of its relation to complexity theory. He argues "…cities must now be looked at as constellations of interactions, communications, flows, and networks, rather than as locations…" (p. 13). Thus, location "…is, in effect, a synthesis of interactions…" (p. 13). Building a set of tools to handle flows and networks is the task of the next two chapters. For flows, in Chapter 2, Batty begins with the gravity model that still underlies much of transportation and migration analysis. Building from simple ideas, and using both historic and innovative visualizations, he constructs generalizations of the model, exploring symmetric and asymmetric flows. The third chapter switches its focus to networks, the structures that enable flows to occur. To do this, he uses graph theoretic ideas, representing flows as simple or bipartite planar graphs to reveal network structure. The richness of this approach is shown in examples of street networks and illustrations that generalize and demonstrate variations on the basic ideas.

The six chapters of Part II cover a huge spectrum of ideas and applications. Chapter 4 takes the hoary idea of the rank-size rule to places undreamed of by its originators, showing how it can be used

to explore the dynamics of growth of cities and of systems of cities. A particularly striking feature of this analysis is the "rank clock," which Batty uses to show the pattern of dynamic behavior for a range of city distributions as well as for other examples, such as Fortune 500 firms and tall buildings. Chapter 5 takes up the question of urban hierarchies and their dynamics of growth using models that simulate growth governed by relatively simple rules, primarily scaling, and extending them spatially. With this, Batty takes us into the realm of diffusion on lattices, using models to reveal and explore hierarchies. Examples from London show how population density and the London Tube system both exhibit hierarchical relations.

Urban structures as space syntax and network morphology are addressed in Chapters 6 and 7. Here, Batty inverts the conventional view of a street network as a planar graph in two-dimensional space to a space syntax representation that focuses on streets rather than junctions, and in which distances are no longer Euclidian. He then constructs a framework that unifies the two by treating a street system as a bipartite graph. From this structure, he constructs alternate accessibilities based on connectivity and distance, and illustrates them with an example. Chapter 7 extends this analysis to complex networks with a particularly interesting example in central Melbourne's underground rail loop.

From space syntax, Chapters 8 and 9 turn to urban growth and form, focusing on fractals and urban simulation, respectively. Here, Batty draws on much of his own path-breaking work, showing how fractals can be used to model space-filling processes, and how cellular automata can generate realistic urban patterns. Following this, he sets out a generic location model, complementing it with discussions of visualization and scenarios. This is a rich and diverse discussion, as befits a rapidly evolving field.

In the final section, Batty turns to design, an even more formidable analytic problem than those preceding it. He views design as "…embedded in networks of those who have a stake in a problem, and the process of generating new designs as one of communicating and resolving conflicts between different views of the future" (p. 302). This is a plannerly view of the design problem, which he addresses with analytical tools.

The final chapters extend the design problem into an even broader realm, namely collective action. Building on James Coleman's work on collective action, originally done in the 1960s, Batty sets up the problem of interacting actors with diverse interests in a matrix formulation that enables analysis of the interactions between problems, actors, and policies. This is followed by an examination of urban land development as a process of exchange, again based on Coleman's work. In these chapters, Batty goes beyond the usual conceptions of urban science in his venture into modeling collective action. It is no accident that much of the work he cites dates from the 1970s or earlier: There simply has not been much advance on this front since that time. In taking it up, he has challenged those who still believe that such a program is possible, as well as those who would reject it.

In sum, Michael Batty has written a definitive and important book. After three decades of attacks on quantitative analysis in planning, even as quantitative tools such as GIS and statistical analysis have become virtually universal, he demonstrates the power of an analytic approach to the study of cities. Urban science is here to stay.

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Political Economy of Cities
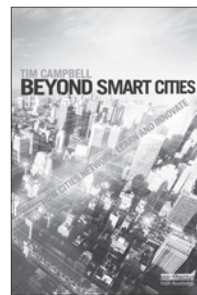
Tim Campbell. (2012). *Beyond Smart Cities: How Cities Network, Learn and Innovate.* New York, NY: Routledge. 256 pages. $51.95 (paperback).

Reviewed by Hugh Schwartz, *Economist and Consultant*

Tim Campbell has taught, consulted, and served with the World Bank. In *Beyond Smart Cities: How Cities Network, Learn and Innovate*, Campbell points to the importance of the processes of urban planning, whereby cities become actively engaged in learning. In *Beyond Smart Cities*, Campbell outlines how cities construct, convert, and manipulate relationships with other cities to foster learning and knowledge exchanges between cities. Here, he emphasizes the experiences of a handful of cities, but draws on data from a larger number of places.

Campbell starts from a point of view that characterizes learning as a collective process that begins with discoveries by individuals. In a chapter on "Cities as Organizational Learners," Campbell emphasizes the role that trust and collaboration must play in successful learning. He refers to the need to develop a "ba atmosphere," defined as one of openness, but with human relational elements that tie the pieces together. While an interesting concept, further explanation would be useful to more fully describe the attributes of this condition. Campbell goes on to categorize city learning into five types, but acknowledges that cities may move from one category to another. A key, he claims, is motivation and clear purpose. Also required is the creation of learning experiences that draw on stored memory, often largely in the form of information from other cities, to deal with emerging problems.

Campbell analyzes and summarizes findings from 53 cities, classifying them along dimensions of innovation, geographical patterns, and types of learning. For example, a chapter on informal learning emphasizes Turin (Italy) and Portland (OR). Turin exemplifies business transactions involving both public and private sectors, as well as the importance of network ties. In contrast, Portland's experience is driven by environmental concerns and a focus on land use. In the case of Portland, Campbell cites three learning mechanisms. First, organized exchange with outside sources of information provided guidance on challenges and opportunities for the city. Second, talent and new ideas were brought by young immigrants seeking the blend of urbanism and nature that the city had been creating. Third, a system of internal networks of trust formed by civic-minded persons yielded some of the innovations in placemaking, design, and the like that Portland is now known for.

Campbell's chapter on technical learning discusses Curitiba (Brazil). He emphasizes that city's responses to growth pressures, congestion, and deficiencies in infrastructure and services, stressing