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Learning the city through urban agriculture

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Abstract

Learning the city refers to collective processes through which urban inhabitants experience, negotiate, and shape urban contexts. In the past decade, urban scholarship has emphasised the significance of learning the city as a political act. However, the full diversity of potentials of learning the city through urban agriculture remains underexamined. Drawing on fieldwork with an urban permaculture collective in Seville, Spain, this article examines four processes of learning the city through urban agriculture and reflects on their potential for driving urban change. We label these processes as learning the city through: experimentation; embodiment; socio-nature; and conscientisation and ecological citizenship. In closing, the article reflects on how progressive, political forms of urban learning in one city firstly raise important questions regarding the social and political impacts of diverse forms of urban agriculture elsewhere, and secondly, offer potential pathways to enhance relations between urban and rural socio-environmental struggles.

Keywords

Learning, participatory action research, Seville, urban agriculture, urban community gardens

Introduction

Learning the city is a political act: a domain through which urban space is produced, lived, and contested (Allen et al., 2019; Choudry and Kapoor, 2010; Lawhon et al., 2016; McFarlane, 2011). Learning, in this sense, is not only about acquiring knowledge, but about collectively producing and negotiating new spaces, cultures, and practices. It is a critical process through which the social milieu of the city is made and remade through time at the intersection of human collective agency and the material urban environment.

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While the practice of urban agriculture has received significant attention for its social and environmental potentials (de Zeeuw and Drechsel, 2015; McIvor and Hale, 2015; Mougeot, 2005; Redwood, 2008), it has received scant attention as a learning process enmeshed in the wider production of urban space and urban life.

This article is particularly concerned with the process of learning the city through urban agroecology and permaculture as a way of contesting the capitalist, extractivist, and neoliberal city. Specifically, it focuses on forms of social and political learning that occur outside of formal education. Learning the city, then, describes a power-laden process whereby knowledge is produced, circulated, and mobilised. It concerns not only the production and communication of knowledge, but issues of power and identity across networked urban actors: "If knowledge is the sense that people make of information, that sense is a practice that is distributed through relations between people, objects and environment" (McFarlane, 2011: 3). Scholarship that mobilises the idea of learning the city is not limited to any specific framework, approach, or theory. Rather, the idea has been invoked to explore and make sense of a diversity of urban processes such as the use of urban public space (Sacré and De Visscher, 2017) and civic responses to crises (Robin et al., 2019). However, this critical idea of learning the city has not previously been brought together with the practice of urban agriculture.

Urban agriculture has been characterised by some as a challenge to neoliberal forms of urban management; as a response to the increasing commodification of urban space (Dobyns, 2004; Galt et al., 2014; Tornaghi, 2012). Yet, there is a need to better understand the 'how' of this response, and the potentials of different processes and practices to contribute to alternative forms of urban space and urban living. To this end, the idea of learning the city through urban agriculture represents an important but under-researched set of potentials.

Urban agriculture comes in many forms and is practiced at many scales; it is an everyday practice with multiple meanings. In 2014, it was estimated that 456 million hectares of land were cultivated within 20 kilometres of urban centres globally (Thebo et al., 2014). While large spatial estimates are useful for communicating the scale of urban agriculture, they cannot convey the heterogeneity of urban agricultural practices; from large-scale commercial farming and high-tech, high-capital innovations to recreational allotments, subsistence agriculture, and community gardens (International Resource Panel, 2021). Nor do they capture the ways that practices shift with geography and context or the ways that variegated forms of urban agriculture often coexist in close proximity.

This article begins from the notion that the diversity of forms of urban agriculture corresponds with a diversity of learning processes, which can be associated with divergent potentials for urban space and urban life. Based on the potential of urban agroecology and permaculture to enable participants to experience, negotiate, and shape urban contexts in ways that resist the neoliberal and exploitative city, the article addresses two related questions: how do urban inhabitants learn the city through urban agroecology and permaculture; and what is the significance of these forms of learning for socio-political mobilisation in the city?

We draw on the outcomes and insights developed through a participatory action research project conducted in urban community gardens in Seville, Spain with an urban permaculture[1] collective, La Boldina. The group emerged from a community-managed urban garden in 2017 and began to engage in a wide range of activities across the city. The analysis draws on qualitative and participatory video fieldwork that took place from 2016 to 2017. The participatory video-making processes were developed in the context of a wider engagement between the first author and groups of urban gardeners in the city.

This work is situated within a body of critical scholarship that views urban agriculture as being more than a technical practice and which interrogates urban agriculture as a socio-political process by deploying urban theory, political ecology and related critical approaches (e.g., Barron, 2017; Certomà and Tornaghi, 2015; Darly and Mcclintock, 2017; Purcell and Tyman, 2015). To this end, urban agriculture is viewed as, "a new and contested socio-spatial practice that is re-spatialising food and reshaping cities" (Granzow and Shields, 2020). This scholarship has brought a critical perspective and has, to some extent, reba-lanced the urban agriculture discourse, which had risked becoming too celebratory and over-promising on the potentials of urban agriculture to transform cities and deliver social justice and sustainability outcomes for their inhabitants.

The article makes two contributions to the urban agriculture discourse. The first is to offer a more nuanced and plural account of the learning processes that occur through the practice of urban agriculture. The second is to unpack how these learning processes unfold in relation to particular cultivation philosophies, practices, and socio-political outcomes, and thus how urban agroecological learning practices can represent opportunities for new political forms of learning the city.

The following section presents an overview of critical geographical conceptions of learn-ing the city and maps them against the field of urban agriculture. The third section intro-duces the case study of La Boldina and presents our findings through four processes of learning the city through urban agriculture. The concluding section reflects on the extent to which the forms of learning through urban agriculture contribute to the idea of learning the city as a continuous, collective, and political process.

Learning through urban agriculture in discourse

In the past decade, a critical urban agriculture discourse has problematised and nuanced our understanding of the significance and limits of urban agriculture within contemporary urban contexts. Urban agriculture has been heralded as a set of practices that can deliver multiple health and social benefits (Ilieva et al., 2022), but which can also reproduce dynam-ics of marginalisation and exclusion (Wolch et al., 2014) and neoliberal governmentalities (Ernwein, 2017).

There are three strands of urban agriculture literature that are relevant for this research. The first is a critical engagement with the politics of space, which, drawing particularly on Marxist and Lefebvrian scholarship, interrogates what is *urban* about urban agriculture (Eizenberg, 2012; Purcell and Tyman, 2015). Urban agriculture has been interpreted as an opportunity to reverse the metabolic rift caused by urbanisation (McClintock, 2010), which generates ecological and social disorder across urban and rural areas, and which alienates urban inhabitants from nature. However, while urban agriculture may contribute towards mending the metabolic rift, the embeddedness of any such activity within a broader neolib-eral context often complicates or blunts its transformative potential (Sbicca, 2015).

The second, influenced by the vibrant North American discourse on food justice (Alkon and Agyeman, 2011; Alkon and Mares, 2012; Cohen and Reynolds, 2014), we see critical scholarship focused on the identity politics of urban agriculture (Aptekar, 2015; McClintock, 2014); who benefits and who does not, and how this relates to racial inequal-ities, capitalism, patriarchy, heteronormativity, and other intersecting axes of power. This strand is particularly important for examining the significance of urban agriculture for contributing towards community autonomy (Giraud, 2021) and self-determination (Colson-Fearon and Versey, 2022). For example, *Orti urbani*, occupied urban gardens in Rome, have been identified as radical collective claims for an alternative city through

autonomy and self-management (Mudu and Marini, 2018). Elsewhere, scholarship from North America has warned that despite the potentials of urban agriculture to support struggles for racial equity, for example through black-led urban agriculture projects in Detroit (Tolleson, 2015), "without explicit valuation of food justice... urban agriculture strategies may primarily benefit the propertied class and newcomers rather than disadvantaged communities" (Horst et al., 2017: 90).

The third relates to the potentials of urban agriculture for socio-political transformations of food systems and society more broadly, often through the evocation of concepts such as urban agroecology and food sovereignty (Carolan and Hale, 2016; Tornaghi, 2012). Scholars in this area have identified the potential for urban agriculture to be a socially transformative activity, "where political activism and place-making from below find a fertile ground for merging and mutually constituting each other" (Certomà and Tornaghi, 2015: 1124). More recently, research has begun to identify the contribution of small-scale, discrete urban agriculture projects to city-wide socio-political transformations (Bach and McClintock, 2021; Yap, 2019).

Learning processes appear consistently but unevenly across the urban agriculture literature. For example, urban community gardens have been recognised as places in which gardeners routinely learn from one another (Barthel et al., 2010); through institutional learning programmes (Göttl and Penker, 2020); and through informal, unstructured, and incidental learning processes (Rogge et al., 2020). Urban gardens have also been characterised as important spaces for intergenerational learning (Della Valle and Corsani, 2010). Hake (2017), for example, provides a comprehensive review of the forms of intergenerational learning identifiable in the gardens, including the socialisation of children and young people. Such approaches, which emphasise the *who* and the *how* of learning, are undeniably valuable for understanding processes of knowledge production and exchange. However, they fall short of the more political conceptions of learning that have emerged in the field of urban geography and elsewhere.

Critical urban scholarship has framed 'learning the city' as a continuous, lived and social process, whereby urban inhabitants experience, negotiate, and contest urban environments (Elwood, 2004; McFarlane, 2010; Natarajan, 2017). Learning the city occurs intentionally, but also incidentally, through urban inhabitants' spontaneous interactions with each other and with the city; it is a function of values, narratives, biases, and memories, knowledge(s), and encounters with social and material environments. How we learn, then, is continuously supported and challenged by social interactions; "what matters the most is not where learning happens but how learning with others engages with questions of 'where', 'with whom', 'how' and 'why'" (Allen et al., 2019: 356).

This approach to learning recognises that different forms of knowledge – tacit, codified, experiential, etc. – inhabit social relations that exist in time, space, and context. This pushes us to engage not only with the knowledge-content of learning, but the relations and processes through which knowledge is produced, interpreted, and actioned. Problematising and making visible these relations can contribute to the development of new political formations with the potential to reshape how cities are made and governed. As McFarlane (2011: 153) describes:

> Critical urban learning involves questioning and antagonising existing urban knowledges and formulations and learning alternative formulations. It entails exposing and unlearning existing dominant arrangements that structure urban learning practices and ideologies.

The idea of learning the city, then, goes to the heart of the urban political domain, describing both how cities are understood and how they are (re)produced. This speaks to central concerns of some forms of urban agriculture, such as those developed with political intent, which aim to reconnect "the sphere of reproduction to its ecological and physical substrate" (Tornaghi, 2014: 564), and even to remake cities in collective and radical ways (Purcell and Tyman, 2015). The city, then, can be both the site and the medium for transformative forms of collective learning, just as the process of learning can be both the site and the medium for a more progressive urban politics.

A critical approach to urban learning may open new routes to challenge hegemonic logics of urban governance, enabling us to make visible and celebrate plural forms of knowledge. It pushes us to interrogate interrelated learning pathways that emerge in dialectical relations with all urban space and situate their potentials within emancipatory readings of collective politics and urban social life. And yet, these political potentials of learning through urban agriculture have not been sufficiently examined, and they have not been characterised within a specifically urban epistemology.

Scholarship in the field of food systems has, for example, characterised urban community gardens as sites of public pedagogies (Hsu, 2019), through which "more holistic, cosmological notions of transformational learning" (Walter, 2013: 522) may emerge. And yet the specific change-making potentials of these forms of learning is not well understood. Almost in parallel, predominantly rural scholarship in the fields of agroecology and food sovereignty has highlighted the vital role of learning in enabling transitions to more sustainable forms of food production (Braun and Bogdan, 2016) through, for example, experiential learning (Francis et al., 2011), reflective learning (Francis et al., 2015), transformative agroecological learning (Anderson et al., 2019), and social learning processes (Schneider et al., 2009). Elsewhere, scholars such as Levkoe (2006) and Crosley (2013) have argued that food struggles may be processes through which people "learn democracy", with practical and political implications beyond the governance of food systems. And yet the urban dimensions of these learning processes are not well explored in the food systems literature.

Another body of scholarship has considered the impacts of different forms of learning found within urban gardens on the wider city. Glover et al. (2005), for example, argue that the diverse forms of learning found in urban community gardens can be significant for developing citizenship, while Bendt et al. (2013) have argued that learning in urban gardens can play a critical role in reconnecting urban inhabitants with the biosphere. In this vein, the argument made by Schmelzkopf (2002), that New York's urban community gardens became the focal point of conflict in the contested narrative of urban space, perhaps resonates most closely with critical conceptions of learning the city. Overall, however, the significance of urban agriculture, and urban community gardens more specifically, as ways of learning the city as socio-political construct, remains underexamined: largely abstracted from the specifically urban forms of learning through which cities are produced, experienced, and contested.

Despite the diversity of ways that the learning potentials of urban agriculture have been characterised, the field remains too narrow to capture the relational nuance and multi-dimensional nature of learning the city as the genesis of a progressive urban politics. Understanding social interactions in the context of urban agriculture, and their contextualisation within specific practices and the wider urban environment can enable scholars and practitioners to identify and harness learning opportunities and to make sense of the potentials of urban agriculture within the neoliberal city.

Methodology

This article draws on a participatory action research project that took place in Seville from 2016 to 2017. The project aimed to better understand the social and political potentials of urban community gardens and to contextualise those potentials within the city's socio-economic trajectory. The project developed as a collaboration between groups of urban gardeners and a UK doctoral researcher (first author). The process centred on two participatory video-making processes through which groups of gardeners produced films about the gardens and the city. The motivation for the gardeners was to learn video-making skills and to gain some control of the narratives surrounding gardening projects, which were frequently photographed, filmed, and written about by outsiders. For a detailed description of the video-making methodology, see Yap (2022).

The video-making processes were supplemented by qualitative interviews, ethnographic observation, autoethnography, and archival research. Semi-structured interviews were used to deepen inquiry into themes and issues that arose through the participatory video processes. The interviews were informed by an adapted form of narrative inquiry, "[focusing on] an interest in life experiences by those who live them" (Chase, 2011: 421). Thirty-six interviews were conducted with gardeners as well as local residents, local academics, and members of civil society organizations.

Interview transcripts and video recordings were inductively, thematically coded by the first author. The themes identified through this initial coding formed the basis of four empirical chapters in a doctoral thesis, which included a chapter on the political potentials of learning in urban community gardens. This article represents a critical revaluation of that chapter as well as previously unpublished material through the lens of 'learning the city'. A further inductive coding of the chapter material resulted in the identification of four processes of learning that we discuss in the next section.

Case study description

In early 2017, La Boldina was formed as an urban permaculture collective within the occupied, community-managed urban garden, Huerto del Rey Moro in Seville, Spain. Huerto del Rey Moro exists on land that was previously the private orchard of a large house in Seville's Old Town. The garden was 'rediscovered' in 2004 by local residents and activists, hidden behind the high walls that line Seville's narrow streets. It is managed through a monthly assembly that involves more than 50 residents and regular users of the space. The garden is divided into growing areas and a large, open public space that is used by families daily, and which hosts festivals, markets, workshops and other events. In 2017, the growing areas were managed according to a combination of organic and permaculture principles, including small individual plots – *bancales* – and larger communal growing areas. The land is owned by the City Hall. However, the garden has a measure of security from eviction as historic architectural ruins on the site mean that is unlikely to be developed.

Tensions within the community regarding the planning and management of what is a relatively small (approximately 2000 square metres) and much-used space led to some of the regular users of the garden, specifically those with an interest in permaculture, to actively seek other areas of the city to cultivate. They formed a group, La Boldina, whose name is a feminine derivative of the plant Falso Boldo (*Plectranthus Neochilium*), a drought-resistant plant in the mint family, indigenous to Latin America, which formed a central part of the group's permaculture practices.

In 2017, La Boldina comprised a diverse and informal network of 30 to 40 individuals of a wide range of ages and backgrounds. Engagement was entirely voluntary, and the group did not profit from their activities; within the research period there were no financial transactions related to the group of any kind. Some of the 'members' were retired, others in part- or full-time work in a wide range of occupations including teachers, gardeners, architects, service industry workers, artists and performers. There was a high level of precarious employment particularly for those working in the tourism and service industries. The group comprised a mix of native *Sevillanos* and migrants, mainly from the Mediterranean region, particularly Portugal and Italy. Some were keen gardeners, involved in Huerto del Rey Moro and other urban gardens on a daily or weekly basis; others were attracted to the group for its approach, politics, and philosophy, inspired foremost by permaculture. As one member described:

> La Boldina is a muddle of lots of people with completely different lives, organised together to learn and create a green paradise. (Interview with male gardener, Triana, May 2017)

La Boldina's activities were concentrated around the Macarena neighbourhood within Seville's ancient city centre. Macarena's narrow streets are hundreds of years old; high walls materially separate the public streets from the spacious gardens and courtyards of large private residences. Throughout the nineteenth and early-twentieth centuries, Macarena was a working-class district, populated by tile-makers and artisans. However, these working-class residents made little material impact on the architectural fabric of the neighbourhood. The neighbourhood has a long history of communal housing, political organising, and collective artisan workshops. However, many of the high walls have survived to the present day and continue to reinforce dynamics of privacy/exclusion. Macarena was one of only two neighbourhoods in the city to resist Franco's forces at the outbreak of the Civil War in 1936. Macarena's history of artisanship, communality, and resistance still forms a central part of the narratives used to convey the identity of the neighbourhood, and justify contemporary activities (Yap, 2018).

Four processes of learning the city through urban agriculture

This section is organised around four processes of learning the city within La Boldina, learning the city through: *experimentation*; *embodiment*; *socio-nature*; and *conscientisation and ecological citizenship*. These processes speak, in different ways and to different extents, to the idea of learning the city as a continuous political process.

Learning the city through experimentation

La Boldina carefully and deliberately developed a collective culture of learning that was characterised by material and social experimentation. Critical to this culture was the idea that La Boldina was a safe space "to make mistakes" (interview with a male gardener, Macarena, May 2017). Material experiments, some of which precede the formation of La Boldina, included structures such as a shade dome built from reclaimed materials, a communal bread oven, and *bio-rollos* (large arches constructed from wood and other material from the garden, which support climbing plants and increase humidity). In one notable growing experiment in a local school garden, members of La Boldina grew an orange tree on asphalt using tiers of soil and compost supported by concentric cinder blocks. The experiment aimed to show what was possible in terms of growing plants on land that is

not considered suitable for agriculture. Other 'experiments' included developing new approaches to seed saving, fermentation, and preservation. Others still were more organisational, for example through weekly and monthly participatory assemblies characterised by continuous experimentation with novel forms of organization, facilitation and negotiation. These experiments not only help to foster a community around the gardens but contributed to their distinctive social and material character.

Huerto del Rey Moro does not have a homogenous community, and there existed significant differences of opinion between groups in the garden. However, there also existed a mutual tolerance for experimentation and error-making, which is critical to the culture of inclusion:

> For me this space has allowed us to experiment with permaculture. But we also want this space to be open for those who don't share our dedication to permaculture... We don't want anyone to feel left out. The garden is a space for environmental experimentation, in fact, life experimentation. (Interview with female gardener, Huerto del Rey Moro, April 2017)

This idea of 'life-experimentation' encapsulated the ways that in the context of the garden the social and ecological domains became blurred; experiments in cultivation and water management were reflected in experimental forms of consensus-building, debate, and planning. To some extent, the material experimentation in the garden resonates with forms of experimentation observable in other disruptive food-related initiatives such as Farm Hacks (Maughan and Anderson, 2023) and guerrilla gardening. However, in Huerto del Rey Moro, the experimentation was accompanied by a sense of permanence and ownership rooted in a particular site that is often less salient in these other models that centre experimentation. While experimentation was often productive, it could also lead to conflicts between individuals and groups regarding the management of the space, as well as conflicts regarding communication and decision-making processes. However, read through a lens of learning the city, these conflicts can be understood as necessary moments of insight and possibility; it was only by challenging norms and creating discomfort that new forms of social and spatial order could emerge.

The culture of experimentation speaks to the idea of learning the city as a process through which knowledge is remade, repurposed, and put to new uses outside of the formal urban economy and political spheres. Experimentation with novel practices speaks directly to the notion of learning the city by challenging dominant conception of the urban as a non-agricultural space and by actively developing new forms of decision-making and urban management. Perhaps experiments will fail in their intended purpose, or partially succeed (i.e., 'mistakes') – it is, however, the process of experimenting and learning from these experiments in non-conformity that opens new possibilities for making urban space anew.

These processes of learning through experimentation were complemented by other processes of learning that are more specific to the urban permaculture practices, which we term learning through embodiment and learning through socio-nature.

Learning the city through embodiment

A key process of learning for the gardeners of Huerto del Rey Moro and La Boldina is a form of sensorial and tactile learning that is specific to the practice of urban agriculture, and which represents a significant process of learning the city. These processes, importantly, reflect oft-invisible practices that are on the margins of recognition (Roy, 2011). Research in

other contexts, particularly South Asia, has mobilised the concept of embodied learning to challenge and extend the boundaries of the urban political domain and to recognise the heterogenous practices through which urban inhabitants articulate political claims (Chattopadhyay, 2012).

Within a permaculture approach, water management is central to every aspect of cultivation. This is particularly important in the context of Seville, the city with the second highest average temperature in Europe. La Boldina gardeners spent hours sifting soil, burying rocks, and selecting plants for their root structures to enhance the underground flows of water through the garden of Huerto del Rey Moro. Through these activities, and the labour required to gradually transform the subterranean profile, the gardeners began to draw connections between their work in one small site and the longer history of water management in the region, starting with the Moorish settlers and extending to the present day.

As they worked, the gardeners talked about the history of the garden and the processes that led to the current condition of the soil. These conversations enabled collective reflections on the social and economic processes through which healthy soil is produced and maintained in urban contexts. Broadly, the gardeners suggested that the knowledge and willingness to maintain healthy, productive soils had been vital to the ancient city and had continued for centuries, and that it was only in the twentieth century that urban inhabitants had become disconnected from issues such as soil health, water management, and urban ecology. Whether or not this narrative aligns with the historical record, what is revealed is how embodied, tactile practices supported the social, ecological, and political forms of learning and reflection.

The gardeners frequently discussed the effect of water management on the water table; they carefully selected plants with deep roots that they believed could access the groundwater. However, they had no measurable way of observing the water table. In a sense, learning about root structures, as well as hydrological and nutrient cycles, represented another form of learning, another epistemology: one that is, on one hand, emergent and collective, and on the other, unsystematic and unscientific. This form of learning neither superseded nor validated other forms of learning, but rather complemented other social learning systems that emerged in the urban gardens.

The gardeners also described a "connection between the water and the social" (male gardener, Casa del Pumarejo, June 2017, second participatory video process). La Boldina increasingly saw social and ecological processes as enmeshed; influencing and reflecting one another. One culmination of these ideas was in the "Perma-formance" conducted by La Boldina as part of the *Barrio Abierto Fiesta* in May 2017. *Barrio Abierto* (Open Neighbourhood) is an annual festival in Macarena in which community-based organisations, artist and artisan workshops, and community centres open their doors to the public. Thousands of people visit the neighbourhood throughout the day, and there are parties in the streets until late at night.

La Boldina delivered a public performance through the streets, beginning in Huerto del Rey Moro and ending in the square outside Casa del Pumarejo. The performance took the form of a story, told by one member across four different sites. Other members of La Boldina played music and danced through the street to accompany the storyteller and lead a crowd towards the Casa. Jaime, the storyteller, described turning into water and experiencing the flows of water through the city:

This water droplet began to grow. It grew right in my hand. Little by little that water slowly grew into a puddle. It spread and spread until I had to cup my other hand, trying to hold all the water. The water kept growing and growing. It began spilling through my fingers and my wrists. The water

began to spill down my arms until it formed a stream. This stream hit the ground. In that moment, I felt something truly special. I felt as if I was falling over. As if I was melting and falling to the ground. I became the puddle of water. But the peace I felt quickly vanished. I slowly began drifting into a sewer. I tried my hardest trying to escape but it was impossible. I held my breath trying not to smell the wretched smell of the sewer. Then in that moment something miraculous happened. As I fell, I got sucked through the earth. I went through the pavement and through the ground and was penetrating deep into the earth. I could feel and smell the fresh soil. I understood that I had reached the roots of the tree that was planted in the middle of the plaza. I began my slow and tranquil journey. Little by little I went up the roots and slowly became part of the tree. (Jaime Garcia Malo, Plaza del Pumarejo, May 2017, second participatory video process)

This story expresses a fundamental philosophy of La Boldina, emphasising the relationships between natural and social processes; as one gardener often reminded the group, "we are made of water". The 'perma-formance' concluded with the ritual planting of *Falso Boldo* in the public square outside Casa del Pumarejo and the demonstration of a grey water filter, followed by a talk on regional water governance by a local academic. The aim of the performance was partly to raise awareness about the group and their cause, but the process of developing the story and choreographing it through the streets, was important for the group in giving them a space to develop and articulate their vision for La Boldina, and for a greener, more water-conscious future in Seville. This form of learning, which began with soil sifting and burying rocks, speaks to the ways that learning the city emerges through everyday actions and encounters and the process of learning through doing and through embodied performance. It demonstrates a form of learning that is particular to the practice of urban agriculture, as well as the potentials of this form of learning to connect insights across socio-ecological scales. These embodied learning practices are complemented by broader reflections on – and extrapolations from – the urban environment, what we term 'learning through socio-nature'.

Learning the city through socio-nature

Many of the gardeners in La Boldina used natural systems to think about and learn about social processes, which we refer to as learning through socio-nature. This occurred in at least two complementary ways. The first was by looking at natural systems, specifically the management of water, as a way of evaluating social, political, and economic structures according to the successes and shortcomings of the natural system's management. The idea that social and ecological processes are intertwined has been extended to mean that disharmony in one system can be deleterious to the other. For La Boldina, this meant that social development was closely tied to sustainable land management and environmental stewardship:

That is one of the principles in the garden culture: take care of people, take care of the land, and distribute resources. So, I think this is a good place to start, identifying where there is too much of something and giving it to another place. (Female gardener, Huerto del Rey Moro, June 2017, second participatory video process)

The second was through the creative use of analogy. These were not rigorous or necessarily consistent analogies, but rather relied on perceived shared abstraction between natural and social processes, and an assumption that there are sufficient commonalities to consider one complex system as analogous to the other. For example, the gardeners described the

transmission of ideas through society as analogous to the spread of seeds and plants across a garden. When the gardeners talked about their future visions for the group, they talked about spreading seeds that grew into their own groups, rather than necessarily scaling up La Boldina or developing any form of coordinated organisational structure. One gardener referred to this as the difference between growing as one organism and spreading seeds in the wind. The aim was not to develop into a large organisation or centrally coordinated network, but to inspire other groups and individuals to develop their own structures and processes for decision-making, discussion, and action. The strategy was working. The number of sites that the group was working in increased from 7 in July 2017, to 20 by March 2018. Throughout 2017, the group continued to grow in a very decentralised fashion, with different members managing different projects at different rates.

MacKinnon and Derickson (2012) warn communities and activists against applying natural processes analogously within their organisations, arguing particularly that the concept of *resilience* can be conservative when applied to social relations. However, in the case of La Boldina, this form of learning represented only one aspect of a deep and multifaceted engagement with permaculture principles and learning the city. Rather than being a fixed or constraining mode of thinking, the gardeners used analogies creatively and productively. The idea was not that social systems mirror ecological systems, rather that juxtaposing systems, and using one to explore the other, opened new ways of thinking and learning about complex themes. While it is not possible to say conclusively why learning through socio-nature in this case led to progressive learning outcomes rather than conservative ones, there are some contextual factors that we believe made this progressive outcome more likely. The first is the discursive history of the neighbourhood as a site of resistance and community self-organisation. This takes the form of emotive stories about the history of the neighbourhood a century ago, such as Casa Cornelio, the meeting space of anarchists which was destroyed by fascist artillery in 1936. The second is direct personal links with other radical social occupations, such as the nearby neighbourhood association-managed Casa del Pumarejo, a former palace that fell into disrepair before being occupied and reclaimed by residents in the nineteenth century and the radical social centre, *Casas Viejas*, 2001–07. This historical and contemporary context has served to visibilise occupation as a mode of urban living. In this sense, the occupation of a house by La Boldina, discussed below, represents a coming-together of permaculture philosophy and social history.

Beyond organising themselves and their networks in a way that is analogous to natural networks of communication and exchange, the group developed an epistemology rooted in natural systems and which profoundly transformed their engagement with permaculture and the city. This epistemology, articulated through the analogy of a 'forest' of knowledges, not only shaped how they interpreted and engage with urban processes, but how they reflected upon their own positionality and practices:

> *Society and power are like a forest. In the forest, you have many different types of greenery. Permaculture is just one type of tree. There are trees that, for example, represent academic knowledge. For some people, this knowledge ranks higher than permaculture. This is all based on the culture and principles that they learned at home when they were young, which they carry with them when they grow up. They could say: "You know what, this branch of permaculture is casting a shadow on my academic knowledge tree." So, they go and cut this branch off. This doesn't mean that permaculture is consuming the rest of the trees, it simply means that permaculture could be growing in spaces where other trees such as academic knowledge aren't blossoming. (Male gardener, Triana, May 2017, second participatory video process)*

This analogy helped the gardeners to reflect on competing and contrasting perspectives regarding urban food production and conflicts within the city. It not only made the members of La Boldina more sensitive to difference, in contrast with some of the confrontational politics that defined Huerto del Rey Moro's monthly assemblies, but also helped them to justify and develop their sense of value in a permaculture approach, not only to gardening, but to urban living. These ways of learning with and from nature have shaped the way the group organised to enact social and ecological change in the city.

Some insights that arose in processes of learning through socio-natures have very practical implications for the organisation in terms of its governance, management, and strategic direction. For example, the group began to engage with aspects of urban life that are unrelated to the environment or food systems and collaborate with other urban associations such as *Asociacion Vecinal del Casco Norte de Sevilla* (Neighbourhood Association of the Seville's North Old Town), an anti-gentrification group. For some members of La Boldina, gentrification and urban displacement represented violent acts that disrupted and destabilised the social networks that characterise urban neighbourhoods. This disruption was understood as analogous to the way that deep tilling, practiced almost universally in industrial agriculture, breaks up benevolent networks of fungus and roots in the soil, reducing its capacity to hold water.

Another outcome of learning through socio-nature is that some members of the group have started to occupy empty houses in Seville and began to articulate this as akin to natural processes in permaculture. The emergence of La Boldina coincided with the occupation of an abandoned house in the North of Seville that took on a particular significance for the group. Of the six people that lived permanently in the house in 2017, three were members of La Boldina. The house became a de facto meeting place for some members of the group, where they planned their activities and shared meals.

Significantly, some members of the group drew on permaculture principles to justify their occupation and, as they saw it, their duty to restore the empty house. For some, the restoration of the house was analogous to cycles of decay and restoration that occur in nature, and they had the same moral imperative to restore unused houses that they do to compost food waste; making productive use of material waste as well as the socio-political opportunities that such a community space presents:

> Well, the house project is something that I wanted to do. To work on a green house. It was a community project that interested me. I can relate this to permaculture. It's about recovering a space, and an area that was abandoned. Like a certain sort of urban compost… It's about recovering this space so that we can live in and create life. Not allowing this property to die. (Male gardener, undisclosed location, May 2017, second participatory video process)

> For me the house is a permaculture project, it's the same. It means a relationship with the land. What we are trying to do in the house is a form of urban permaculture. (Interview with male gardener, undisclosed location, May 2017, second participatory video process)

The restoration activities were conducted collectively, using natural and reclaimed materials. The group re-plastered the exterior of the house, repainted the interior, and made it into a liveable and inviting place. The group also made a conscious effort to build positive relationships with the neighbours in the street. On one hand, this is a practical strategy, common to occupied buildings, to decrease the risk of eviction or complaints to the police. On the other hand, it also evidences further the centrality of networks and relationship building as a default, permaculture-inspired strategy to improve the urban environment.

The three forms of learning outlined above, learning through: experimentation, embodiment, and socio-nature, have opened new ways of thinking about urban life and urban management and the socio-ecological relations through which they are produced. The fourth learning process, which we term 'conscientisation and ecological citizenship' builds from these foundations and refers to the ways that learning the city, for La Boldina, was emerging as a site of progressive politics.

Learning the city through conscientisation and ecological citizenship

La Boldina was an urban project infused with diverse politics, but with a strong emphasis on aspirations towards autonomy, citizenship and critical learning, with implications for the political ecology of the city. This connection between specific forms of learning and the wider city can be viewed as a process of learning the city through conscientisation and ecological citizenship. The intent to link the inherently physical and practical learning (of permaculture practices) with learning about wider political context and contradictions and the intent to intentionally act on that learning reflects what Paulo Freire (1996) termed "conscientization", which describes the ways that individuals and collectives build critical consciousness, and which can lead to more emancipatory politics. For example, as described above, the theme of water was central to the process of conscientisation within the group, whereby members of La Boldina began to connect their work to the wider political economy of water management in the region. Through careful attention to the water table in one urban garden, the group began to reflect on the privatisation of water management in the region, and the impacts that different socio-technical regimes had had on hydrological systems at the catchment level.

This learning process is further enacted through ecological citizenship, which exemplified the extension of the group's philosophy into the political sphere where their collective activities are debated and practiced as political acts of producing the city. The idea of ecological citizenship, here, refers to citizenship that revolves around a harmonious relationship between a democratic political community and a thriving natural world (Latta, 2007). This resonates with what Wittman (2009) has termed, "agrarian citizenship", a form of active citizenship based on individual and collective connection to land and the natural environment. However, the idea of agrarian citizenship has been applied almost exclusively in rural contexts.

The permaculture gardeners of La Boldina talked openly and frequently about their permaculture vision as a manifestation of their political aspirations and reimagining of inhabitancy in the city. For some, permaculture meant supporting the development of a "self-sustaining ecosystem" (female gardener, Huerto del Rey Moro May 2016, first participatory video process). For others, it was about minimising the strain on natural resources; about allowing nature to work as it should to grow food and provide ecosystem services for communities in a way that frees up people's time for other activities. For others, the idea of permaculture implied community self-sufficiency. Overall, the vernacular vision of the group was related most consistently to ideas of sustainable development and the collective stewardship of nature:

> Permaculture is an opportunity to create a sustainable human habitat and for sustainable development. Working with nature and not against it. Taking care of the Earth, our mother. Taking care of people who are on this earth and sharing the resources. (Male gardener, Hinojos, May 2017, second participatory video process)

However, there were minor differences regarding the idea of self-sufficiency within the group. For some, permaculture and self-sufficiency went hand in hand. As in Huerto del Rey Moro, the group frequently discussed the importance of *autogestion*, "self-management" (see Yap, 2019) and autonomy. Permaculture and urban gardening were conceived of as a prefiguration of a self-managing the city. For some, it seems that permaculture had become a way of operationalising some of these ideas, in theory, if not in practice; 'self-sufficiency' became a by-word for small, self-managed communities and food production. For others, the ideas of self-sufficiency and autonomy was expressed more in terms of building networks – even a social movement – to contest the global industrial food system and ultimately carve out social and political space away from the State. This is not a critical tension, but it evidences diversity within the group's aspirations for transforming society.

The idea of non-State-centric forms of citizenship was implicit in much of La Boldina's discussions. For example, one member of the group expressed the idea that access to and the capacity to manage urban green spaces was a part of their agency as citizens in a city:

> For a person to be well they need to be close to trees, close to plants, close to the land. When I am far from these things I feel like less of a citizen. (Female gardener, Parque de Alamillo, May 2018, second participatory video process)

This resonates, again, with Wittman's notion of agrarian citizenship; however, this is a distinctly urban articulation of the idea, dependent on access and usufruct of urban green spaces, rather than ownership of land or control of the modes of production. This notion of citizenship is not State-centric; there is no discussion of the responsibilities of the City Hall to guarantee or defend citizens' rights to urban green space. Rather, it is an idea of citizenship that depends on social networks of support, exchange, communication, and solidarity to be realised.

This is in accordance with anarchist conceptions of autonomy that "have emphasised the unequal power relations involved in everyday activities and interactions and have sought to develop forms of self-management that eschew, subvert, and challenge mechanisms and institutions of governance that structure everyday life" (Ince, 2012: 1653–1654). Members of La Boldina, then, are experimenting with conceptions of citizenship that do not rely on status, but on action, relationships, and a connection to the natural environment.

This is reflected in the complete absence of desire, on the part of La Boldina, to engage with City Hall or other formal political processes. The group is entirely invisible to the City Hall; with the exception of Huerto del Rey Moro, none of the gardening projects associated with La Boldina were included in an unpublished 2016–2017 report of urban gardens in the city. In Huerto del Rey Moro there was a similar scepticism, but a more generally open attitude to dialogue with City Hall.

In the case of La Boldina, the ways that they are learning about urban processes through permaculture pushed them further and further from formal, mainstream politics, and towards a more self-managed and self-legitimising conception of urban citizenship. Most significant, however, is the idea of a form of citizenship that is dependent upon and in dynamic relation with a local, urban interpretation of permaculture philosophy. Permaculture became a lens that allowed groups of urban gardeners in Seville to identify new opportunities for action, as well as new responsibilities within the city. However, these opportunities were not exclusive to the permaculture community. But what is novel is the specific constellation of learning through conscientization and ecological citizenship that arose through their urban permaculture practice.

Concluding remarks: learning the city through urban agriculture

This article presents four interrelated processes of learning the city through urban agriculture, providing insight into the potential of permaculture, urban agroecology and urban agriculture to contribute to the production of an alternative to the neoliberal city. Together, these four learning processes represent a place-specific combination of potentials to learn the city in a way that critically unpacks and reimagines urban relationships and provides strategic impetus and direction for urban change.

In practice, the four learning processes support and compound one another. The first three processes – learning through experimentation, embodiment, and socio-nature – are mutually reinforcing: a culture of experimentation enables plural forms of knowledge and learning to emerge and become institutionalised in the management of the garden; the interrelations between social and natural processes enable creative approaches to learning through analogy and supports political mobilisation across social and environmental domains. The fourth process – learning through ecological citizenship and conscientization – cuts across the other three; it both supports the other learning processes and represents their intersection with wider urban socio-politics; conscientization is simultaneously a product of and process through which collective and political forms of urban learning interact with the wider urban project.

These four learning processes, combined, represent much more than a pedagogy for growing practices (Braun and Bogdan, 2016), developing citizenship (Glover et al., 2005), social learning (Schneider et al., 2009), or a mode of reconnecting people with nature (Bendt et al., 2013). The practice of learning the city in the gardens of La Boldina and articulated in this article, in many ways, brings together these different forms of learning identified across the food systems literature, applies them to an urban context, and expresses them as the building blocks for re-inhabiting urban space and transforming the relationship between the human, natural and built environments. This reflects not only an individual process of transformative learning, but a collective socio-political and more-than-human, imperfect yet promising learning process.

In La Boldina, we see the emergence of a specifically urban, and specifically Andalusian, permaculture that reconciles classical permaculture principles with the local social, ecological and political urban contexts. Through engaging with permaculture in a multitude of ways – as practice, as analogy, as political philosophy – La Boldina are inspiring a nascent permaculture movement in Seville and generating new opportunities for engaging with the city. Most immediately this has changed the way that the gardeners think about the city as a connected whole, rather than an as a spatial aggregation of unconnected systems. This resonates with experiences in other cities that have seen small-scale urban agriculture projects act as crucibles for radical forms of urban experimentation and socialisation (Mudu and Marini, 2018). What is unique, however, about the case of La Boldina is the way in which permaculture philosophy has interacted with radical elements of social history to embolden a distinctly urban, distinctly *Sevillan*, socio-political movement. The question remains about how to enrol a great number of humans, non-humans, networks and urban spaces into these learning processes in and through projects like La Boldina. Equally important is to consider how these learning processes, drawn out of this specific Andalusian experience, can inform intentional practice and the process of learning the city in other contexts, to embolden urban agricultural spaces as a transgressive project in and against the unjust neoliberal city. Finally, pioneering groups like La Boldina are operating at the intersection of critical and collective approaches to learning that have emerged across both urban and rural discourses. A challenge, then, to researchers is how this intersection can be enhanced and developed to

further advance our understanding of the political potentials of social learning processes, and to build bridges across urban and rural food movements.

La Boldina represent just one example of how urban agriculture can support a radical reimagining of urban environments and urban life in contrast to the extractivist, neoliberal city. The positionality of the gardeners is critical to the particularities of this case, impacting not only how the group perceived the challenges facing the neighbourhood, but also the potentials of urban agroecology and permaculture as pathways to address them. We believe that the interactions between long-term inhabitants of the neighbourhood and new arrivals to the city created the conditions for alternative interpretations and values to emerge; cultural narratives regarding community self-organisation and resistance – pervasive in Macarena – were invigorated by ideas and practices introduced by newcomers. Members of La Boldina that had been long-term residents in the neighbourhood frequently expressed concerns that the city was managed in a way that did not serve its inhabitants. The 1992 Sevilla Expo, for example, received huge investment and still dominates part of the city, but was felt to have had little social or economic impact on residents. This sense of political marginality contrasted with forms of economic marginalisation disproportionately experienced by the newer arrivals to the city. As described above, the new arrival gardeners were far more likely than the long-term residents to be in precarious employment, reflected, for a small number, by precarious living arrangements. The group, then, shared diverse but common experiences of marginalisation within the contemporary city.

For those retired *Sevillanos*, we believe that La Boldina represented an organisational structure through which they could put into action long-held values concerning sustainability and claim space within the urban project. For those in precarious employment, La Boldina represented an opportunity to work meaningfully to deliver tangible benefits to the community through their labour. For both groups, permaculture became a language and a set of practices through which they could respond to contemporary urban challenges – marginalisation, precarity, gentrification, environmental damage, the privatisation of public space etc. – in ways that resonate with Macarena's social history. This combination of recent arrivals and long-term residents is indicative of the wider make-up of the neighbourhood. This suggests that the forms of learning identified in this research need not be confined to La Boldina, but offer a wider set of potentials for political conscientisation for residents that feel, in myriad ways, marginalised within the neoliberal city or alienated from its environment. This interaction between the identity and positionality of individuals and emerging collective projects and institutions in the process of learning the city represents an important area of further research, particularly in the context of urban agriculture projects by and for marginalised urban groups.

In the case of La Boldina, the process of learning through permaculture has a distinctly urban character; learning the city through permaculture has opened new thematic, strategic, and scalar opportunities for the gardeners to engage with urban processes. Learning the city for La Boldina was significant in so far it emerged through the collective work of a diverse group of people in a continuous, dynamic urban learning process. Through conscious and unconscious learning processes, the gardeners creatively multiplied their knowledge to produce insights about urban development, the shortage of affordable housing, and water management in Andalucía, amongst other issues.

These diverse forms of collective learning join a wider body of work on the right to the city and the production of the city itself (Purcell and Tyman, 2015). Gardeners are creating social value and use value by reconstituting disused and neglected material spaces as

valuable sites of potential, where new gardens can host new communities within the city. The forms of learning described here are not only significant for developing agrarian citizenship (Wittman, 2009) and reconnecting urban inhabitants with the biosphere (Bendt et al., 2013) but represent a new lens through which to engage with the urban reality. As this article has described, the production of the city is a dynamic and contested process, but by developing new and collective ways to learn and perceive the city, the urban gardeners enhance their claims to it.

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Note

1. Permaculture is a holistic set of social and agricultural design principles that seeks to integrate people into the natural environment in a way that maximises biodiversity and ecological resilience; it is a philosophy of working with rather than against nature. The term was first used by Bill Mollison (1988), who emphasised the integrated design of food, energy, water systems as well as human settlements. However, the idea also draws extensively on low-impact and indigenous farming techniques from around the world. Permaculture is broadly defined by a set of principles – rather than specific practices – that are interpreted in context. Each local interpretation of permaculture is likely to depend on other existing ideas and values.

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