G. C. Bowker, S. Timmermans, A. E. Clarke and E. Balka (eds.)
Boundary Obects and Beyond. Working with Leigh Star, Cambridge, MA, MIT Press, 2016, pp. 560
by Alessandro Narduzzo

J. Evans, A. Karvonen and R. Raven (eds.)
The Experimental City, London, Routledge, 2016, pp. 280
by Claudia Mendes and Pim Peters

J. Gabrys
Program Earth. Environmental Sensing Technology and the Making of a Computational Planet, Minneapolis, University of Minnesota Press, 2016, pp. 368
by Caspar Menkman

M. Krajewski, J. Meerhoff and S. Trüby (eds.)
Dienstbarkeitsarchitekturen. Zwischen Service-Korridor und Ambient Intelligence [Architectures of Subservience. Between Back-Corridors and Ambient Intelligence], Tübingen-Berlin, Wasmuth, 2017, pp. 462

A. Meier and E. Portmann (eds.)
Smart City. Strategie, Governance und Projekte [Smart City. Strategy, Governance and Projects], Wiesbaden, Springer Vieweg, 2016, pp. 346
by Susann Wagenknecht

G.F. Lanzara
Shifting Practices. Reflections on Technology, Practice, and Innovation, Cambridge, MIT Press, 2016, pp. 304
by Attila Bruni

B. Latour
Piccola filosofia dell'enunciazione (con una nota di Jacques Fontanille) [*Tiny Philosophy of Enunciation (with a note by Jacques Fontanille*)], Roma, Aracne, 2017, pp. 68
by Alvise Mattozzi

T. Moreira
Science, Technology and the Ageing Society, London and New York, Routledge, 2017, pp. 240
by Roberto Lusardi

T. Scholz and N. Schneider (eds.)
Ours to Hack and to Own. The Rise of Platform Cooperativism, a New Vision for the Future of Work and a Fairer Internet, New York and London, OR Books, 2016, pp. 252
by Giacomo Poderi

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Geoffrey C. Bowker, Stefan Timmermans, Adele E. Clarke and Ellen Balka (eds.)
Boundary Obects and Beyond. Working with Leigh Star, Cambridge, MA, MIT Press, 2016, pp. 560

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This book is the result of a conference that fellows, students and co-authors dedicated to the beloved scholar, Leigh Star, to celebrate her inspirational work. The book's editors avoided the favourable tone that is typical – and to some extent, involuntary – in such works, by putting together a balanced selection of essays *by* Star and *on* Star, which flows seamlessly and ultimately provides a rich and precise portrait of the scholar. The book ultimately covers not only her intellectual contributions to scientific knowledge, but also her mindful self-reflection on the role of researchers in society as part of an epistemological discourse. Altogether, the book provides a thick web of reflections displaying the potential of Star's intellectual contribution and suggesting possible directions in which to extend her work.

In fact, one major trait that characterises Star's legacy relates to her influential contributions across a wide spectrum of scientific domains. This is exemplified by her most cited publication, where Star and James R.

Griesemer introduced the concept of "boundary object" (addressed in Ch. 7). It is worth to get back to Star and Griesemer's definition. For them, a "boundary object" is an object that is "both plastic enough to adapt to local needs and constraints of the several parties employing [it], yet robust enough to maintain a common identity across sites". Therefore, a "boundary object" is "weakly structured in common use, and become strongly structured in individual-site use" (pp. 176-177). Because of these features a "boundary object" can have a different meaning in different social worlds, but its structure is common enough to make it recognisable, so that it can work as a means of translation.

It is worth noting that citations of Star and Griesemer's article appear in publications across more than 90 research areas. The top three areas in terms of the number of citations, based on the Web of Science classification, are Business Economics, Computer Science, History and Philosophy of Science; Sociology comes in at the sixth place. Such an influential presence across various distinct fields not only qualifies the relevance of Star's scientific contribution, but also suggests that her theorisation is a boundary object in itself, being plastic enough to be adopted as a tool for research investigations by various scientific communities, while preserving its own identity.

Dick Boland (Ch. 10) effectively explains why and how the concept of boundary objects was so influential in management and organisation studies. The concept demarcates concrete and situated things that actors with heterogeneous knowledge can use and refer to, while cooperating and working together, without setting or agreeing on the nature of the objects, actions or goals to be achieved. Further, this concept brings in a perspective that is entirely different from what was previous offered by semiotics, where symbols may be ascribed different meanings by different people but the spectrum of those meanings is constrained within a space of mutual understanding (i.e., individual expectations on everyone's meanings).

In a similar vein, Griesemer (Ch. 8) reflects on the ideas discussed by Star and himself at the time they were elaborating on the concept of boundary objects, from the perspective of Science and Technology Studies (STS). They wanted to develop a "heuristic methodological category to think with as much as an ontological category of object to think about" (p. 207). Thus, the concept of boundary objects has both epistemological and ontological consequences. In the former case, it provides STS with a methodological tool that increases standardisation across studies and, therefore, scientific rigor. As for the latter, the concept embodies the complexity of relationships among agents at multiple levels (e.g. meanings, action, goals) of interaction.

As anticipated, the concept of boundary objects became extremely popular in various fields, causing its core meaning to be undermined. Star (2010), in turn, was compelled to explain and elaborate on what a

boundary object is not. On the one hand, she expanded the concept by clarifying that boundary objects are not restricted to the four types mentioned in her 1989 work, namely, repositories, ideal types, coincident boundaries and standardised forms. On the other, she called for a deeper analysis of boundary objects to incorporate their organisational structure, as well as their intrinsic processual dimension, as connectors of cooperative work. The emphasis on the organisational structure of boundary objects led Star to reflect on systems constituting boundary objects that she identifies as infrastructures, a conceptualisation that also occupies a special place in Star's theorisations as well as in her epistemology. The centrality of this concept and its ramifications can also be observed in the writings selected for this book as the idea of infrastructure is relevant in a number of essays (i.e. Chs. 2, 7, 20, 21, 23, 24); this includes the seminal paper written with Karen Ruhleder (Ch. 20) on the design, development and use of WCS – the Worm Community System – which is a data repository as well as a platform to support the formal and informal communication of a distributed community of biologists, who are active in more than 100 different laboratories around the world. Through this study, Star and Ruhleder outlined their theory of infrastructure. Infrastructures are scaled-up systems of boundary objects, inheriting from the latter their relational and ecological nature: they "mean different things to different people" and are "part of the balance of action, tools and the built environment, inseparable from them" (p. 473). Infrastructures both anchor and are anchored to organised, context-dependent practices. Star characterises infrastructures in detail as embedded and transparent, but visible upon breakdown (i.e. infrastructural inversion); as able to support tasks and practices; as able to afford membership in a community of practice, which evolves in a mutual adjustment with infrastructures.

Star leverages the concept of infrastructure to develop some critical insights on the realm of the philosophy of science. In her view, science is conceived as a socially constructed ecology of knowledge (Ch. 1). Consistent with the STS approach, Star's analyses of science and technology includes the process – and not only the product – of the production of scientific knowledge to unveil what is otherwise taken for granted as scientific infrastructure.

"As chains of causation are simplified and purified, the standard indicators they are built on become substitute theories. We forfeit the infrastructural conditions that afford us the possibility of formulating alternative explanations" (p. 432). When the understanding of a phenomenon essentially relies on dominant chains of causal relationships, supported by infrastructures such as standard indicators and tools, this understanding expunges, as residual evidence, anomalies that would provide the grounds for richer insights into that phenomenon.

Furthermore, Star enhances her reasoning on infrastructures by offering thorough reflections on the methodological challenges posed by this

concept (Ch. 24). The study on WCS is the result of fieldwork spanning three years; despite a strict adherence to the principles of participatory design, the new system was disregarded by most biologists. This disappointing result led the research team to deepen their analysis of the situation and, ultimately, to better understand how critical and intensive the relational nature of infrastructure was.

This book can claim many merits. The selection of essays offers an excellent resource for scholars interested in understanding and tracing the origins of very influential concepts (i.e. boundary objects and infrastructures), the research questions that sparked them and how particular empirical settings influenced their formulation. This book will also be useful for researchers, such as PhD students, who are deliberating on the methodological aspects of their work. In fact, although the book is certainly not meant to be a handbook on methodology, it offers rich and rigorous reflections on fundamental methodological themes from the first-person perspective and deeply reflects the common emotional and cognitive identity of researchers.

On this point, a representative example is offered by the notion of "triangulation from the margins", as described by John King (Ch. 17). Triangulation is certainly a widespread practice in the social sciences to improve the understanding of complex phenomena. Star questioned the idea that this understanding could be achieved by primarily triangulating the narrative of those who have the most to gain or lose. In contrast, Star theorised the importance of triangulating using the narratives of those who exist in the margins: these individuals can observe elements, which are totally neglected by the dominant views, and therefore, they contribute to the enrichment of the triangulation through insights that would otherwise be lost.

As Leigh Star writes, "as a graduate student, I searched for years for teachers who would not try to divorce me from my life experience, feelings, and feminist commitments. At the same time, I didn't want just a 'touchy-feelings' sort of graduate education. […] I was looking for a way simultaneously to incorporate formal and informal understanding" (p. 122). For those who recognise themselves in such yearning, this book will certainly offer an opportunity to reflect on their own path.

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James Evans, Andrew Karvonen and Rob Raven (eds.)
The Experimental City, London, Routledge, 2016, pp. 280

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Evans, Karvonen and Raven's *The Experimental City* is a timely contribution to a growing body of literature on urban experiments – for other recent literature see (Castán Broto and Bulkeley 2013; Karvonen and van Heur 2014; Laurent and Tironi 2015). Yet, the current edited volume is distinctive in that it brings together contributions from a variety of disciplines such as transition studies, urban studies and STS. This combination is not always easy or without frictions, but provides the reader with a rich variety of conceptual sensibilities and insights. Urban experimentation on the one hand appears as holding a promise for realizing a more sustainable organization of urban life and overcoming resistance to change, on the other hand, it is also presented as ambivalent and highly political activity requiring careful examination and continuous critical engagement.

With a strong empirical focus, the volume takes the reader on a journey through case studies from regions as diverse as Ghana, Chile, Abu Dhabi, Korea and the UK, to name just a few, thereby showing the prevalence of urban experiments but also the diversity of phenomena taken into account. Some of the volumes stand out chapters for an STS audience include a critical analysis of "cabin ecologies" developed to protect humans in hostile environments (such as space) and a their links to currently emerging "integrated urban infrastructures" such as the Apple campus in Cupertino (Marvin and Hodson), an interrogation of the limits to experimentation when it becomes incorporated as marketable differentiator by the property development industry (Rapoport), a critical analysis of the planning, assembling and inhabitation of experiments in "green living" in Santiago de Chile (Sanzana Calvet and Castán Broto), an ethnographic account tracing the modernist vision of a resettlement experiment and its afterlife in local discourse and imaginaries in rural Ghana (Yarrow) and the speculative but thought-provoking sketch of a potential post-carbon city (Pincetl).

The presented case studies range from bottom-up to top-down initiatives, highly controlled environments to *in vivo* settings, projects branded as experimental and practices spontaneously emerging as such, thereby showcasing different conceptual and empirical enactments of the main issue at stake: the experiment and its relationship to the city. A recurring feature throughout the volume however, is an understanding of the experiment as an arrangement for exploring working relations in order to "prompt genuine change" (p. 1) – to put it in the words of the volume editors – towards more sustainable ways of organizing collective urban life. This is a clear departure from the "classical" understanding of the

Chicago School, which, as argued by Gieryn (2006) understood the urban laboratory as a "restricting and controlling environment, whose placelessness enables generalizations to 'anywhere'" (Gieryn 2006, p. 7). By contrast, most contributors to the current volume do not seek to construct such "placeless places". Experimentation here appears as a broad range of different activities that share the capacity to engender reimagination, redescription and rematerialization of existing urban realities with regard to sustainable development. Throughout the chapters one may however identify different conceptual and empirical takes on this.

One distinct understanding of this city/experiment relationship is exemplified by Ch. 5. Here, cities appear conceptually as "complex adaptive systems with significant embedded dependencies built-in over the years of their construction" (p. 62). This approach, influenced by transition studies, foregrounds how the functioning, or failure of integrated infrastructures crucially shapes the functioning of human and nonhuman urban life and implies a notion of the experiment as virtual but indispensable prerequisite for successful change. Seeing the city as a set of layered and interconnected socio-technical systems leads Ryan et al. to conclude that "trying to re-engineer the city one sub-system at a time is bound to fail because new, often unpredicted, problems are likely to arise in another sub-system" (pp. 63-64). Therefore, they argue, a transition to a "resilient non-carbonaceous city" can only be realized through "a (rapid) transition from one set of socio-cultural technological-physical systems to another set" (p. 64). Experimentation in their view then, is a virtual exercise meant to test and build up these alternative subsystems and to prepare the grounds for the proposed rapid transition.

A second type of urban experimentation is explored in Chs. 14 and 16. Both analyse the case of Masdar, a so called "eco-city" planned from scratch and currently under construction in the United Arabic Emirates. Despite different foci, the authors share the observation that Masdar City is rather a fragmented clean-tech testing site, where too many actors – often profit-driven – through too many experiments – mostly product innovation – fail to assemble the promised eco-city. By the actors involved in Masdar's development the city is thus not so much perceived as a complex socio-technical system or itself the object and target of experimentation, but rather as a tabula rasa, where technological experiments can be staged and commercial solutions to sustainability issues demonstrated. However, as such, so the authors argue, this disconnected type of experimental platforms fails to induce sustainable urban development and to generate knowledge on the deployment of clean technologies in more complex and liveable urban contexts, that could lead to wider social transformations.

A third way of relating experimentation to the city is suggested in Ch. 11. Jana Wendler presents an ethnography of a community garden in Berlin as an alternative, emergent and bottom-up space for experimentation

with social organisation. In her account, experimentation is not at the outset of a policy or company driven project, nor is it explicitly designed as such. Instead, the grassroots community garden project develops over time – or organically, as the author puts it – into an alternative urban space, where different and unforeseen experiments can happen and individual as well as community learning can occur. The complex spatial and social entanglement of the community garden with the wider urban context allows, according to Wendler, "to take up a distinct and valuable role in processes of urban change" (p. 161) which is more open to diverse and sometimes marginal actors. In this conception of "open, extended real-world experiments" (p. 159), instead of virtually testing alternative futures or staging technological innovation on a tabula-rasa, experimentation is a highly situated and embodied activity, that "allows big issues to become knowable in everyday mundane, small-scale practices through the affective relations between body and material", but does not serve as a "replicable blueprint" (p. 160) for other cities.

What these spot lights demonstrate is certainly the sheer diversity of practices and projects that are being theorized as experimental cities or urban laboratories. But they also show what Evans et al. point out in their introduction; namely that "Experiments, understandings of experiments, and the attendant future visions they entail, are not inherently positive but carry politics just like any other development strategy" (p. 3). While STS readers may find that not all approaches chosen in the book are being equally attentive to these politics of experimentation, the rather broad and open minded approach to urban experiments adopted in *The Experimental City* certainly succeeds in mapping out a huge field for future research and conceptualisation, where a stronger involvement of STS scholars can be of benefit.

The relevance of STS engagement becomes especially clear in light of the books wider context. As Maarten Hajer points out in the foreword we are currently witnessing a "turn to experimental governance" (p. xviii), not just among scholars but also in practice. However, and this should be no surprise to an STS audience, scholarly publications like *The Experimental City* do not merely describe this experimental turn but actively contribute to it. Recent work of Hannah Knox provides a telling example of such performative effects of social theory: Knox describes her ethnographic encounter with Zeb, a British IT entrepreneur working on how "digital technologies might provide solutions for climate change" (Knox 2017, 356). As Knox explains, Zeb's own work is inspired by that of Frank Geels (2002) and other transition scholars, some of which contributed to the current edited volume. Based on this encounter Knox argues, that "new techniques of governance – the experiment, the unaccounted for action, the re-description and re-imagination of already existing practices as the basis for future action are crucial for understanding how contemporary governmental actors are imagining and formulating infrastruc-

tures of the future" (Knox 2017, 363). Such observations of performativity do not only affirm the relevance and timeliness of *The Experimental City*, but also the importance of substantial STS engagement with the issues it puts forward and the types of cities it enacts.

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Jennifer Gabrys
Program Earth. Environmental Sensing Technology and the Making of a Computational Planet, Minneapolis, University of Minnesota Press, 2016, pp. 368

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Program Earth is about the becoming environmental of computation. In this book Jennifer Gabrys attends to the (per)formative role that calculative and sensing technologies play as part of everyday and extraordinary environments. These spatializing properties have previously been remarked on in other academic disciplines. For instance authors in computer science (Weiser 1993), social science (Kitchin and Dodge 2011),

and media studies (Hayles 2009) have emphasised the complexities that arise as coded technologies and spatial operations become mutually dependent.

What makes Gabrys' contribution to this discourse distinctive is her propositional approach. She presents the reader with an engaged narrative on the role of sensors, computation, and associated technologies as part of everyday environments. Throughout the book she introduces encounters that range across different environments and involve different actors with wholly different intentions. In some of these, technologies are made explicitly visible, while others show them as part of the background, quietly going about their work. However, what all they have in common is the formative role of sensor technologies. In *Program Earth* Gabrys asks the reader to reflect on what this means. And, to accomplish this effectively, she develops a set of theoretical and philosophical assertions that carefully position the public alongside environments and technologies. Such an appreciation, she argues, can change how we are part of environments, how environments function, and how otherwise distinctive spaces are able to relate to each other.

The book could possibly have been called "Programmable Earth". Whereas a program refers to a structure that is followed, Gabrys intends to describe something else. She sets up computation, code, and data as part of encounters between environments, devices, and other entities to show how they become together. This approach is distinct from utilitarian narratives that promise technology's immediacy, neutrality, or efficiency; and equally from those critiques that point towards programmatic or disciplinary capacities. For Gabrys, sensors enable an "expanded engagement with programmability" that helps to consider "how code is not a discursive structure or rule that acts on things, but rather is an embodied and embedded set of operations that are articulated across devices, environments, practices, and imaginations" (p. 41). This distributed approach to action and encoding, links her work to theorists of more-than-human relations (Haraway 2016), co-production of politics and space (Jasanoff 2004), or other literatures that are hesitant to accept *ex ante* normative categories or deterministic relations. That is not to say that power and the potentials associated with technology are forgotten. A recurring theme is the distributed spatial effects including the issues that arise with access, constraints in use, and skills. However, her focus remains with interdependencies and the productive qualities that emerge from these operations.

Program Earth consists of three sections: "Wild Sensing", "Pollution Sensing", and "Urban Sensing" and each is made up of three chapters. The sections represent distinctive epistemic projects wherein sensors together with humans and non-humans constitute directed techno-geographic milieus. In the individual chapters Gabrys settles on a handful of empirical examples that follow comparable logics to illustrate a partic-

ular, often theoretical, contribution. While the chapters can be read individually, as they are relatively self-contained, all of them rely heavily on the introductory chapter. Throughout these first thirty pages the reader is familiarized with the author's spatial thinking that comes from constructivist roots, with Whitehead, Simondon, and Stengers being the primary interlocutors. Here she also introduces her key spatial metaphors: environment, milieu, and ecology.

The section on "Wild Sensing" describes remotely monitored environments that primarily serve human learning and understanding. This topic is explored to illustrate how sensors act on existent environmental relations. While the adjective "wild" in the section's title suggests these spaces are typically not considered subject to human intervention, the assumed distance between observed environment, the technologies that monitor, and other entities enrolled in the process of observation is questioned. Gabrys does this by stating that within these environments sensors operate "not as instruments sensing something 'out there' but rather as devices for making present and interpretable distinct types of ecological processes" (p. 29). Sensors and networks do not just extend the reach of people, but equally make environments show up as active. This fits with recent work in STS that turns to ontology (e.g., Law and Lien 2013) to focus on the contingency of events, objects, and entities. In doing so, Gabrys shows the generative potential of sensors to produce and couple previous unconnected environments with contextual knock-on effects.

A demonstrative example is Spillcam, a stationary webcam installed to livestream the 2010 BP Deepwater Horizon oil-spill. Gabrys shows how a single camera allowed for the distribution of interest to this environmental disaster by enabling the formation of new spaces, practices, and identities in response to it. It visualised the ongoing crisis, the scale of which would otherwise remained largely inapproachable and hidden to the general public. While turning to such a vision of an event evidently also leaves things out, the overarching thesis of the chapter is that sensor-based monitoring can draw those not immediately present into a relation to particular events.

In the chapters themed "Pollution Sensing" Gabrys explores the status and potential uses of sensors as having an impact on the coding of environments. By doing this, she strikes a more political tone as strategic and speculative applications of data to environments are considered. These, she argues, can contest otherwise taken for granted environmental relations. So where the first section explored how environmental relations work, here she qualifies what uses they afford to those affected by them. This involves the tapping into alternative repertoires of knowledge and possibly the remaking of environmental relations.

For example environmental citizenship is introduced as a category that runs counter to modern state-bound definitions of belonging. As the becoming part of a milieu, it proposes more open-ended ideas around

who or what should have a stake in the politics of environments. Gabrys inverts the "politics of environment" to "environmental politics" and extends membership to all entities with a stake in it. An environment's politics, she speculates, can be produced from within instead of being imposed from without. This is illustrated through sensor technologies that can act as speculative tools enabling positive engagements with complex issues like climate change, that for once do not have to pass through the state. Moreover, the assertion that sensors and the data they generate are relevant to how environments are performed comes with the consideration that this requires new forms of sensor-based participation. This revelation results into questions like: "What experimental forms of politics and environmental practices might we develop that are able to attend to these indeterminate and emergent matters of concern?" (p. 155).

Finally, in "Urban Sensing", Gabrys explores the potential of sensors and their networks to curate and control environments. She introduces environmentality as an inherently spatial form of governmentality, to show how sensors can pose a variety of challenges to environments and their constituencies. The smart city is the paradigmatic example of an environment where sensors are part of "universal visions" of lived environments that are "always the same in their striving for optimization" (p. 261). However, as a common thread the author argues for contingency and difference. Writing that there exist important frictions between regimes that privilege processual expediency on one hand and those that value privacy and comfort on the other. Not breaking character, Gabrys develops a set of strategies and tactics to deal with this as "to be simply in opposition is to be already defeated" (p. 291).

One tactic for critical reflection is through the conceptual persona of the idiot. This ideal person does not follow conventions, but instead questions constitutive characteristics that would otherwise be commonsensical. This inquisitive approach to sensor technologies allows a framing that is part of larger infrastructural narratives, where people can move beyond "simple choices" of subjectification between buy-in or opt-out, to more open conversations about alternative modes of engagement that make possible substantive participation in issues involving sensors.

To conclude, Jennifer Gabrys' book is a timely publication that combines empirical insights with a necessary speculative attitude in an emerging field. It complements earlier publications that critique or applaud the utility of sensors by embodying the "could be different" attitude so at home in STS. It works well as a companion with the work from Gabrys' own *Citizen Sense* project as it shows why these trajectories around emancipation, education, and action based narratives are important. Other productive directions are discussions on the democratic potentials of technologies such as those stemming from STS sub-disciplines like the public understanding of science and technology (Irwin and Wynne 2003). The abundance of possible connections the work make attest to its fit as

part of the current discourse on science and technology. Whereas by itself it offers a provocative and engaging read. To me its the propositional approach Gabrys follows, in combination with the rich empirical accounts on societally pressing issues, that makes it helpful in challenging the otherwise settled rules and roles of science and technology.

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Markus Krajewski, Jasmin Meerhoff and Stephan Trüby (eds.)
Dienstbarkeitsarchitekturen. Zwischen Service-Korridor und Ambient Intelligence [Architectures of Subservience. Between Back-Corridors and Ambient Intelligence], Tübingen-Berlin, Wasmuth, 2017, pp. 462

Andreas Meier and Edy Portmann (eds.)
Smart City. Strategie, Governance und Projekte [Smart City. Strategy, Governance and Projects], Wiesbaden, Springer Vieweg, 2016, pp. 346

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Smart cities, talk of the town. But are we about to construct a new urban architecture indeed – an architecture that will *serve* the needs of our cities better, in more efficient, more sustainable and more participatory

ways? These new architectures are hard to see; they are difficult to examine in detail, with nuance and without being blinded by a firework of promises. This is not because there are few "real" smart cities but because they are elusive, half vision and half practice, both municipal politics and global business, sometimes promotional façade, sometimes bland bureaucratic initiative, lauded as transparent while criticized as black box.

A special trick, hence, is needed to get a better picture. This trick, I propose, consists in reviewing two recent, rather distinct book in German language at the same time, reading them against one another. *Smart City,* edited by Andreas Meier and Edy Portmann, is, according to its back cover, a book for city planners, politicians, citizens and researchers in information systems. *Smart City* is full of advice, some of it premonitory, on how to put digital media to use on an urban scale and for urban concerns. The book proposes concepts, models and evaluation strategies in seven chapters: Smart Governance, Smart Participation, Smart Living, Smart Education, Smart Mobility, Smart Energy and Smart Economy – 16 contributions in total.

The second book, *Dienstbarkeitsarchitekturen*, edited by Markus Krajewski, Jasmin Meerhoff and Stephan Trüby, does not counsel but hijack its readers, taking them on a tour through the staff entrance, along the service hallway, beyond hidden doors and to the kitchen wing. With 13 contributions ranging from art history and cultural studies to sociology and media studies, the book explores architectures of subservience (German: *Dienstbarkeit*) – i.e., the carefully installed mechanisms, sophisticated yet unobtrusive, through which service has been achieved in the past and is achieved today. Anna Mader-Kratky (pp. 88-117), for instance, carefully examines the intricate architectural design and the practices of spatial coordination that ensured imperial service at the Hofburg, the Austrian Emperor's palace in the centre of Vienna. These practices increasingly (and in increasingly elaborate ways) isolated lifeworlds at court. Today, however, not emperors but customers rule. Marcus Termeer, in another chapter of *Dienstbarkeitsarchitekturen*, shows how "concierge living" and a renaissance of exclusive, door-manned housing complexes accommodate contemporary notions of service with the help of sensor and surveillance technologies.

The two books complement one another in standpoint and expertise. *Smart City* offers an abundance of technological expertise; it is pragmatic and affirmative, seeking to put emancipatory visions of smart city into practice. *Smart City* is best read as a compendium of infrastructural experiments in urban governance. Its chapter on Smart Participation, for example, contains three articles each of which approaches the challenges of civic participation in municipal management from a different angle. Martina Löw and Lea Rothmann (pp. 73-101) show how smart city initiatives such as electric car sharing are blurring conventional boundaries between private and public space, boundaries constitutive for Western no-

tions of 'good' society. Since public/private spatial relations in smart cities are likely to change, Löw and Rothmann call for more civic education and participation, buttressed by legal regulation. Jan Fivaz and Daniel Schwarz (pp. 103-129) respond to calls for more civic participation by outlining how smart cities, understood as techno-political laboratories, can use data to strengthen municipal democracy. Finally, Susanne Robra-Bissantz and colleagues (pp. 131-150) report from their experiences with an interactive platform for urban development that uses mapping and virtual reality technologies for "hands-on" participation.

Issues of civic participation get particularly salient once smart cities are managed in public private partnership (PPP). As Evgeny Morozov (2017) predicts, companies such as Alphabet are soon taking over vital urban services, a phenomenon he calls "Google Urbanism." Through PPP, smart cities will be equipped with an elaborate integration of sensors, data, Civic needs and services – "smart services" such as personalized public transport or discreet, affordable 24/7 assistance for the elderly. It comes in handy, thus, that *Smart Cities* outlines a way to account for the role of PPPs in models of smart city governance (Walser and Haller, pp. 19-46) while keeping smart cities "open" in terms of data access and participation (Habenstein et al., 47-71). However, browsing through the book's screen shots, diagrams, tables and flow charts raises the suspicion that the social, political and cultural implications of these smart urban service architectures are not yet understood. *Dienstbarkeitsarchitekturen* inspires to explore and frame such suspicions in terms of Kafka's imagery (Balke, 198-226), the imagery of architecture that is supposed to serve (the citizen, the king) but is gradually, and painfully, revealed to be a trap beyond anyone's control.

Dienstbarkeitsarchitekturen conveys a historical perspective, including a chapter about the ubiquitous domestic presence of slavery in the Roman Empire (Eigler and Lämmle, 50-85). The contributions in the book take a distanced stance, highlighting the ambivalent and intricate relations between master and servant, between power and its premises. Stateroom and kitchen wing may be worlds apart, and yet they form part of the same regime of power. Many of the contributions in the book, then, search for the viewpoint from which the fragility—the powerlessness—of power becomes visible. In their analysis of ancient architecture and the domestic life of Roman masters and their slaves, Eigler and Lämmle (71) resort to Hotel California, the 1977 Eagles rock song: "Mirrors on the ceiling, the pink champagne on ice / And she said, 'We are all just prisoners here of our own device'."

Dienstbarkeitsarchitekturen stubbornly returns to these oscillations between technology-mediated service and automated domination (also in Schürer, 288-329). Unflinchingly, *Dienstbarkeitsarchitekturen* focuses upon the power of infrastructures and infrastructures of power, unearthing their – sometimes conflicting (Potthast, 230-266) – regimes of control,

visibility and worship. *Smart City*, in contrast, is so attuned to questioned of municipal governance that it largely leaves aside broader issues of governmentality and power. The book has not yet found a vocabulary rich enough to put ambivalence and critique into practice. In *Smart City*, concern is most clearly voiced on the first page of its preface, written by Andreas Flückinger, chief of staff of technology of the city of St. Gallen: "The city of the future must not become the playground of IT-loving urban hipsters, neither a fully-surveilled paradise of leisure and consumption. The city must remain living space for everyone… The city is a community, not a consumer good" (Flückinger, ix). Flückinger seems to sense that well-meaning visions and neatly designed systems, in all their elegance and technical refinement, can go awry. *Dienstbarkeitsarchitekturen*, in turn, illustrates how technological visions and systems have taken effect in past and present, offering ample illustration of both the comfort and the constraint, the warmth as well as the cold discipline that 'subservient' technologies add to our lives—particularly well demonstrated in a chapter on Allan Wexler, an artist whose installations question the functionalism of modern architecture (Ruhl, 369-420).

No book shop, no library will stack these two books next to one another. No algorithm will recommend the one when you are about to purchase the other. But while both books are a good read for their intended audiences, taken together they offer a truly fascinating glimpse of what future research into digitalized urbanity and its infrastructures may look like. Future research will have to navigate the "gap between affirmative and activist" perspectives upon smart cities (Brauriedl and Strüver 2017), a task that requires it all: enthusiasm for heterogeneous cooperation, the willingness to embrace technological futures *and* the capacity to recognize its shifting, oscillating ambivalences.

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Giovan Francesco Lanzara
Shifting Practices. Reflections on Technology, Practice, and Innovation.
Cambridge, MA, MIT Press, 2016, pp. 304

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One of my favourite album of past months is *Rock'n'roll Consciousness* by Thurstone Moore. Singer, guitarist and architect of one of the most important bands on the contemporary alternative musical scene (Sonic Youth), thirty years since the beginning of his career, Moore has made a record that in my opinion strikes a perfect balance between 'old' and 'new', tradition and innovation, past and current. It is an album that ranges among different music genres (from rock, through punk, noise and dark, to free jazz and drone-metal) but which creates an amalgam of sounds that make the final result entirely 'natural'. It is a record whose tracks never last for less than six minutes (and in fact, in a couple of cases, exceed ten minutes), but they do not sound 'long', 'boring' or 'repetitive'. Dissonances and harmonies, suspended moments and sonic irruptions, rhythms that slow down and accelerate, are all played with such mastery that the novice and/or distracted listener may even not realize how much expertise lies beneath them.

But these trajectories, where careful composition and free jamming merge together, never lapse into a self-indulgent display of virtuosity or nonchalance because there is always a dynamism and impetus that do not leave time to get bored. In a sense, it is an album that not only expresses the author's approach and musical aesthetic but also asks the listener to position him/herself. The circularity of the melodies, in fact, transports the listener into the piece, and then asks him/her: do you like this music? Too predictable? Too experimental? Compared to what? What music do you usually listen to? What do you like about it?

But above all, what does this have to do with the book subject to this review?

Perhaps nothing. But because of my passion for music, whenever I have to review a book, I ask myself: and if it was an album? What album would it be? In most cases, I cannot find a sufficiently intuitive match to decide to use it as an outline for the review. But this time the match seems wholly befitting.

Firstly, like Moore's record, Giovan Francesco Lanzara's text 'sounds good' in the sense that the writing is enjoyable, rhythmic, rich with analytical concepts and reflections, as well as metaphors and references to art and literature.

Secondly, it is a book written by someone who, following a multi-year research career, expresses his own ideas without citing those of others. Lanzara, who has always carried out his research at the intersection

among organization studies, information systems and innovation studies, uses his research findings to reflect both on innovation as a bricolage and practice-based phenomenon, and on the methodological and epistemological principles useful for reading innovation in processual terms. In particular, Lanzara revisits two of his research studies: the first (conducted between 1986 and 1989) concerning the introduction of software for the teaching of music in a music school; the second (conducted between 1990 and 1993) concerning the introduction of video recorders in Italian courtrooms. Rather like some of the sounds in Moore's album, despite the amount of time that has elapsed, both cases 'sound' extremely current and exemplify the different phases, ambiguities, decision-making, imperfections, contrasting interpretations, "translations" (to use the ANT term) that characterize any process and innovation design at organizational level. Moreover, both are narrated with an attention to detail that engages the reader in a sort of "participatory analysis" of what is being recounted. The reader is provided with the tools and materials to follow the author in his narrative. At the same time, in this way, the reader has the opportunity to construct his/her personal interpretation of the events narrated, without this necessarily coinciding with the author's point of view. The search for "interpretative reciprocity" is, moreover, an essential move for the purpose of studying (and understanding) innovation as a processual phenomenon. The author focuses in this regard on the centrality of "backtalk", not so much in the Goffmanian sense as in that defined by Donald Schön (1983), as "reflective conversation with the materials of the situation". But unlike Schön (to whose memory the text is dedicated), for Lanzara "the materials of the situation" comprise not only the interaction among the designer/researcher, his or her partners, and the materials, but also "the researcher's conversations with his own research materials; the researcher's conversations with himself and his own theories; the second-order conversations between the researcher's and practitioners' stories and between their current and previous stories" (p. 42). The study of innovation phenomena therefore necessarily requires an approach which if not longitudinal nevertheless extends over time. Reading innovation in processual terms means giving innovation time to unfold in relation to the different "situations of practice" (p. 21) and to the various actors with whom it will come into contact. During this time, the meaning of innovation can change, and so too can the identities and interests of the actors involved. The flow of this time is characterized by the alternation of "transient" knowledge (and constructs): that is, "knowledge that is created in a process of design and innovation: a kind of transformative activity is carried out, and the knowledge is subsequently obliterated, transformed or transcended by the same activity as the process unfolds" (p. 217). Typically, this knowledge is "embodied in (...) artifacts, minimal structures, recombinant routines, ephemeral practices, incomplete representations and shifting stories (...)" (p. 217). These are "transient con-

structs" or "embodied hypothesis", that is: "hypothetical statement about how an object or tool could look, how it could or should be used, how the situation could be understood, and how the world could be organized" (p. 222).

Transient knowledge and constructs are ephemeral. Consequently, people often lose track and memory of them. But for Lanzara they are the moments on which it is most interesting to dwell in order to understand the trajectory of an innovation. While knowledge and constructs are ephemeral, they are also transient in the sense of "transitional", thus providing a "provisional 'anchoring' to some features of the situation that can be handled" (p. 224). It is therefore in these partial articulations and definitions that innovation takes shape, embodying materials, objects, ideas and interpretations that are sometimes lost, while others persist over time, but which in any case act as "temporary scaffolds for building new forms of knowledge and agency" (p. 246).

More than asserting a series of statements, therefore, Lanzara's text asks a series of questions: "What happens in an established practice or work setting when a novel artifact or tool for doing work changes the familiar work routines?" (p. 5); "What is revealed of a practice in the switch to a different medium? How are objects, activities, representations, and skills affected by the nature of the medium? How are our perceptions and idea of materiality and reality mediated by the medium? How is knowledge itself medium-dependent? And (…) in what sense is a practice a mediated world?" (p. 203). Moreover, "To what extent can an observer legitimately penetrate into the representations of the actors observed? What kinds of access are technically rigorous, socially feasible, and morally acceptable? To what extent is digging deeply into the actors' representations also a form of intervention, or perhaps intrusion, into them?" (p. 253); "How can an experiment be designed that would enable both the researcher and the practitioners involved in the project to develop relevant knowledge about the innovation process and reflect on their own theories, strategies and experiences while they are actually engaged in action?" (p. 37); "How does the subtle line between what is remarked and questioned and what instead goes unremarked and unquestioned affect the researcher's reconstruction of reality?" (p. 46); "When does the researcher notice the tools being worked with and the equipment on which she or he relies for carrying out ordinary research work? When are the things that surround her or him and support routine operations seen?" (p. 47).

As in the case of some of the sounds in Moore's record, there will certainly be those who say that they have already heard these questions (and, perhaps, have already found the answers). However, for Lanzara questions serve to problematize reality, and if they are well formulated, they lead to further questions, more than to definitive answers. From this point of view, it can indeed be argued (as Lanzara does) that: "what is

fixed as the reality – the accepted facts, the known events, the shared truths – also constitutes the experiential and cognitive limit of the inquirer, marks the boundaries of the hitherto known world, and the nature and quality of social interaction. And what is called reality coincides with the place and time in which the practice of reflexivity gets suspended" (p. 265).

Just as the keyword of Thurston Moore's album is not so much "Rock'n'roll" as "consciousness", so the keyword of Giovan Francesco Lanzara's text is not "practice", "technology" or "innovation" but rather "reflection". And reflection (like music) is never-ending.

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Bruno Latour
Piccola filosofia dell'enunciazione (con una nota di Jacques Fontanille) [*Tiny Philosophy of Enunciation (with a note by Jacques Fontanille)*], Roma, Aracne, 2017, pp. 68

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Providing an autonomous format to Bruno Latour's 1999 article "Piccola filosofia dell'enunciazione" [Tiny Philosophy of Enunciation] with both the original French version and the already published one in Italian, was the right move. Now that some years have passed since the publication of *An Inquiry into Modes of Existence (AIME)* (Latour 2013), it can result extremely useful to have at hand one of the sources, and one of the steps towards, *AIME*, in order to better understand and appreciate Latour's trajectory in its entirety.

This new version of Latour's article is accompanied by a useful afterword – in Italian and in French – by French semiotician Jacques Fontanille – "Dagli atti di enunciazione ai modi di esistenza" [*From acts of enunciation to modes of existence*] (pp. 43-52 and pp. 53-63). In such afterword, Fontanille clarifies the closeness and the distance between Latour's proposal and the original theory of enunciation, from which Latour draws, in order to track and describe the relations giving way to different modes of existence.

"Piccola filosofia dell'enunciazione" (PFE; Latour 1999) has been initially published in a festschrift dedicated to Paolo Fabbri, semiotician who introduced Latour to semiotics and with whom Latour signed his first science studies article. Fabbri, who is now the director of the Centro Internazionale di Studi Semiotici [International Center for Semiotic Stud-

ies] of Urbino, has decided to republish it within the book series of the Center, in order to give visibility to the relevance enunciation had in this first version of Latour's system of "modes of existence" or "regimes of enunciation".

In PFE, Latour indeed explores, for the first time in a general systematic way, the descriptive and comparative possibilities of the enunciational model developed within Greimassian semiotics and already used by Latour in more focused studies of science, technological artifacts, religion and law that have lead to *AIME*.

As Fontanille underlines in the final part of his afterword (p. 49 and p. 60), in between PFE and *AIME*, Latour discovers the French philosopher of modes of existence Etienne Souriau, thus replacing "regimes of enunciation", concept that appears in PFE, with "modes of existence". Consequently, in *AIME* acts of enunciation do not prime anymore and "enunciation", though not absent, is replaced by "instauration", another concept proposed by Souriau. For Fontanille such "ontological turn" is problematic not only because puts semiotics – which has had a key role in Latour's construction – in the shade, but especially because puts into the shade, behind existences, signification processes (semiosis) and the sensitive experience, which, for Fontanille, are directly connected to enunciation intended as production of signification (p. 45 and p. 55).

Since the first formulation of the concept by French linguist Emile Benveniste, theories of enunciation have been elaborated in order to tackle the articulation of the relations between what is in a sentence or in a text and the situation of its production or of its reception. Greimas and his collaborators have proposed a general model of enunciation in order to describe and analyze these relations and their various shiftings, not only for verbal language, but also for gestures, images, artifacts, etc.

Since at least the end of the '80s, Latour has found Greimas' model very useful in order to account for acts of mediations, or "sending" or "delegation" or "passing" (pp. 10 and pp. 26). Such model is articulated in three basic instances:

1. the enunciation, or "pass" for Latour
2. the enunciate, or message or "what is passed", the "quasi-object" in the case of Latour, in which traces of the enunciation can be tracked
3. the relation between an enunciator (3a), the sender, or "who/what passes", and an *enunciatee* (3b), the receiver, "to whom/to which is passed".

This last relation is mediated not so much by the enunciate, the message, like it would be in communication models, but by the enunciation, by the pass.

Besides these instances, the Greimassian model, and hence the Latourian's one, considers two main dynamics: disengagement (shifting-out) and (re)engagement (shifting-in). In the first case something – an

enunciate for Greimas, a quasi-object, for Latour – is produced, given existence or "instaurated", by detaching it from the enunciation; in the second case, there is a return to 3), the relation between the enunciator and the *enunciatee*.

Latour, by exploring the combinatorial possibilities of the previous features, tracks and describes nine "regimes of enunciation", which make up the blueprint for the first nine "modes of existence" of the fifteen considered in *AIME* – mind that the names chosen for these first nine "regimes of enunciation" described in PFE are not always the same used for the first nine "modes of existence" described in *AIME*, although their configuration is basically the same.

In PFE, Latour starts by considering "regimes" that do not exploit all the instances: "Reproduction", in which a being (enunciator) passes itself; "Substitution", in which there are only passes without termini, nor quasi-objects; "Omission" or "Belief", in which only the quasi-object takes place, without basically any pass.

Then, Latour considers those "regimes" that present a full-fledged articulation of the three instances: "Technique", in which the quasi-object is completely disengaged from the relation between enunciator and *enunciatee*; "Fiction", in which there is a disengagement of the delegates of the enunciator and the enunciatee and their world in a quasi-object; "Science", in which, alongside the disengagement of "Fiction", a complete reengagement, up to the relations between the enunciator and the *enunciatee*, is required.

Finally, Latour considers those "regimes" which are more concerned with the relations between enunciator and *enunciatee*, the quasi-subjects: "Politics", through which a collective "we" is disengaged and reengaged; "Religion" or "Love", in which continuous reengagements toward the enunciator or the *enunciatee* are carried out, producing an effect of extreme presence; "Law", which is concerned with the multiplication of the marks left by the traces of the enunciation. They allow connecting the quasi-object to various enunciations.

As Fontanille notices (p. 44 and p. 54), Latour's way of working is intrinsically semiotic. Nevertheless, Fontanille criticizes Latour for not being as radical as semiotics, i.e. for not completely discarding metaphysics and Being, something Latour could have done by focusing only on the "the stream of existence" (p. 44 and p. 54, my translation).

However, what Latour does is exactly this. By considering being (in lowercases in *AIME*) always as being-as-other, he tackles it only in "alteration", only as the result of multiple streams of becoming other. Given that, as also Fontanille acknowledges (p. 45 and p. 55, my translation), "alteration" is the only ground needed for semiosis to take place, it seems to me that also the second criticism Fontanille makes, about Latour forgetting signification processes in *AIME*, lapses. Latour, indeed, extends signification processes to all modes of existence, something that he ex-

plicitly says in *AIME*: "a sign [as] something that stands in place of something else […] remains a very general property that could define all types of senses and meanings, even the invisible beings that we have learn to capture in order to sketch the trajectories of being" (Latour 2013, 254).

By reading the dialogue at distance between the two French scholars we can then see various misunderstandings unfolding, which allow assessing the mismatch that today exists between Greimassian semiotics (or, at least, Fontanille's version of it) and Latour's ANT. Such mismatch stems from the different philosophical backgrounds of the two scholars: phenomenology for Fontanille; pragmatism for Latour.

I deem that the value and interest of republishing PFE does not reside so much in the fact that a reference to semiotic categories is more explicit there than in *AIME* or that in PFE Latour is more attentive to meaning processes – which, as we have seen, are relevant also in *AIME*. The value and interest of republishing PFE resides, instead, in the fact that by its conciseness and by the consequent continuous reference to the enunciational model, PFE clearly shows Latour's method of inquiry. The latter is the product of the same descriptive methodology he has always used, which is grounded in semiotics: a set of categories, forming what he calls an "infra-language", that are "first of all negative […] [and] do not designate what is being mapped, but how it is possible to map" (Latour 2005, 174). Through these categories, in this specific case provided by the Greimassian enunciational model, he is able to map the way in which certain beings circulate by passing from one situation to another. Thus, Latour's classification has nothing substantive and the various "regimes of enunciations" Latour is able to track and describe do not have anything to do with fields or social systems as, for instance, those outlined by Pierre Bourdieu or Niklas Luhmann, although some of their names could allow such analogy. Simplifying, I could say that Latour's one is an operation that takes into account only the syntactic level, leaving the semantic one to the situated enactments of the actors. Therefore, it radically differs from the way Luhmann, for instance, singles out social systems, on the base of semantic dichotomies like legal/illegal or possession/non-possession.

Piccola filosofia dell'enunciazione (con una nota di Jacques Fontanille) is a must-read for those interested in *AIME*, in Latour's thought or in Actor-Network Theory as a material semiotics and it could result stimulating for anyone interested in understanding how to describe and analyze complex relations, given the reflections the book provides on this matter, through both Latour's and Fontanille's contributions.

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Tiago Morera
Science, Technology and the Ageing Society, London and New York, Routledge, 2017, pp. 240

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In this book, Tiago Moreira makes an interesting operation. He takes the concept of ageing – not exactly part of the most popular STS vocabulary – and then breaks it into its parts and analyses the processes connected using the STS gaze. Recalling a metaphor always effective (and dear to the STS world), he "opens the black box" of ageing and the book witnesses what he found.

First, Moreira says that ageing is not just a demographic, medical, or economic concern. It is a repertoire of practices and an institutional setup that the author calls "ageing society". He makes clear his interpretative proposition: that the ageing society "is first and foremost a collective predicament, a swelling uncertainty concerning how to deploy procedures of scientific research and technological innovation in addressing ageing as an issue" (p. 1).

As STS scholars know very well, every collective predicament, every controversy – regardless of whether it concerns political, environmental, or health issues – implies sociotechnical arrangements, expert knowledge, power relations, and economic interests. The demographic data is not secondary, of course. The United Nations set the threshold of population's sustainability to 7% of people being 65 or older in any given country. In Italy, according to the last ISTAT report on the national population, the percentage of people being 65 or older has overcome that mark by far and is at 22%.

The same phenomenon is affecting all the so-called Western nations, albeit in different percentages. This means that the demand for healthcare services and funding of health insurance is increasing, as are the pressures on systems of formal care and on processes of informal care within families and communities. Finally, the demographic trend affects the political and cultural attitudes of society, which tend to become more

conservative.

Moreira proposes not to analyse only demographic data, but also to examine the ways in which we understand and manage the ageing process in society and how they shape our collective life (Ch. 1). His approach is derived from Foucault in that he offers a genealogical history of the present, focusing on the link between structures, practices and contingencies. He proposes to understand the ageing society as an epistemic assemblage, in which making procedures and institutions, techniques, and technologies shape how we see our society through a demographic prism. The ANT apparatus stands out in the book's toolbox: Michel Callon, Bruno Latour, John Law, Annemarie Mol, among others, discuss with gerontologists, demographers, epidemiologists, cultural geographers and economists (Ch. 2).

The author states that the ageing society is challenging the epistemic infrastructure of the liberal welfare state and the system of expert knowledge on which it relies. To demonstrate these transformations, Moreira invites the reader to rethink the relationship among birth, death, and migration. Races and migrations are indispensable concepts for understanding the constitution of the ageing society despite the fact that they have not until recently taken into account the management of demographic ageing (Ch. 4).

This omission seems to rely on a precise bio-political orientation that contrasts migratory flows on one hand and medical technologies and health services on the other as resources to mitigate some of the economic effects of ageing populations (Ch. 5). Due to this orientation, widespread in the 1980s and 1990s, "the relationship between health and longevity has become central to the problem of population because of the fact that the problem of population decline is the disqualified immigration and the fertility as a solution to the problem of demographic ageing" (p. 71).

The author investigates the same concept of chronological age – by the number of years lived since birth – which we use to measure a person's functional capacity or health. Moreira discusses how the diffusion of this analytical tool is linked to the requirements of precision and classification inherent in the information requisites of modern state bureaucracies and administrations. The author shows how this model is challenged by emerging epistemic and normative uncertainty about chronological age as a variable and marker for social and political rights and duties. At present, no alternative model has been imposed to replace chronological age with its age-specific norms, values, and expectations although its solidity and reliability has been questioned widely.

Chronological age is at the base of the Baltimore Longitudinal Study of Aging (BLSA), a massive U.S. public programme of investigation on ageing that has been funded from 1958 to the present day (Ch. 6). Moreira reconstructs the history of this programme and its epistemic repertoires to demonstrate how epistemic and methodological procedures

shape the ageing society: "Ageing is an individualized process [that] became entangled with a set of methodological procedures and practices encased in the longitudinal approach" (p. 117).

He then introduces a more recent key concept: functional age (Ch. 7). This consists of tools and instruments (e.g. the Work Ability Index) that measure and manage individual functional abilities and indicate the roles or tasks a person may be involved in. For Moreira, this concept represents the relation between work and technology and the ageing society, and it aims to "maximise older people's participation in the economy by identifying unused capacities and opportunities to employ them" (p. 120). Tracing the assemblage around the concept, Moreira unveils the epistemic tensions that it hides.

Another interesting object analysed is the Instrumental Activities of Daily Living Scale, a tool used in the assessment and planning of older people's care (Ch. 8). Moreira suggests that its relevance relies on the expectation of aligning aging-in-place policies with active ageing instruments. Following the genesis of this tool and analysing its contexts of use – that require the process of rational decomposition of daily life activities such as cooking, housekeeping, laundry, etc. – Moreira describes how the reliability of tools like this is constantly challenged by situated practices of customization of ageing-in-place tools to individual needs.

Finally, the author's last efforts lead to an analysis of the most recent epistemic scaffolding named "biomedicalization of ageing". Using Alzheimer's disease as a case study, Moreira emphasizes how this new platform is based on the frail alliance among biogerontology, mainstream medicine, and anti-aging movements (Ch. 9).

To conclude, this is a very interesting book, which proposes an unprecedented reading of contemporary society and the theme of the ageing population. It is not easy to read because the argumentation is complex; very articulate. It integrates theories, analytical tools, and empirical materials from different scientific fields and epistemic domains. Nevertheless, given the relevance of the topic and the innovative approach, it is certainly worth it.

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Trebor Scholz and Nathan Schneider (eds.)
Ours to Hack and to Own. The Rise of Platform Cooperativism, a New Vision for the Future of Work and a Fairer Internet, New York and London, OR Books, 2016, pp. 252

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According to the editors, *Ours to Hack and to Own* is a "guidebook for a fairer kind of Internet" built upon two pillars. First, democratic governance and democratic ownership are the fundamental aspects of platform cooperativism and, ultimately, the core topic of the book. In Scholz's words: "The term 'platform' refers to places where we hang out, work, tinker, and generate value after we switch on our phones and computers. The 'cooperativism' part is about an ownership model for labor and logistics platforms or on-line marketplaces that replaces the likes of Uber with cooperatives, communities, cities, or inventive unions" (p. 24). Second, the book tries to foster a (lengthy, complex and messy) process, rather than advocating technological solutionism. Basically, the collection provides a snapshot of an emerging phenomenon and, at the same time, supports the efforts of co-constructing it, by promoting and vouching for it. As Scholz and Shneider clarify, the book is a direct follow-up of their meeting during a two-day event about platform cooperativism, where they both participated to present their works: "Platform Cooperativism: The Internet, Ownership, Democracy" (New York, November 2015). Coming from two separated, yet converging, intellectual trajectories – Scholz main focus is on platform cooperativism (Scholz 2016), while Schneider's one is on shared ownership and governance (Schneider 2014) – the two embarked in this book project which resulted in a rich collection of short essays that, in my opinion, reads more like a manifesto for platform cooperativism than a guidebook for it.

In a historical moment when the imagined future of the "sharing economy", together with its promises, has been progressively unmasked and replaced by the dominant orders of so called technocapitalism (Suarez-Villa 2001), gig economy (Todolí-Signes 2017) or platform capitalism, platform cooperativism emerges as a noteworthy alternative. For STS scholars, who have always been interested in the politics of technology (Winner 1980) and the infrastructuring processes that shape and (re)configure socio-technical power networks (Mongili and Pellegrino 2014), platform cooperativism can represent a relevant occasion to look at these themes and at how they play out through Internet from a perspective which we might call of "inverse infrastructuring" (Egyedi and Mehos 2012). In particular, this anthology can act as a thought-provoking work supporting STS scholars to get closer to the theme, and looking at it from the vantage point of those ones who are actually shaping it. The

book does not use STS vocabulary or constructs and, strictly speaking, it is not an academic work. However, it does address the topic by deconstructing and addressing it at many different levels. The lead title – *Ours to Hack and to Own* – is emblematic to this regard. Aligned with hackers' practices the book provides scaffolding tools for creating, spreading and supporting platform cooperativism, by including chapters as design guidelines for its technical protocols, its social and cultural aspects, as well as the economic, legal and organizational ones linked to the institution of cooperatives. Central idea threading among the chapters is always the preservation of the ownership of all the value aspects – not limited to the economic ones – emerging from a platform cooperative. It is in this light that, in my opinion, "hack" comes to hint at the original hackers' culture and suggests platform cooperativism as "an hack to the system of platform capitalism".

Despite the number of topics dealt by the many small chapters can sometimes feel bewilder, I was positively surprised by how many of these chapters implicitly talk to each other and manage to square the circle for the materialization and sustainability of platform cooperativism, without betraying its founding principles. The followings are two valuable examples.

First, in her chapter, *Blockhains and Their Pitfall*, Rachel O'Dwyer raises a warning about the diffusion of the distributed database technology, known as blockhain. Mainly used for handling and accounting digital currencies and their transactions (e.g. BitCoin), blockhain is being adopted as a technological fix in other domains beyond the original one. However, O'Dwyer points out that "blockchain is what we call a 'trustless architecture'. It *stands in* for trust in the absence of more traditional mechanisms like social networks and co-location" (p. 230). She warns us that complex and time-consuming processes cannot be replaced by technical solutions and that similar technical tools must always be accompanied by broader considerations. In *From Open Access to Digital Commons*, David Bollier takes stock of the warning when proposing blockchain technology as means to shift from open platforms – where access is free, but value is exploited by platform owners and not users – to communal ownership and management of digital artifacts and their related values. Here, the case is made for seeing blockchain as a complementary tool to a complex social, cultural, and technological reconfiguration process. Second, in *The realism of Cooperativism*, Yochai Benkler elaborates on four fundamental challenges which platform cooperativism needs to deal with in order to emerge and consolidate, and provides indications on how these might be tackled. The most troubling one relates to the means of long-term sustainability for platform cooperatives: these usually build on the organizing practices of peer production, although this typically relates to volunteer contributions by people who already have other means of subsistence. Conceptually, platform cooperativism could rely on commons

governance (Ostrom 1990), but it would still need practical means to break the ties with capitalist investments in the long term. *Money is the Root of all Platforms*, by Brendan Martin, deals with this issue: he identifies in the private and market oriented investments a constant danger for platform cooperatives. A way out is to see finance and platform financing as a platform: turning finance into a (pervasive) platform cooperative.

Ours to Hack and to Own includes contributions by activists, hackers, entrepreneurs, policy makers and researchers who are actively engaged with the core topic of the book. Each chapter begins by introducing and defining a challenge, approach or key aspect of platform cooperativism and, in a few pages (pp. 4-5), provides a direct answer to strengthen, pursue or solve it. Although for some chapters the feeling of remaining too much on the surface it is stronger than in others, I personally appreciated the assertive tone, and the clear and focused messages of each chapters, regardless of the limited available space for problematizing issues and dwelling into the details. The book is structured around four main parts ("Something to Say Yes to"; "Platform Capitalism"; "An Internet of Our Own"; "Conditions of Possibility"). The first one serves an introductory scope: the conceptual bases that define "platform cooperativism" and clarify its foundations are captured here. The second sets of essays collects critical reflections on platform capitalism that highlight the challenges and opportunities in the existing on-line (or sharing) economy. With fifteen and twelve chapters each, plus two showcase sections, the third and fourth parts of the book are the most substantial ones. The former addresses issues concerning the practical design and creation of on-line platforms cooperatives. The latter takes a broader perspective and deals with the ecosystem that is needed to widely support a shared, democratic ownership and governance of Internet. The showcase sections include more than a dozen of one-page sheets each. These describe noteworthy examples of running platform coops and ongoing projects that support platform coops from an ecosystem point of view. It is a pity that the book ends without a bibliography or an end-notes section, and only with a minimalist "Further Resources" section.

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