If you start taking the cobblestones out of the street, people will pass by and ask you what you are doing. When you tell them, "Sous les pavés, le jardin!", they will begin dismantling the streets with you. A critical mass of antipode gardeners will emerge – the polis will begin to fall and new configurations will rise, take root.
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Beneath the Pavement: A Garden at Loughborough University & the Emergence of a Garden Society
differing ideologies around production and distribution. It was these loaded references that informed the direction of the project. It began with a three day workshop, visiting other sites where land had been used in different ways for varying purposes, and was followed by debate, discussion and cultivation. The discussion centred on analysis of systems and sustainable practices from which ideas were developed and mapped out. Each group interpreted the information and responded in different ways, both in the design of individual gardens and in the choice of plants.

While the artists clearly defined the parameters of their project, the nature of this type of practice means that its development is

Beneath the Pavement: A Garden was one of three new commissions by Radar to artists who were interested in our relationship to nature and using their work to communicate ideas and issues around sustainability, systems and actions.

Amy Franceschini and Myriel Milicevic requested that the University provide a plot of land as the focus for their project. A plot of land is not free of association; it can be viewed simply as a food source, offering self sufficiency and sociability but equally it is not without political connotations, raising questions around ownership, and
unpredictable with the participants shaping the artistic meaning in different ways. There is a dual economy whereby the participants help feed the work of the artist but at the same time the artist is making a contribution to the community in which they are working. There has been a defined longer term impact with the University agreeing that the land can continue to be used as a space for community gardening and debate. It will be run by a newly formed student society who has given themselves the title of ‘Landscaping Our Society’. This is a direct development of the workshops, initiated by two student participants, who have taken ownership of both the land and the concept and developed it into a dynamic space in which future students will debate and dig. For both the University and Radar this is a positive and exciting outcome of the project.

This publication not only creates a permanent document of the project but allows further exploration of the issues. It extends the ethos of the project by creating a shared space of discussion, not subscribing to a set doctrine but rather allowing those who engage with it to digest the information and come to their own conclusions. When asked if she regarded herself as an ‘activist’ Amy Franceshini remarked that she would rather be simply seen as ‘active’, using projects to engender debate rather than promoting a defined political cause. These principles are characterised throughout her practice and are to be applauded.

We are grateful for the commitment and energy shown by both Amy and Myriel and the other participants who have contributed to Beneath the Pavement: A Garden.

Nick Slater
Director, Radar
If all our eyes had the clarity of apples,
In a world as altered,
As if by the wood betony,
And all kinds of basil were the only rulers of the land,
It would be good to be together,
Both under and above the ground,
To be sane as the madwort,
Ripe as corn, safe as sage,
Various as dusty miller and hens & chickens,
In politics as kindly fierce and dragonlike as tarragon,
Revolutionary as the lily.

Bernadette Mayer, The Garden from Utopia, 1992
We often inform our economics, architecture, political structures and artwork with systems of nature. What happens if we reimpose these interpretations back onto nature or have plants assume roles based on interpretations of these systems? In Bernadette Mayer’s *The Garden*, an ode to a public garden, she imagines plants as models for remaking the world. And Lactantius in the early 4th century A.D. took issue with the Aristotelian and pagan doctrine of a spherical earth, to the center of which all heavy bodies were attracted. For Lactantius there could only be one absolute “up” or “down” and bodies on the “underside” of the earth would fall into the sky. Lactantius refused to entertain the existence of men living on the opposite side of the globe — the antipodes. As a starting point for this book and a three day workshop, these quotes provide an invitation to exercise the absurd, the “impossible” and not only to imagine what might be under the pavement, but to lift our feet and tickle the world that lives beneath us.

This book, *Beneath the Pavement: A Garden*, is an extension of our commissioned artwork at Loughborough University. The action of turning soil and physically articulating what had been imagined and discussed over a three day workshop unearthed new configurations, associations as well as the institutional constraints and the politics at play when working on private property. We begin the book with a brief documentation, Loughborough Plots, followed by a collection of essays, projects and proposals that provide a range of perspectives on the inherent complexities of the social and political organization of space. Political scientists Rosales and Duff use the garden metaphor to describe a brief history and currents of the social and political imaginary, Alex Toland and Gerd Wessolek literally take us down into the ground, examining the urban vadose zones and how they are affected by history and politics, while Richard Jones spans for us the history of civilization’s foundation — manure — from the earliest settlers, to the Romans, through the streets of European capitals, to the imbalanced relationship to our own excreta today. Henrik Lebuhn allows us to comprehend the larger picture of urban gardening action, the story of Thing 001359 (Chico Mendez Mural Garden) by Agency

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Is there any one so senseless as to believe that there are men whose footsteps are higher than their heads?... that the crops and trees grow downward?... that the rains and snow and hail fall upward toward the earth?... I am at a loss what to say of those who, when they have once erred, steadily persevere in their folly and defend one vain thing by another.

Lactantius
(250–325 AD)
shows in greater detail how politics and gardening battle for ground and often stand in conflict.
Pat Heslop-Harrison examines the culture of crop cultivation where economics directly affects the nature and diversity of edible plants.

In a small excursion to five fantastical States and Systems Beneath the Pavement, we consider how plant communities might be organized in technocracies, undergrowths, and commonwealths, where they follow economic rules of photosynthecracies, are ruled by gulls in kakistocracies and migrate into dormant lying pollinations. And Paula Hildebrandt takes us to the pavement in her palimpsest glossary of urban landmarks where people are turning cobblestones in their cities and building alternative models.

We close the book with a select list of resources that inspired this project such as Voltaire’s Candide. May the contents within this book take you on a similar voyage!

There is certainly a concatenation of events in the best of all possible worlds; for, in short, had you not been kicked out of a fine castle for the love of Mistress Cunégonde – had you not been put into the Inquisition – had you not travelled over America on foot – had you not run the Baron through the body – and had you not lost all your sheep, which you brought from the good country of El Dorado – why then, you would not have been here, to eat candied citrons and pistachio nuts.

That is excellently observed, answered Candide; but let us dig in our garden.

Pangloss in conversation with Candide, Voltaire, Candide
Land on the Loughborough University Campus

Beneath the Pavement: A Garden, considers biological forms in relation to political and social systems. Beginning in May 2010, on a plot of land at Loughborough University in England, a three day workshop offered participants a platform to design and create edible landscapes based on political systems. The workshop included a day-long bus tour, an open air seminar and a planting day. The bus tour traversed the local foodshed; the interconnected network of producers, composters, distributors, and markets who provide food to consumers. With contributions from a diverse range of artists, local politicians, activists, gardeners, anthropologists, and historians, collective debate on the planting day fueled the cultivation of six distinct sociopolitical “garden” plots. While some systems used techniques from traditional gardening, others questioned natural hierarchies and chose to bridge political systems. Many of the garden beds themselves were deconstructed in accordance with the systems they represented, hierarchical systems developed into spirals, and democratic systems divided plots equally with space for varied types of plants, while others resembled an ad hoc, post apocalyptic, anarchistic reconstruction.

At the close of our workshop we invited the group to discuss the possible future of this

The revolutionary process begins by shaking up the condition of everyday life and ends by restoring it.

Henri Lefebvre
plot. Excited by the infectious pressure of dirt under the nails, Loughborough students Alessandro Froldi (political science) and Daniel Bower (art) volunteered to coordinate the garden as a meeting place and food production zone. Since May 2010, they have been actively seeking participants to help tend the land and support this newly created garden and meeting place. There have been further plantings, workshops, tours to external gardens and an official student garden society has been formed.

This small plot on the Loughborough University campus has become a fertile site for experimentation; deconstructing existing systems of land use, planting stories, watching them grow and pollinate.
The space with its shed and its ownership by the students is a new and unique feature of the University landscape. At this moment, this brings the possibility to accommodate other student societies. From this site, we will share ideas which will cultivate the possibility of more student led projects developing out from this community.

Daniel Bower, Artist,
Loughborough University School of Art

We would like to thank Radar for their unending support and facilitation of this project and to all of those who attended the first three days of this digging to the center of the earth! We planted seeds, the rain came and now a vast network of roots are extending, beneath the pavement a garden has emerged. Thank you!

Amy and Myriel
**Landscapeism**

*Hillary Browne & Jo Kelley*

Post-Communism is a name sometimes given to the period of political and economic transformation or "transition" in former Communist states located in parts of Europe and Asia, in which new governments aimed to create free market-oriented capitalist economies with some form of parliamentary democracy.
Planting Plan
We started with a crowded, degraded bit of land (system). Some plants escape by knocking down the walls of oppression and heading for what they hope will be greener pastures, towards a new system.

Plants
Brassica: co-opted regime beneficiaries, lacking imagination
Radicchio: formerly oppressed workers
Sweetcorn: sweet talkers, politicians and bureaucrats
Nasturtium: formerly oppressed students
Fennel: heroic citizen spearheading the revolution
Lavender: promised land, beckoning them from a distance
Feudalism
Richard Jones

Feudalism is a political and military system between a feudal aristocracy (a lord), and his vassals. In its most classic sense, feudalism refers to the Medieval European political system composed of a set of reciprocal legal and military obligations among the warrior nobility, revolving around the three key concepts of lords, vassals, and fiefs.

Key to Design
1. Outer circle - three orders of medieval society, reciprocity and duties of care
2. Helix - great chain of being an unbroken chain from the least significant to the greatest
3. The ropes - forming the pyramid representing feudal hierarchy and inequality.

Plants
Ideally wheat, barley and oats. For the plot climbing beans were used.

Elites plants:
raisins, clove, pepper, saffron, cinnamon, mace

Planting Plan
In this scheme manure both binds - the circle - and dominates - the shaft. The power of kings, the basis of the western medieval economy is all founded on manure.
Soil Assembly
Rebecca Beinart & Alice Gale-Feeney

Anarchy is a political philosophy which considers the state undesirable, unnecessary and harmful, and instead promotes a stateless society (without the implications of disorder).

**Planting Plan**
An anarchic garden is not managed or gardened, it is left to its own devices and flowers and weeds are left to grow.

Soil samples are collected from different locations of the campus and arranged in a grid within one plot. The soils are left as found without any extra watering or other support, so that plants would sprout by chance and their own rules.

**Plants**
Any that will settle and grow.

**Key to Soils**
1. Garden of Remembrance
2. Admin Director’s office
3. Wild area at car park
4. Corner of cricket field
5. Innovation Centre
6. Manure pile by Bowling green
7. Dumped clay from test ground
8. Fountain water
9. Business and Economics
Territorial Dispute
Daniel Bower & Heather Knight

Imperialism: The creation and maintenance of an unequal economic, cultural and territorial relationship, usually between states and often in the form of an empire, based on domination and subordination.

Imperialism has been described as a primarily western concept that employs expansionist – mercantilist and latterly communist – systems. The term imperialism should not be confused with ‘colonialism’ as it often is. Edward Said suggests that imperialism involved “the practice, the theory and the attitudes of a dominating metropolitan centre ruling a distant territory’’. He goes on to say colonialism refers to the “implanting of settlements on a distant territory”.

**Planting Plan**

This plot symbolises the conflicts raised by access to resources and the resulting forms of invasion and global vs local dispute.

- Imported soil and plants are creating the basis of this plot.
- The highly aggressive spreaders might leap over and conquer the neighbouring plots, particularly
- the Soil Assembly system as a corridor connects the two. Foxglove forms the head of state, while grasses function as rampant invaders. Also strawberries and spider plants help increase populations, spreading to nearby plots. Climbing beans take over higher levels of airspace.
Monarchy is a form of government in which all political power is absolutely or nominally lodged with an individual. As a political entity, the monarch is the head of state, generally until their death or abdication, and “is wholly set apart from all other members of the state”.

Mt. Archy
Ruth Youngs & Graham Truscott
**Planting Plan**

A spiral with purple colored chives and sage at the top represent royal rulers. Other small plants like thyme have a hard time overcoming the long spiral path to reach the top. The lady’s mantle brings in gender issues at the base of the spiral. Climbing beans bridge over to the top, eventually becoming overgrown.

Mt. Archy was eventually invaded by blackfly and became a seedbed for spreading the fly to nearby plots.
Marigold Alliance
Stephen Laws & Paul Conneally

Health and Efficiency: An open relationship between the functional, edible and ornamental.

Planting Plan
Trailing beans, strawberries, fennel, purple sage, thyme, poppies, oregano, sunflowers, lavender and daylilies.
Field Scape: Projects, proposals and essays from various fields
In the history of political thought, metaphors that associate politics with the activity of gardening have been among the most influential and compellingly articulated. They are also among the most destructive ever devised. In this essay we seek to rehabilitate the metaphor of gardening for politics. While many of the projects documented in this book consider the way that gardens might illustrate political systems, we consider the way the experience of gardening might inform our thinking about the activity of politics – in terms of citizenship in addition to political systems broadly conceived. In particular, we suggest that the activity of gardening is a useful way to conceive of a politics in which citizens can develop profound and deeply rooted commitments to experiments regarding the best way to live in a community with others. These experiments, like gardening, will require hard work, creative thinking, problem solving, and sustained commitment. But most importantly, gardening reminds us that sometimes experiments fail. No matter how carefully we plan and how lovingly we cultivate, disasters occur, and the unpredictable happens – hail falls from the sky, blight appears out of nowhere,
and insects quietly devour. We must abandon some plants, pull up roots, and try it a different way next year. These are lessons that we can usefully apply to politics, which works best when citizens feel and act upon deep commitments to a notion of the good, but in which citizens are not fundamentalists regarding their commitments. Instead, they are open to reconsidering them, criticizing them, debating them, and abandoning them for a better approach.

**Cultivation and politics in the ancient world**

In the Greek polis, the ancient community most influential to subsequent political ideas, the tilling of soil and cultivation of plants played a crucial role in the political imagination. Politics was defined as an activity specifically opposed to the drudgery and perceived predictability of working with the soil. Politics shunned matters of sustenance and necessity, and instead concerned itself with considerations of the great and the glorious. A concern with nature and working the land was associated with slaves and women, whose lives centered upon this sort of work. In Athens, for example, citizens literally entered the space of politics by leaving their small farms and going into the walled center of the city to participate in the responsibilities of politics.

A politics that shunned predictability and necessity in the name of the risky and the glorious resulted in many triumphs. Evidence of Athenian glory remains today, in the Parthenon and other monuments to Athenian glory built in this era, or the profound tragic dramas written by Aeschylus, Sophocles, and Euripides. But this sort of politics also resulted in profound disasters, which helped to trigger a reconsideration of both the garden and the values of cultivation in politics. In particular, a ruinous war with Sparta and her allies triggered a retreat behind city walls where intense crowding contributed to a devastating plague. Pursuing the fight in an effort to reclaim the glory of Athens, the Athenians also became complicit in betrayals and genocide. The pursuit of glory for glory’s sake led Athens to lose her way.

It was in this environment that Plato introduced a new conception of politics that would rehabilitate the concept of
careful cultivation associated with gardens. Teaching and theorizing in a garden located outside the city center, Plato’s reorganization of politics centered upon careful cultivation carried out by a wise ruler in possession of a master plan. Plato’s political community, described in his *Republic*, was modeled on his image of an ideal social organization. These ideal “Forms” are accessible only to the wisest – a ruler (or rulers) who organizes society like a gardener does her plot.

Rather than tinker with laws, Plato argued the rulers should cultivate the people through a carefully planned educational system, so that they would grow up to know what they should do without needing specific legislation to guide them. They were to be shaped when they were young, like fruit trees espaliered in a courtyard.

Plato goes so far as to suggest the ideal political community must start like any garden, with a tilling of the soil to begin anew. He would banish all adults so that the ruler might start
afresh and place every member of society in their proper place like plants in their rows – deciding who will live where, do what sort of work, and even who will reproduce with whom. In Plato, the messiness and unpredictability of Athenian politics is replaced by the virtues of a garden – the calm and reassuring beauty of everything in its proper place, citizens given just what they need to grow in the way appropriate to them, and contributing precisely what is most appropriate to their capacity. Politics becomes cultivation. While Plato believed that his ideal city, like everything on earth, would eventually decay and die, he primarily presented his goal as establishing and enforcing stability. He spends a lot of time, for example, discussing various forms of censorship, trying to keep harmful emotions and ways of thinking out of the Republic – the way a gardener might keep rabbits and gophers out of the vegetables.

From cultivation to the political machine
Plato’s vision of politics had a profound legacy. Nietzsche entitled a chapter on Plato’s influence on the two thousand years that followed “The History of an Error.” To Nietzsche the essence of the error was Plato’s hostility to what is messy and unpredictable in human existence – Plato’s desire to escape from life’s ambiguities and inconsistencies into the clarity of ideals. This impulse was intensified in the Christian centuries in the form of a denigration of our sinful earthly existence in favor of the perfections of the heavens and the afterlife. Political power rightly belonged to God’s representatives here on earth. Proper citizenship, to the extent it existed, consisted of meek obedience. For the Christians the first paradise was a garden free of toil, and the difficulties of earthly existence, including the work of cultivating the earth, were simply to be endured.

But the rise in secular politics, both in terms of modern political thought and in terms of modern political systems, did not mark the end of the Platonic metaphor. Some secular moral and political philosophies recreated the Platonic ideal in contemporary terms – for example in moral philosophies like Immanuel Kant’s, which suggested the possibility of human reason guiding citizens toward perfect virtue. G.W.F. Hegel imagined we could approach an ideal in which human freedom is fulfilled through membership in a well-ordered state.
In another direction, rather than seeking to escape our distaste for the messiness, difficulty, and unpredictability of life, we sought to conquer it through knowledge, technology and expertise. Thus this period saw the rise of the bureaucratic state, in which experts and functionaries conceive of politics in terms of the management of the population and the economy. In this era politics is often conceived in terms of “policies” that encourage the safety, health, productivity, and wealth of the populace. Scientists, social scientists, policy experts and technocrats seek to manage the nation in a way that is analogous to Plato’s vision of the ruler with unique access to knowledge of the good.

One reason it might be useful to reclaim gardening as a metaphor for politics is that in reconfiguring Platonic ideas in empirical terms, these politicians and political thinkers pushed beyond the metaphor of politics as gardening or cultivation, and began to think more in terms of mechanics and machines.

The idea that the government should be an efficient machine was widespread by the 19th century.

In the U.S., Andrew Jackson spoke of his “hope of reducing the General Government to that simple machine which the Constitution created...”. The “political machines” exemplified by Boss Tweed and Tammany Hall dominated the American politics of the late 19th century. Max Weber worried about the compromises a politician necessarily makes to get such a machine to work for the purposes in which he or she believed. This was especially the case in the service of an ideal. “He who wants to establish absolute justice on earth by force,” Weber wrote, “requires a following, a human ‘machine’” (1958, 125). More generally, Weber believed a culture dominated by rational instrumental calculation – though that culture imagined itself the culmination of history – had produced a modern citizen who was best described as a “nullity”. He condemned...
the “iron cage” of modernity, in which society could settle into “mechanical petrification” as the “living machine” of bureaucracy dictated more and more of our lives.

These twin strands, utopian ideals about justice and order on earth, and confidence in the application of modern expertise to achieve it, were reconfigured in the totalitarian regimes of the 20th century, and many of the authoritarian regimes of today. Political theorists like Hannah Arendt, Michel Foucault, and Giorgio Agamben have all explored the ways in which patterns of thinking regarding politics as the quasi-scientific management of populations makes it, as Agamben puts it, “possible both to protect life and to authorize a holocaust” (1998, 3).2

Cultivating the middle ground of politics

It is in such a political environment, where the metaphor of politics as cultivation has been superseded by politics imagined as something more mechanical, that the activity of gardening might be reclaimed for political thinking in a more useful way. Gardening offers ways to conceive of a middle ground that might be usefully cultivated between several sets of extremes in thinking about politics.

Most broadly speaking, the activity of gardening might help us think about how to strike a balance between idealism in the Platonic tradition and those who would reject idealism extravagantly. The metaphor of gardening can help us to think about how citizens might make genuinely felt assertions about better and best ways to live as democratic citizens – and act upon them with diligence, deliberation and creativity – but also how we might be open to the contingency our assertions necessarily entail, and to the possibility that our projects might fail and have to be abandoned.

Political theory is just now emerging from a period in which many thinkers, often labeled “post-modernists,” contributed to the effort to show that apparent truths, ideals and notions are in fact fragile, contestable, constructed and contingent. It has been a worthwhile project, and one that has only sometimes earned the cartoonish characterization that post-modernists merely

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think “everything is relative” and that any idea, interpretation, or truth claim is as good as another. But certainly post-modern political thinking has put most of its energy and enthusiasm into the project of “deconstructing” established ideas rather than asserting new conceptions of how to live or organize a society. Foucault, for example, simply refused to speculate on the matter. But recent trends in political theory have sought to move beyond, as Stephen White describes it, “postmodern critiques of liberal political institutions whose attacks are long on hyperbole and corrosive language, but short on affirmative conceptualizations and orientation to concrete practices and institutions” (2000, 16). White would like to encourage more of these affirmative conceptualizations. And while we agree with him, below we suggest reasons why, metaphorically speaking, we are better off tearing up the concrete and digging into the soil below.

One way to think about how gardening informs political activity is in terms of a spirit of dedicated experimentalism. A common way for gardeners to discuss their projects is to say about one plant or another: “we are going to try brussel sprouts this year.” It’s a way of thinking that emphasizes both effort and unpredictability.

**Each cycle brings about new experiments, informed by previous knowledge, but nonetheless uncertain.**

Those experiments will require hard work and getting our hands dirty. We will have to respond to unexpected obstacles. While we might plan carefully and apply our reason, there is no sense that our plans can be exhaustive, nor that reason can anticipate or solve every complication. In gardening, as in politics, our experiments and projects are unpredictable, and we undertake them anyway. It is what makes gardening so absorbing.

And what gives gardening these qualities is that we are always...
confronted with the unpredictabilities of organic life, rather than the cleaner realm of pure ideas or clear calculations. As the theorist E.M Cioran argued in his *Short History of Decay*, seeking to banish Platonic reason from political thinking: “Everything that breathes feeds on the unverifiable; ... Give life a specific goal and it immediately loses its attraction” (1975, 10-11). While in gardening one has a goal or set of goals, we know that because we are dealing with the living our goal cannot be too specific and our methods cannot be fully known ahead of time.

But it is certainly one of the advantages of gardening as a political metaphor that gardens involve deliberate work, hard choices, and taking charge of a plot and asserting our will upon it. Too many political thinkers on the left seem eager to imagine a politics in which all obstacles (both ideological and practical) have disappeared and politics takes on a quality of ecstatic spontaneity. For example Michael Hardt and Antonio Negri, in their influential book *Empire*, argue that were humanity to no longer be “deluded in the pursuit of the ethical ideal” – ideals like those articulated by Plato and Kant – then “the multitude” might “organize itself spontaneously and [express] its creativity autonomously” (2000, 83). While gardening certainly provides an opportunity for creativity and self-expression, it also requires deliberate work and planning – necessary elements of politics.

**The garden and methodical thinking**

Before Hardt and Negri, the political theorist Hannah Arendt defended a notion of politics that she specifically contrasted to work. For Arendt, politics should be about humans interacting with each other and revealing themselves to each other. It must avoid fixed goals and instrumental thinking, which hinders the unpredictability and creativity, the “spontaneity and purposelessness” (1958, 177), that she believes is unique to the political realm. For Arendt, work implies mechanical thinking – which can transform politics into a process marked by, (as Mary Dietz summarizes), the “distortion of all things into means for the pursuit of allegedly higher ends, violent appeals to new orders and final solutions, and utter contempt for human personhood and individuality ...” (1994, 878). But Dietz suggests that politics and work might be conceived in

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terms of methodical thinking rather than mechanical thinking. Dietz borrows this term from the theorist Simone Weil. Weil, like Arendt, is concerned with the mechanistic and automated quality of so much of modern work and life. But rather than leap across to automation’s opposite – a sort of spontaneous creativity – Weil imagines a sort of work that might be both creative and deliberate; truly human and yet productive. Dietz seizes upon one example offered by Weil:

A team of workers on a production-line under the eye of a foreman is a sorry spectacle, whereas it is a fine sight to see a handful of workmen in the building trade, checked by some difficulty, ponder the problem each for himself, make various suggestions for dealing with it, and then apply unanimously the method conceived by one of them, who may or may not have any official authority over the remainder. At such moments the image of a free community appears almost in its purity. (1994, 878, quoting Weil’s Liberty and Oppression)⁸

Weil’s vision is an appealing one, though Dietz rightly scolds Weil for her impulse to think in terms of purity. Dietz suggests we might use this notion of methodical thinking to conceive of a methodical politics “where political phenomena present to citizens... challenges to be identified, demands to be met, and a context of circumstances to be engaged (without blueprints). Neither the assurance of finality nor the security of certainty attends this worldly activity” (1994, 881).⁹

But workmen in the building trade do have blueprints in most cases. Their goal is often quite specific, and their solutions highly technical, even when they are creative and clever. The gardener’s deliberate work to cultivate living things in a particular way comes closer to the more unpredictable and constantly shifting work of politics. It does more justice as well to the tragedies that politics so often entail. While there is always a way to get a building up, sometimes our garden experiments go horribly wrong. Sometimes the work we put into them goes too far – we kill what we hoped to protect, in cultivating one plant we allow it to choke others out of existence, or a battle with pests becomes a scene of slaughter.
It was because of the possibility of such tragedies authored by leaders and perpetrated by functionaries that Arendt sought to contrast political activities from the relentless demands and bottomless justifications of life’s necessities, dictated by the “circular movement of biological life” (1958, 19). But politics, especially in our era, will inevitably engage the biological: health and sustenance, the quality of people’s daily lives. Politics will make impositions on how people live, it will affect populations, it will do violence to some lives and provide assistance to others. We should not indulge in fantasies that politics can escape such engagements with the biological, even as we remain vigilant in our critical attention to the potential of abuses and pitfalls. The metaphor of gardening helps remind us that even as we carry out plans and cultivate a certain organization of the biological, we must attend to and respect the willfulness and autonomy of the life we encounter and with which we work. And these encounters will necessarily change our plans and elicit creative responses. Gardens do help produce our sustenance, but they are rarely only that: we value their beauty, and the time we spend at work in them. Unlike industrial farming, gardening does not invoke images of the use of technology, pesticides, and genetic monstrosities to accomplish our goals.

To offer a more explicitly political example, Franklin Delano Roosevelt responding to the Great Depression by calling for a period of “bold, persistent experimentation”. Such experiments, in the form of massive social policies, can profoundly impact countless lives in unexpected ways. This does not mean they should not be attempted. But it does mean we should be attentive to these unintended consequences, elastic in our approach, thoughtful about the lives affected, and should never lose ourselves in our drive to achieve a particular goal and never resent the messy unpredictability of our political efforts. In a political environment where no political intervention is immune to comparisons to communism and National Socialism, the garden can be reclaimed as a more complex and nuanced metaphor.
Politics between the city and the wilderness
So gardening as political metaphor might be reinterpreted to complicate the Platonic notion of escaping the messiness of politics for the stability of rule and cultivation and to complicate this concept’s modern manifestations in the bureaucratic state. If Plato’s turn to order and ideals is one way to escape politics, the escape into the wilds of nature is another. Hardt and Negri, advocates of spontaneity and autonomy, clearly long for the wild when they suggest that political analysis “has to descend into the jungle of productive and conflictual determinations that the collective biopolitical body offers us ... . The analysis must be proposed not through ideal forms but within the dense complex of experience” (2000, 30). Such longing for the wild was most movingly articulated by the first of the great theorists of modern democracy, Jean-Jacques Rousseau. But Rousseau’s

Francis Bacon, 1626.
From Ideal Commonwealths, P.F. Collier & Son, New York.
(c) 1901 The Colonial Press, expired. This book is in the public domain, released August 1993.
own attraction to uncivilized nature can help illuminate what is useful about the metaphor of the garden as a middle ground between the wild and the mechanistic excesses of modern life and politics.

Many of Rousseau’s contemporaries and modern predecessors had embraced the notion of applying reason not to the heavens or Platonic ideals, but to nature itself. In the 16th century (as Hardt and Negri note) Sir Francis Bacon called for bringing a “better use and a more perfect technique of the mind and the intellect” to “the most distant realities and the occult secrets of nature” and Sir Thomas More made “the ‘immense and inexplicable power’ of natural life and labor as foundation for political arrangement” (2000, 72-73). In the 17th century John Locke suggested that the use of our labor and the application of our reason to cultivate a particular plot of land was the origin of the right to private property and the foundation of political communities. Writing in the 18th century, Rousseau did not buy it. He wrote,

The first man who, having enclosed a plot of land, took it into his head to say This is mine and found people simple enough to believe him, was the true founder of civil society. What crimes, wars, murders, what miseries and horrors would the human race have been spared, had someone pulled up the stakes or filled in the ditch and cried out to his fellow men, “Do not listen to this impostor; you are lost if you forget that the fruits of the earth belong to all and the earth to no one!” (1987, 60)

Rousseau described in his Discourse on the Origins of Inequality what he preferred: the existence of a prehistoric “noble savage” who was no farmer, but rather lived independently, wandered the forest, and found in the wilds of nature all he or she needed to survive. But such a life, while noble and independent, would Rousseau admitted have been unbearably lonely. Elsewhere he admitted that,

Although in civil society man surrenders some of the advantages that belong to the state of nature, he gains in return far greater ones; his faculties are so exercised and developed, his mind is so enlarged, his sentiments so ennobled and his whole spirit so elevated that, if the abuse of his new condition did not in many cases lower him to something worse than what he had left, he should consistently bless the happy hour that lifted him for ever
from the state of nature and from the stupid, limited animal made a creature of intelligence and a man. (1968, 64-65)\(^\text{14}\)

The question was how to avoid the abuses of civil society, which Rousseau saw as principally an obsession with status and opinion.

Such, in fact, is the true cause of all these differences; the savage lives in himself; the man accustomed to the ways of society is always outside himself and knows how to live only in the opinion of others. (Rousseau, 1987, 81-82)\(^\text{15}\)

This distaste with society and its obsession with status drove Rousseau to become a bit of a noble savage himself in his old age, wandering alone in the countryside and pursuing his favorite habit of botany. Even then Rousseau indulged his distaste for the deliberate cultivation of plants, in terms that bring to mind the perils of Platonism, Kantianism, and contemporary technocratic politics. As he explained in his Reveries of a Solitary Walker, “confining our attention to… the botanical garden, rather than observing plants in their natural setting, we concern ourselves solely with systems and methods ….” (1979, 116).\(^\text{16}\)

But Rousseau also betrayed an unmistakable yearning for the garden as a middle place between the lonely wilds of nature and the busy, shallow sociability of city life. He described himself in his old age as a dying garden, with “a mind still adorned by a few flowers, even if they were already blighted by sadness and withered by worry” (1979, 37).\(^\text{17}\) He missed the days when he had attempted more than mere observation, when he had sought to be political. Describing his attempts to avoid any human encounters on his way “to go botanizing,” Rousseau recalled the pleasure he used to take in human interactions, and lamented that “so unfortunate a destiny as mine leaves little hope of performing any genuine good deed that is both well-chosen and useful.” Rousseau turned to the wild because he “knew that the only good which is henceforth in my power is to abstain from acting, lest unwittingly and unintentionally I should act badly” (1979, 94).\(^\text{18}\) The study of wild plants became Rousseau’s to escape the risks and unpredictability of acting with others – it was his form of a resignation from politics.


On the final page of that final book, however, Rousseau recalled a happier period where “in the space of four or five years I enjoyed a century of life and a pure and complete happiness, whose delightful memory can outweigh all that is appalling in my present fate.” In those happy years a young Rousseau, living with his protector Madame de Warens, did not merely observe nature but rather worked upon it in her gardens. There “all my hours were filled with loving cares and country pursuits. I wanted nothing except that such a sweet state should never cease. My only cause of sorrow was the fear that it might not last long, and this fear … was not unjustified” (1979, 154-5).19

This is always the risk of experimenting with gardens, with politics and with ways of living: the results are uncertain and things may not work. Even when they do work they may not last.

But these risks did not dissuade Rousseau from imagining worthwhile ways of living. They almost always occupied a middle ground between the wilds of untouched nature, and the busy uncertainty of modern society. He did so in the Discourse on the Origins of Inequality, where he told the story of the development of civil society, from the simple self-sufficiency of the noble savage to the wretched state of modern society in which everyone is a slave to the opinion of everyone else. There Rousseau described the age where the savage had settled down into simple family life: “This period of the development of the human faculties, maintaining a middle position between the indolence of our primitive state and the petulant activity of our egocentrism, must have been the happiest and most durable epoch” (1987, 65).20 But this era of small families cultivating small plots planted the seeds of its own destruction, as people began to observe each other’s successes and failures, and jealousy was born.
Rousseau’s other great works depict similar interludes of rustic virtue, no less inspiring because they were so ephemeral. In his letter condemning the theater he described the simple lives of Swiss peasant families, each cultivating their own plot of land. In Rousseau’s _Emile_ the title character explores the civic politics of his day, but decides to live in the countryside and till the soil. In his _Julie_, the Wolmar family cultivate a perfect rural community. Each of these rustic utopias is eventually undone. The Swiss get a theater and lose their simpler virtues, Emile moves to the city and watches his family be destroyed, Julie is undone by love and dies too young. But it was the beauty of Rousseau’s visions of an ideal, not his bitterness at their passing, that inspired Europeans to seek to transform their lives and their politics, and made Rousseau a saint both to revolutionaries and to quieter citizens.

**Gardening as a fruitful metaphor**

Two centuries on, John Stuart Mill’s _On Liberty_ offered a philosophical account of the liberal democracy those revolutionaries and citizens went on to create. There he praised experimentation and argued against viewing politics as mechanical. Humans, he said, cannot develop their capacities if they must act in rote, mechanical ways. Even worse, when humans stick to the same ideas and ways of doing things, “there is only too great a tendency in the best beliefs and practices to degenerate into the mechanical; and unless there were a succession of persons whose ever-recurring originality prevents the grounds of those beliefs and practices from becoming merely traditional, such dead matter would not resist the smallest shock from anything really alive, and there would be no reason why civilization should not die out …” (1929, 78). Humans do best, he argued, when they can make original plans and try to carry them out. No polis is perfect and precise, like a well-functioning machine, and if it were it would be too fragile, so humans gain when they make plans to try to improve the world while recognizing the inevitability of change. This is not because Mill believes that people will always make excellent plans and carry them out well. In fact, he thinks most plans will fail: “There are but few persons, in comparison with the whole of mankind, whose experiments, if adopted by others, would be likely to be
any improvement on established practice” (1929, 77-78). Even if most of the plans fail, the spirit of experimentation originality itself is valuable.

It was important to Mill that these experiments not be shallow attempts, but something deeply rooted and diligently pursued. This is where he uses the metaphor of growing and cultivating—the metaphor of the garden. He compares people to trees, and says that each person needs the proper soil and the “air of freedom” so that each has the space “to grow and develop itself on all sides .... ” He carries on the metaphor, saying that many believe humans need to be carefully constrained, “just as many have thought that trees are a much finer thing when clipped into pollards, or cut out into figures of animals, than as nature made them” (1929, 75). Politics should not be a topiary or a row of lollipop trees, but something that more closely resembles a cottage garden. In a cottage garden, there is a great diversity of plants connected by boundaries such as paths and fences. The plants grow into new spaces and often self-sow, so the garden changes not only from season to season but also from year to year.

Mill wanted these experiments to be so deeply rooted that he thought the most important of all political freedoms was the right to develop new approaches to the education of children. It is a useful reminder that political experiments, if they are to be fruitful, cannot be shallow efforts and should not be subject to fad – but rather must be carefully developed and pursued, and that their largest effects are likely to be on others rather than ourselves. It is this combination of deliberate, careful, and dedicated cultivation coexisting with the possibility of failure and a willingness to adjust or start anew that makes gardening a useful way to think about politics. One of the boys educated by Plato in his garden was a young Aristotle, who grew up to teach in a garden of his own. There he rejected aspects of his teacher’s idealism, and spoke of a golden mean to be discovered between extremes in all aspects of life. The garden as political metaphor might help us find a useful middle ground, and to cultivate it fruitfully.
Community Gardening and Grassroots Politics in the Neoliberal City
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1. Introduction
When community garden activists of the 1970s and early 1980s clandestinely planted tomatoes, cucumber and sunflowers in abandoned backyards and on run-down lots, they probably never imagined that a time would come when city administrations would embrace urban gardening as an important “cultural, ecological and social resource”. Many of today’s community gardens in North America and Europe started out as squats or informal “guerilla style” gardens and were influenced by, if not a substantial part of urban social and environmental movements of the 1960s and 1970s. The gardens were often located in some of the most neglected areas of the city and many of them went through intense phases of political struggle and negotiation before they were able to obtain permanent legal status.

Today, many cities recognize the great value of community gardens and create programs to protect and support them.
Urban gardeners themselves have founded strong local and national organizations and international networks to exchange information and experiences, organize public events, and lobby for more and better urban gardens. In summer 2008, for example, Slow Food Nation, Victory Gardens 2008+, Garden for the Environment, and several other groups and organizations – supported by the City of San Francisco – created a huge organic garden in front of San Francisco City Hall. Over several months, the public garden in the heart of the city promoted local gardening organizations and brought issues of urban ecology and sustainability quite literally and physically to the center of public attention.

On one hand, the successful institutionalization of community gardens that safeguards them in times of rapid and market driven urbanization is a great success. Today, most metropolises have more urban gardens than 20 or 30
years ago, and they do a better job protecting them. On the other hand, the incorporation of community gardens – and of organizations that maintain and promote them – into the urban political system often comes at a price: the loss of a vision for a radically different city. Local administrations don’t necessarily appreciate community gardens for being autonomous and highly politicized spaces, but for their ecological and recreational side. For the political establishment, community gardens are not “good” because of the radical dynamics they might unfold. They are desirable and deserve support, because they produce healthy food, social cohesion, and patches of green in an otherwise dramatically anti-social and unsustainable urban environment. Garden activists, in turn, can hardly abandon the (legal) security and (material) resources public agencies provide – although their social, political and ecological values might put them into direct opposition to their local governments.

This is not to say that all community gardens have necessarily been coopted, or that political activism should always take the form of militant confrontation with state authorities. On the contrary: Many urban gardens are important spaces of counterculture and resistance to the logic of capitalist urbanization. And they make good use of public resources by channeling them into green communal spaces. The project that led to the publication of this book, Beneath the Pavement: A Garden, is but one example of how communal gardening can facilitate critical reflection and political action. However, today’s community garden activists have to maneuver in a difficult political terrain marked by urban growth policies, environmental and social depredation, and the politics of neoliberal co-option. This essay is an attempt to examine this terrain, to take a closer look at some of the political forces that shape it, and to discuss possible strategies for countering neoliberal urbanism.

2. Neoliberal Urban Politics
The political tensions and contradictions that community gardeners have to deal with today must be understood against the backdrop of neoliberal urban politics that started in the early 1980s.
Over the past 30 years, national governments have consistently cut back their funding for cities. Nowhere is this more apparent than in the US, where “Reagan cut federal assistance to local governments by 60 percent. In 1980, federal dollars accounted for 22 percent of big-city budgets, but when he left office, it was down to 6 percent” (Dreier, 2004). Additional fiscal stress stems from the liberalization of trade and investment that puts cities and regions nationally and internationally into direct competition. Deindustrialization and structural unemployment add to the picture. Since the 1980s, these trends have further continued and have resulted in a kind of urban Darwinism.

In order to deal with the situation and generate much needed revenues, cities have come up with new entrepreneurial strategies. According to David Harvey, “traditional local boosterism is integrated with the use of local governmental powers to try and attract external sources of funding, new direct investment, or new employment sources” (1989, 7). In this context, we can identify three interrelated trends:

1) Local governments develop their own economic policies. They try to attract new investors and actively fund large commercial developments and global events like Olympic Games, international conventions and art biennials. Tax giveaways are handed out to big companies, public enterprises are being privatized and the public sector downsized. Image-politics and city branding take on a high priority as cities advertise their “uniqueness” and attractive values such as “innovation”, “creativity” and “success”.

2) Economic policies take priority over social policies. Local budgets for public housing, culture, education, and health care are shrinking, while mega-projects such as convention centers, sport stadiums and high-end research facilities often receive generous funding.

3) Within this process, the local political arena is being opened up to new actors. Neighborhood groups, nonprofit organizations, consulting firms and other private and semi-public entities are actively integrated into local politics – often in the form of round-tables and public-private partnership. However, the new opportunities to participate in city politics, ranging from urban planning procedures to publicly funded social services, also increase the pressure of “realpolitik” on the so-called “third sector”. (Mayer, 1994)
It is the latter point that makes neoliberalism often a difficult thing to deal with for leftists – precisely because the neoliberal agenda is much more than just economic exploitation plus state repression. No illusions here: Neoliberalism has destroyed – or at least significantly weakened - many institutions, agencies and organizations of the left. And radical grassroots activism often faces open persecution. But neoliberalism has also attacked the bureaucratic and paternalistic structures of the old welfare state and offers new opportunities to actively participate in politics, especially on the local level. It has been building its own (counter-)institutions and it has successfully incorporated civil-society organizations into the political machinery (Mayer, 2003). In Germany, for example, the federal program “Soziale Stadt” (Social City) aims at including and activating citizens in marginalized quarters. And Tony Blair’s “New Deal for Communities” supports numerous community led projects in deprived neighborhoods.

Real political power, however, remains centralized in governments. All too often, participatory programs like “Soziale Stadt” merely put a small local bandage on the deep wounds that neoliberal macro-policies have inflicted on working class and immigrant communities. The politics of integration and activation follow a twofold logic: on one hand, civil society organizations, foundations, private agencies, and individual volunteers regenerate their neighborhoods and deliver social services at low or even no costs for the state. On the other hand, citizen participation creates social cohesion and feelings of community and belonging – things that individualism, competition and urban Darwinism can hardly produce, but that are indispensable requirements for political stability and domination over time. With this in mind, we now turn back to the question of grassroots politics and urban gardening in the neoliberal city.

3. Community Gardening between Utopia, Resistance and Cooption

Writer and activist Chris Carlsson has emphasized the utopian moment of community gardening. In his book *Nowtopia* he argues that the “new politics of work” – work outside the capitalist logic of private property, monetary value and
wage labor – provide people with the experience of “(re-) appropriating their time and technological know-how from the market” (Carlsson, 2008, 3). Through collective and autonomous action a new type of class struggle is being invented that neither depends on fetishized ideas of “good labor” nor does it rely on hierarchical institutions like political parties and trade unions. Along with projects like bicycle kitchens, community centers, and open source networks, community gardens “have become battlegrounds for opposing social dynamics ...” They provide space for “unregulated social interaction” and they are “important arenas for multi-generational circuits of communication, memory, and experience” (Carlsson, 2008, 81-83).

Whether as a site of open political protest or as a space of subversive everyday practices, community gardens play an important role in nurturing utopias and resistance.

The recent conflict over the South Central Farm in Los Angeles is a prime example of urban gardeners’ commitment to social and environmental justice (Lebuhn, 2006). With its 14 acre size, the South Central Farm was probably the largest community garden in the United States, located right on the border between the district of South Central, L.A., and the city of Vernon. Since 1992, about 300 working class families, mostly migrants from Mexico and other Latin American countries, had been farming the land. The farmers could easily cover about one third of their food needs through the gardens. On weekends, neighbors and friends stopped by to trade, sell and give away fruits, vegetables and herbs. Besides being an important factor of support for low-income households, the garden also became a fascinating microcosm of Latin American biodiversity, and for many of the Latino farmers it provided a place of cultural identity, a home, and a source of collective memory in the heart of L.A. When in 2002 the City decided to sell the land to a private investor, hundreds, if not thousands of neighbors and activists, dozens of grassroots groups and celebrities like Daryl Hannah and Joan Baez joined the South Central Farmers in their attempt to save the gardens. For an entire year, farmers and activists occupied the gardens around the clock to protest the imminent eviction. Although

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Photo: Anthony Applesauce
they eventually lost the struggle over the South Central Farm, the conflict became a powerful experience: it shows how community gardens can unfold an unpredictable political dynamic, bring together residents and neighbors from diverse backgrounds, mobilize them along issues of social inequality and urban sustainability, and challenge the politics of private enclosure and urban growth.

If community gardens are not explicitly politicized, however, they can be easily integrated into the neoliberal regime and function as some kind of social buffer in times of anti-social urbanism. In her essay on “Green Space Governance”, Marit Rosol examines several cases of recently started community garden projects in Berlin that receive support and funding from local authorities, but lack the tradition of social movement activism. A series of interviews with urban planners and politicians reveals why local authorities promote these gardens and see them as great assets of their districts:

First – and not surprising – their support and call for voluntary engagement for public spaces results from severe cuts in public spending ... Voluntarism is seen as a means of dealing with this problem. ... Secondly, they hope for an improved appearance of the neighborhood. It should look clean, pretty and secure. ... Finally, the planners and state administrators argue politically for a stimulation of civic engagement, community responsibility and social capital in order to ‘stabilize the neighborhood’. (Rosol, 2010)8

Nikolas Rose has coined the expression “governing through community” in order to describe how neoliberalism draws its precarious legitimacy from participatory practices, and how the regime is able to occupy and instrumentalize the time and creative energy citizens put towards collective projects (1996).9

In the case of community gardens, we also need to keep in mind that they often contribute to increasing property values and cater to processes of gentrification. Incorporation and co-option are not inevitable, however, as we can see in cases like the South Central Farm, Beneath the Pavement and many others that are involved in less spectacular but equally important forms of grassroots activism. In the last section of this essay I will therefore attempt to garner some ideas for counter strategies and radical green resistance to neoliberal urbanism.
4. “How to…” (Not) a guide to radical garden politics under Neoliberalism

The following list is by no means meant to be a comprehensive guide to grassroots gardening in the neoliberal city. But instead of finishing this essay with a summary or theoretical conclusion, I would like to invite readers to think about the practical implications of this analysis and to continue and extend the discussion presented on these pages. I will end then with five (simple and preliminary) suggestions for resisting neoliberal co-option of community gardens:

1) Keep community gardens inclusive and foster internal democratic structures. Important elements are broad participation in decision-making procedures (instead of hierarchical administrative structures) and a culture of discussion and consensus orientation (rather than majority vote). The community garden’s “internal affairs” can become a real counterculture to the disempowering experience of an elite-led representative democracy.

2) Share knowledge, seeds, and space. Resist the trend to material and intellectual enclosure. Invite friends, family and neighbors to share the experience of collective gardening.

3) Make (local and other) politics an everyday issue. Community gardening organically relates to many other issues such as land use, environmental pollution, privatization, rental market and real estate speculation, gentrification, education, etc. Turn gardens into public spaces of vivid debate and mutual exchange of thoughts and ideas.

4) Promote activism. Your fellow gardeners can become your political network as well. Collectively, you can support other community gardens and/or local political groups, either by actively supporting their actions and campaigns, or simply by inviting them to use your garden as a space for gatherings.

5) Secure your garden against the threat of privatization and development. Many gardens are operating based on so-called “interim use” of public land or on privately owned properties. Permits can be revoked, even after many years. Securing community gardens’ permanent legal status as commons, and extending the non-commercial and public use of urban land should be on top of the list.

Additional Resources:
Farming is a recent activity in the history of the human race. Our species separated from chimpanzees more than six million years ago, and the people of 200,000 years ago were little different in appearance from the people of today. The population was tiny, with perhaps 10,000 people, and all were hunter-gatherers, spending most of their time catching or collecting food, and not having the ability to store or transport amounts that would be useful to maintain them through famines, or even from one year to the next. The period about 10,000 years ago, at the end of the geological Pleistocene epoch and the Paleolithic stone-age was marked by a period of global transition. The changes experienced included alterations in the climate as the last glaciations finished, the extinction of many larger animal species, and appearance of different forms of vegetation cover with open woodlands being replaced by forests or grasslands.

This period was also marked by the people changing their lifestyle from hunter-gatherer to farming, with the new activity emerging at different places throughout the world over a
relatively short period: Southeast Asia, China, the Middle East and Southern Europe, and Central America (Fig. 1). Why should these separate groups of people have adopted the new lifestyle, involving changes to diet, new governance to organize planting, harvest and storage of crops, and new roles for the men, women and children? Many of the possibilities sound remarkably similar to the challenges faced by humans today: over-exploitation of wild species, climate change, habitat destruction, increasing populations needing more resources, and perhaps the desire to spend less time working to win food.

It is remarkable that all the major crops and animals that we eat today were domesticated right at the dawn of the agriculture – the cereals including wheat, rice, barley, maize, the peas and beans, root crops and fruits, as well as sheep, pigs and cows. Then, as now, fewer than twenty crop plants produced the vast majority of all the food eaten by people. About 60% of the calories we eat have always come from seeds (Fig 2), the part of the plant which could be collected, stored and propagated most easily, although there is no ‘rule’ as to which part of a plant is the storage structure and chosen

Fig. 1 Farming as practised for thousands of years. Here, teff (Eragrostis tef) is being planted following a bullock plough. Both the crop and the animal are similar to those first domesticated.
for cultivation. Different parts of the seed are eaten in peas and cereals, while fruits are very diverse, and other crops are grown for their tubers, roots, leaves or even stems (Fig. 3).

The crops planted and harvested by people right from the start differed from their wild relatives by a group of characters known as the “domestication syndrome”. This group of characters makes the crop largely dependent on humans for reproduction and growth, but at the same time makes its planting, cultivation and harvest productive and worthwhile. The characters include lack of seed dispersal (so seeds stay attached together and to the plant), seeds which freely germinated when planted, larger seeds, fruits or roots that are harvested (also called gigantism), often combined with less production of non-edible parts of the plant.

Archaeological finds give us a good impression of these early crops. Over the subsequent millennia, the crops of this early period have been improved, but no major new crops have been introduced. By the middle ages, there are books showing the appearance of crops at these early periods (Fig. 4).

Where is agriculture today? In the last 50 years, the global population has increased from 3 billion to 6.9 billion, a 2.3-fold change. In the same period, the production of crops has seen an increase of 2.9 times. This has meant better nutrition on average, with the number of seriously
undernourished people changing remarkably little and declining in Asia and South America. However, the number of overnourished and fat people has shown a large increase in the period, accompanied by changes in diet. As well as the increased consumption of meat, milk and eggs (with the animals eating some of the increase in production), plants grown for cooking oils, fats and margarines have shown fivefold increase in production in the period.

Another important social change was seen for the first time in 2008, when more than 50% of the world’s population became urban, buying food that was transported from the countryside from a declining proportion of farmers or agricultural labourers.

As in any industry, it is important for food production not to lead to wastage, and postharvest loss is still a major challenge. In many parts of the world, as much as half of the food that is harvested is not eaten, whether it rots (Fig. 5) or is destroyed by insects or rats. All the resources and time for land preparation, watering, fertilizing, harvesting and packaging

Fig. 3 A market showing the diverse parts of plants that are eaten including leaves, stems, fruits, roots, tubers, bulbs and seeds.
have been put into the crop at this stage. As well as the challenges from needing to produce more food, there are also environmental challenges associated with its production.

While farmers have in general been good stewards of the land, some practices have been unsustainable, including use of more land, overproduction and weed control allowing erosion (Fig. 6), use of heavy metal fungicides and in much of the world exploitation of water or irrigation. As discussed above, domestication happened 10,000 years ago, but many additional changes in our crops have been seen in less than a lifetime: it is now rare to find table grapes with seeds, eggplants or aubergines no longer need covering with salt for a day to remove bitter tastes before cooking, sweet and red grapefruit don’t need sugar. The needs from consumers for more food that is safer, tastier and more nutritious will continue to increase; while farmers will look for plants which grow healthily and easily, while giving high and predictable yields with low inputs from fertilizers, crop protection chemicals and water. Growing the large amounts of food needed by the increasing population will always have a major impact on the diversity, and replace wild plants with cultivated crops, but this can be minimized. The diversity of genes present within crops, their wild relatives and more remote species can be used systematically for breeding of new varieties, continuing the selection and improvement carried out by mankind since the origins of agriculture (Fig. 7).
Fig. 5 Wastage of food: a problem facing many countries. After all the effort, land, and costs from ploughing, watering, harvesting and packaging, wastage of food before it can be eaten has huge economic and environmental costs.
Fig. 6 Environmental degradation from the middle ages. Many parts of the limestone pavements of the Burren area in Ireland were covered by soil and forests thousands of years ago. Exploitation over hundreds of years for fuel and feeding animals has eroded the area back to the underlying rock. Now though, the rare rock forms are important habitats for many plants and they are being carefully maintained.
Fig. 7 The diversity within a crop. There is enormous variation in many crops, seen here in bananas and plantains, where in the West we can only find the single banana variety Cavendish. The diversity extends beyond colour, size and flavour, and these varieties also differ in their resistance to disease, yields and efficiency of water usage. The range of diversity within crops and their wild relatives can be exploited for making new and improved crop varieties.
Assembly
(Beneath the Pavement: A Garden)
Agency
Since the 1970s, the lot 509-515 East 11th Street between Avenues A and B located on the Lower East Side of New York City was vacant. The lot was owned by New York City after the property was seized from private landlords for back taxes.

In 1991, sculptor Ken Hiratsuka and painter Chico started the garden entitled *Chico Mendez Mural Garden* at the lot 509-515 East 11th Street. The garden was named after Amazon Rain forest environmental activist Chico Mendez, who was murdered by loggers in 1988. Together with the artists Ron English, Leslie Heathcote, Lauridsen and over forty neighbors like Nelson Rodriguez and Jeff Wright they planted trees, vegetables, flowers, etc... on the lot. The garden grew without city support in the Lower East Side neighborhood. The *Chico Mendez Mural Garden* contained also a series of painted murals and sculptures. One mural, on the wall of a city-owned building on the west side of the garden, was an anti-smoking mural painted by Farinacci in 1992 as part of the city’s anti-smoking campaign. Aside was *In Memory of Anthony of Ave D* painted by Chico and *Car crash*. The other three murals are painted on the building Heathcote, Lauridsen and Garcia lived in located on the east side of the garden: Leslie Heathcote’s *Ocean* mural and Ron English’s mural dedicated to Chico Mendez himself and Lauridsen’s *Good Against Evil*. The building provided affordable housing for artists. Except the mural by Farinacci, all murals were painted without the city’s permission. One of the sculptures was *the continuous line pathway sculpture*. The artists considered the garden as a whole to be a work of art and described it as “a large environmental sculpture encompassing the entire site and comprised of thematically interrelated paintings, murals, and individual sculptures of concrete, stone, wood and metal, and plants” (1997). It was widely utilized by people in the neighborhood and became an important meeting place.

Since 1994, Mayor Rudolph Giuliani’s Administration intended to sell off all so called vacant city-owned properties. This was part of the city’s supposedly affordable housing program. The Department of Housing Preservation and Development (HPD)
placed over half of the 776 community gardens throughout New York City “on hold” because of pending development plans. Antonio Pagan, the Lower East Side city councilman and founder of the Lower East Side Coalition Housing Development, the non-profit housing group, was in charge of the sale of city-owned property at the Lower East Side.

In September 1995, New York City sold the lot at East 11th Street for $2.3 million to the NYC Partnership Housing Development Fund, a large consortium of banks, financial and real estate interests that was at the time the leading developer of new housing on city-owned land.

In March 1996, the development of the lot was approved by Community Board 3.

On May 14, 1997, also the New York City Council, including council members Tom Duane, Sal Albanese and Virginia Fields, voted Resolution 2350 and approved the development.

The development rights for the site were handed to Donald Capoccia of BFC Partners, who had contributed $10,000 to Giuliani’s mayoral campaign. BFC Partners signed a Site Development Agreement with the NYC Partnership Housing Development Fund and entered into a Building Loan Agreement to obtain some $13 million to finance the construction of private condominiums, ranging in price from $117,200 to $201,000. The construction of condominiums implied the destruction of the community garden Chico Mendez Mural Garden.

An uproar and protest by the garden supporters followed the decision for destruction. On September 15, 1997, the New York City Coalition for the Preservation of Gardens, representing hundreds of community gardens, brought suit in state court seeking to block the development at this site and also other sites. On October 1st, 1997, a claiming order to vacate the community garden had been issued. Police backed off after garden supporters mobilized to defend the garden, saying they did not have a copy of vacate order in hand. A temporary restraining order was entered in the State court action.
On October 7 1997, six artists, including Ron English, filed action against BFC Partners based on the Visual Artists' Rights Act ("VARA"). The artists claimed that each of their rights will be violated if construction proceeds and the garden is destroyed.

On October 15 1997, the temporary restraining order expired when Justice Atlas dismissed the petition concluding that petitioners lacked standing to challenge the appropriateness of the land use determinations made by the City of New York with respect to the Lot. Then an appeal made the order pending. On November 7 1997, the temporary restraining order expired. On December 2 1997, garden supporters assembled a barricade of construction cones, police barriers and garbage against the garden fence, around what they called Fort Chico Mendez.

On December 3 1997, the case Ron English and others v. BFC & R and others took place at the United States District Court, S.D. New York. Judge Baer stated:

_The debate over the merits of the litigation turns in part on whether the Garden is conceived of as a single work of Visual Art, or whether each mural and sculpture is seen as an independent work. This distinction is critical because there is no dispute that the sculptures and elements of the garden can be removed before construction begins. Indeed, defendants have agreed to do so and to deliver them to another nearby resting place at no charge to plaintiffs. Although construction will obstruct the view of the murals, they will not be physically destroyed or mutilated. ... Defendants move for summary judgment on various grounds, including their assertion that VARA is inapplicable to plaintiffs’ artwork because it was illegally placed on the property. I find this argument convincing and hold that VARA is inapplicable to artwork that is illegally placed on the property of others, without their consent, when such artwork cannot be removed from the site in question. In light of this holding, I need not reach defendants’ constitutional challenges to the application of the statute. It is this same legal principle that led me to deny the motion for a preliminary injunction. ... moral rights statute applied only to art that is affixed or attached by arrangement with the owner. It obviously does not apply to graffiti, which lacks these characteristics. ... otherwise parties could effectively freeze development of vacant lots by placing artwork there without permission. Such a construction of the statute would be constitutionally troubling... The Court therefore holds that VARA does not apply to artwork that is illegally placed on the property._
of others, without their consent, when such artwork cannot be removed from the site in question. ... What is clear is that plaintiffs cannot claim a protectable interest in the Garden itself— even were it deemed to be a single unified work of art— because it was illegally placed on City property and, plaintiffs argue, cannot be removed as a whole. Because plaintiffs have failed to raise a genuine issue of fact as to any license or permission to place the artwork on the property, and in light of the Court’s holding that VARA is inapplicable to such illegally placed works, summary judgment is appropriate.

The Court concluded that Chico Mendez Mural Garden is not copyrightable and that therefore the garden could be destroyed.

On December 31, 1997, contractors employed by real estate developer Donald Capoccia bulldozed Chico Mendez Mural Garden. A few days after that, a curse was placed on the lot.

With thanks to the Chico Mendez Mural Garden Archive of Jeffrey Cyphers Wright, Lisa Darms The Fales Library and Special Collections and Bill Not Bored.
THIS SPOT IS
HEREBY CURSED.
FOREVER

Specimen
Imagine a giant sponge floating in a clear cool pool of water filled with sand and stone. This is home. Between the soggy ceiling of the ground water aquifer and the upermost interface of earth and air is a spongy space of soil particles and pores invisible to most surface dwellers - the vadose zone. It percolates and grumbles, teeming with more species in a single spade full than all the living creatures on earth. Fear of the dark, of eyeless wriggling creatures, of lurking toxins, and of buried past casts a long shadow on the wonders of the pedosphere. The soil is for corpses and farmers. For people not immediately engaged with questions of life and death, the giant sponge’s sole purpose is to provide space for grand structures, concrete foundations, and public mains. In cities, the vadose zone is systematically frozen in time beneath buildings and sidewalks, and contaminated with all kinds and concentrations of pollutants. It is a place of fact and folklore, a complicated amalgam of natural and “non-natural” substances, communities of weird and wonderful flora and fauna, and rainwater filtering through tiny labyrinthine pores. Enter your basement and imagine the earthworms, mice and springtails on the other
side of the wall. You are dry and safe in your own private super-macropore. Start digging a hole toward the other side of the planet. What will await you? That fabled underground swimming pool, or only saturated sand that blocks your passage to China? Shovels full of progress just fill up again in vain. Maybe try pumping out all that water to add a new soil-deck under the basement. From there the softly shifting stones and whispering water of the phreatic symphony can be better heard. Vadosian Movement #1.

What kind of an ecosystem do the cracks in the pavement offer? What kind of interspecies social space is a sidewalk? What does the mobility of humans mean for the mobility of flora, fauna, water, and the inorganic particles carried along the way? In the following we address contemporary questions of the vadose zone and introduce several concepts on the properties and dynamics of urban soils, as well a few public outreach and art projects, which attempt to generate greater understanding and appreciation of the landscape beneath the city’s surface. We invite you to walk with us in this magical space below the city, to listen with new understanding to the pulsing underground of the vadose zone.

We’ll introduce three aspects of urban pedology (the science of city soils), in the context of cultural and socio-political speculation: technogenic substrates, roadside soils, as well as the hydrological phenomena of both. These are juxtaposed with artistic responses in what could be considered acts of creative conservation. In addition to a few of our favorite “best-case scenarios”, we also present results of our own cross-disciplinary sci-art experimentation. Finally, many of the scientific ideas referred to in this chapter are based on ongoing research projects in the Department of Soil Protection at the Technische Universität Berlin, which will be presented in detail in the book chapter, Urban Soils in the Vadose Zone (Wessolek et al 2011 forthcoming). In this re-telling of the vadose tale, we kindly acknowledge our co-authors of that chapter, Björn Kluge, Thomas Nehls, Eva Klingelmann, Yong Nam Rim, Beate Mekiffer, and Steffen Trinks, for their input and encouragement of a rather philosophical contextualization of their work.
1. From Brick to Fill – Soil Memory and the Sensitivity of Sidewalks

Along Berlin’s older residential streets, especially in the eastern boroughs, sidewalk sensitivity is announced with bold signage. Where the pavement buckles from frost swells or root penetration, it is common to see the following sign: “Achtung – Gehwegschaden” (Attention – Sidewalk Damage). A mixture of municipal gentility and bureaucratic necessity to avoid the liability claims of clumsy pedestrians, this sign gestures a hint of mystery, like a static traffic authority at the scene of a crime. What is under there anyway?

Dirt

Peel back the pavement and what do we find? Dirt, sand, stones, debris, roots, worms, turds – in short urban soil. Distinguished from agricultural and natural soils, soils in the city are characterized by a range of anthropogenic factors such as the presence of human artifacts and contaminants, alkaline pH, high black carbon content, high bulk density, low soil moisture, warmer soil temperatures, and a relatively young stage of pedogenetic (soil building) development. Physical disturbances, such as compaction, sealing or the dumping of foreign materials are also a sure sign that you’re in the city. The more we dare to look beneath the surface, to uncover the truth about the origins and properties of urban soils, the more we uncover remnants of the past.

This in turn can inform future land-use management decisions.

An investigative archeological approach can be applied to the literal chemistry of the street. Contamination in older, densely populated neighborhoods, for example, is often a relic of unregulated waste management from times past. Specific contaminants of bygone generations might include combustion residues of heating processes, expired building materials and other refuse that was disposed of - in, on, and throughout - the surrounding soils. Waste materials associated with certain manufacturing and production processes also accumulate on
industrial and commercial sites through leakage and accident (Blume & Schleuss, 1997), archiving the traces of industrial achievement in the grainy memory of the soil.

In terms of short-term memory, we may first inspect “Gehwegschäden” in more detail. First shreds of evidence may be scratched away from the seams, or the scant crust between curbstones and frost cracks. The term “seam material” describes the sandy fill used between and under the pavestones of sidewalks. Seams are the soil of the sidewalk.

Within the confines of such tiny spaces, cracks in the pavement offer a curious ecological micro-niche.

Pioneer mosses and other extremophiles, like early settlers, are the first to claim this barren territory, initiating soil formation processes in the most overlooked corners of the urban landscape. Despite their small scale, seams take on important soil functions, such as filtering, buffering and groundwater recharge in urban areas with high degrees of sealing (Wessolek, 2008). By “sealing” we mean the covering and paving of soils for building and roads.
which can be impervious or pervious, such as this typical seam scenario at the site of a semi-sealed sidewalk in Berlin (Fig. 1).

Over the years, the finger-wide seams develop into a brownish black mixture of dirt and dust. Oozing its way into the sandy fill is an accumulation of decomposed leaf litter, rotting foodstuff, excrement, oil, hair, cigarette stubs, plastic packaging, and glass shards – in short, any kind of urban waste that is small enough to lodge in the cracks in the pavement after being pulverized by passing pedestrians and vehicles. Atmospheric emissions and ground up waste together constitute what is known as “urban dust.” This mystery mixture is an unintentional consequence of so-called pavement-milling. Take a look at the soles of your shoes and the condition of your tires and imagine where the crisp factory-fresh edges have gone to. Not to the land of lost buttons and socks. The residue of all street side abrasion is sent straight into the seams and mixed with rainwater, which together seek out the easiest path to the vadose zone.

As insignificantly small as they may appear, seams are often the only infiltration pathways on partly sealed pavements. In many ways, they connect the aboveground world to the groundwater and the watershed beyond – literally seaming two environments together.

Not only do seams allow infiltration and reduce evaporation, they can contribute to groundwater recharge that is vital to the urban hydrologic cycle.

Wessolek & Renger (1998)\(^3\) discovered that groundwater recharge rates in Berlin could be more than double that of a nearby pine-oak forest. Depending on the amount of total semi-sealing and seams present, up to 100 to 200 mm/a−1 could be infiltrated on a city sidewalk, compared to only 80 mm/a−1 for the outlying sandy pine forest.

As gateway to the vadose zone, seams also play an important role in the sorption processes of pollutants. The gradual accumulation of dust and debris in the upper seam results in a different physical composition compared to the lower layers of seam material (Nehls et al., 2006). Compared to the original sandy fill, the altered material has significantly higher soil organic carbon (Corg) and consequently higher water storage capacity. Though the sorption capacity of seam material is less pronounced compared to natural humic substances, sidewalk seams are nevertheless a valuable filter. Even after 50 years of heavy metal input by traffic emissions and urban dust, most of the trace elements are still bound in the first few centimeters of the topsoil (Nehls et al., 2008). It is a little shocking to imagine that rainwater being filtered through some grimy cracks in the sidewalk is destined for the groundwater. Yet, the natural infiltration processes of seam soils also clean the percolation water and play an important role in protecting groundwater. Knowing this, we can learn to appreciate that even urban dust and dirt have a filtering and buffering function. In a sense we can say that dirt cleans dirt.

Rubble
When the last smoke of World War II cleared in May of 1945, much of Europe lay buried in rubble. Approximately 400 million m³ of debris was left in the wake of World War II in Germany alone (Blaum-Jordan, 1947). In the nation’s de-politicized capital, it was only too soon that neighborhoods could be rebuilt and parks replanted, transforming the traces of approximately 75 million m³ of debris deposited throughout in the city. That the memory of the soil is physically linked to the memory of a society is a condition that has been historically subverted.

We build strip malls and gas stations on the soils of our grandmothers’ playgrounds.

New wars or urban planning will reduce those malls to rubble too one day, adding another layer of strata to the soil psyche. In

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fact, one of the most common technogenic traces in the urban underground is rubble (Fig 2). Rubble is a general term used to describe debris from different types of building materials, which were constructed and demolished in different ways at different times. Rubble is the stuff of ages, found hidden beneath streets and sidewalks, parks, gardens, and plazas worldwide. The sorting, disposal, and re-use of rubble materials also differ from place to place and generation to generation. In general, four groups of materials may be distinguished:

- Bricks and mortar  
- Metals, ceramics, glass, bitumen  
- Leather, slate, marble, limestone fragments  
- Carbon, organic carbon of the fine earth fraction, inorganic carbon of the coarse fraction

Like gaps in global consciousness, rubble soils are filled with air waiting to be filled with new life. These soils are extremely well aerated and drain rapidly. They have a shallow to sometimes very deep root system, depending on the size, depth and compaction of bricks and stones in the subsoil. Deep-rooted plants and trees, such as the black locust, mostly have a sufficient water supply, while plants with shallow roots can sometimes suffer from water shortages. Furthermore, the origin and manufacturing process of technogenic parent materials plays an important role in the water holding capacity of rubble soils. While conventional loam bricks, for example, have a relatively high water capacity of more than 25% of the total brick volume, industrial clay or loam bricks have less than 20%. This may be explained by higher burning temperatures during the manufacturing of industrial bricks, or the second “firing” that many bricks received during war time bombing. Despite an advantageous water holding capacity, it is generally thought that roots are too large to enter the tiny pore spaces of bricks. However, upon closer inspection one can recognize a dense coat of thirsty root hairs clinging to the surfaces of bricks and other rubble components.

It is no small feat that wild urban woodlands (see Kowarik, 2005) and ruderal meadows have blossomed on rubble soils. Depending on the amount, depth, compaction, particle size, and type of parent material, rubble can actually have positive effects

on the water and nutrient supply for plants. In rubble soils in Berlin, the total available potassium and phosphorus are higher than levels in pure sandy soils elsewhere in the city, while nitrogen in the root zone is comparable to agricultural sites in Berlin and Brandenburg (Blume & Runge, 1978). The favorable nitrification conditions are often due to N-uptake of soil bacteria nodules in rhizobium symbiosis with the wild-growing black locust trees (Robinia pseudoacacia). Additional nitrogen inputs from atmospheric pollution and animal excrement make the urban pedosphere a relatively lush place to live. With so many nutrients in the system, no fertilization is necessary. From barren heaps of broken bricks, emerge wild jungles of box elder, black locust and tree of heaven. Calandine and nettles sprout from sidewalk paths and traveller's joy covers entire backyards, obscuring the very substance of rubble as well as the memory of its origin.

Historical tragedy and political amnesia aside, the nature of rubble has a fundamental effect on the physical, chemical and biological properties of the soil, contributing to the amount and availability of nutrients and heavy metals as well as the water quality. What is largely unknown is that sulphate concentrations have been steadily increasing over the last 40 years, especially where larger deposits of rubble lay buried (Pekdeger et al., 1997). After years of healing and cultural reflection, a steady release of sulfur trickles from the crumbling mortar, ashes, and coal buried in mountainous memorials that still dot the landscape of Berlin and cities across Europe. The aggressive acids of high sulfate concentrations in the groundwater affect the taste and quality of drinking water, and enhance the process of oxidation, which leads to corrosion of infrastructures. In generations to come, research on long-term sulphate desorption will be essential to help predict sulphate transport in the groundwater and combat contamination in the vadose zone. 65 years onwards, the soil lets no one forget (Fig 2).


Moisture Banking

What makes the vadose zone so special is that it is a place of three-phase existence – a place where solid, liquid and gaseous forms and processes intermingle. While the uppermost layer of topsoil is a rich medium teeming with life, its lowermost edge hangs over a wet fringe of interwoven capillaries that suck up the ground water into pore spaces like millions of tiny cocktail straws dipped into the life-spring below. The rise of water against the force of gravity in the intricate capillary fringe is determined by the size of the pore spaces. These are determined by the size of the soil particles, which in turn are determined by the age and origin of parent materials present in the subsoil. A gravelly glacial sand, for example, makes for a coarser fringe than an aeolic loess, sticky clay or muddy peat. As a rule of thumb, the smaller the pore space, the higher the capillary rise. Depending on the girth of the vadose zone, from just a few centimeters to many meters thick depending on the topography of the landscape and the depth of the groundwater, the capillary fringe can be a daily reality, such as for soils on floodplains, or a distant memory, such as for soils on semi-arid plains. In many ways, the vadose zone is a kind of moisture bank for all life on earth – a place where precious water is deposited, stored, and slowly processed into the groundwater aquifer.

Looking back through the ages, it is interesting to consider that soils occurring in favorable locations with the best arable soils have been more frequently and thoroughly built up than the oligotrophic lands of rock and sand (e.g. regosols, podzols) or the humid environments of moors and fens (Blume, 1992). Wide river valleys and marshes with alluvial soils and fertile loess lands with rich loamy luvisols were the first landscapes to be settled and paved. Where meandering waterways once cut through fertile valleys, meandering roadways now course through artificial canyons of streets and buildings. Given this irreversible trajectory of human settlement patterns, groundwater protection and flood relief can now only be countered with ecosystems-oriented planning and the “metrofitting” (Fry, 2009) of cities on former floodplains. This ranges from reinterpreting zoning laws, to wetland mitigation and wetland creation, to on-site rainwater retention and

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11 Fry, T., 2009. Metrofitting: Adaptation, the City and Impacts of a Coming Climate (with Nora Kinnunen, Petra Perolini and Will Odom Brisbane) Booklet published by Griffith University QCA.
treatment. Architecture and urban planning must also respond to new hydrologic demands in a changing climate. Reducing runoff by increasing infiltration is achieved with small-scale solutions such as: onsite infiltration strips around buildings and along roads, curbside gardens and the use of infiltration-friendly materials, cobblestones, mosaic stones, pervious concrete, and sidewalk pavers with a high degree of seams. The idea is to simply find and implement ways to keep soil water in the local system as long as physically possible.

**Pavement design can play a deciding role in groundwater and flood protection.**

At the moment, pavement systems are generally constructed with retention-weak materials to ensure efficient hydraulic conductivity (rapid penetration of water) of the pavement bed in order to prevent damages from frost or flooding. But this doesn't have to be. “Faulty” pavement construction can also have positive ecological benefits. Retention-strong construction materials (Starke et al., 2010)\(^1\) as well as intentional puddles and “ponding” can have a powerful influence on the urban hydrosphere, contributing to groundwater recharge and surface evaporation. In a recent urban ecology field exercise for landscape planners, students measured the amount of water that could be retained on different paving surfaces. Imitating a summer rain shower with an eyedropper and stopwatch, squares of granite, concrete and wood were tested for their water holding capacity under different rainfall intensities and seasonal temperatures (Wessolek, 2008)\(^2\). The point of the exercise was to show how runoff could be retained and slowly evaporated by better surface design, especially in parking lots and pedestrian zones where sealing is virtually unavoidable.

When finally a thrush swooped down to take a bath in a nearby puddle, the hidden habitat function of construction possibilities became evident. That planning failure was some little bird’s bathtub. Could heartbeats per minute plus brain synapse frequency plus vocalization plus speed of wing movement

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describe the momentary joy of a bird bath? Whether it is pleasure or necessity that attracts birds to puddles, a growing need for ecological planning of pavements is clear. Could we be so thoughtful as to plan puddles in our plazas, sidewalks and parking lots? Would the thrushes thank us? Would the vadose dwellers thank us? It takes great imagination and clarity of vision from norm-weary planners to overlook liability risks in favor of the non-human habitat. In a poor city like Berlin there is still an abundance of Gehwegschäden, rubble piles and moss-clogged mosaic to ensure the prolonged happiness of urban wildlife and wildlife-lovers, at least for another generation.

Creative Responses:

Soil Memory Mapping
In a recent workshop on science and art, initiated by Ping Qui for the Swiss Foundation for the Arts, eight artists and eight scientists and engineers got together to discuss research interests, methods, and the overarching roles of science and art. Our contribution formally referenced ongoing research on sulphate leaching from WWII rubble depositions in Berlin. The workshop provided an opportunity to discuss the relatively unknown implications of sulphate leaching in a cultural context, and to broach the issue of soil memory in a semi-public setting. In a room with an oppressively low ceiling we sketched a map of the city on the floor and covered it with rubble, leaving only the waterways exposed as thin yellow ribbons of connecting matter. We placed 1 meter-tall Plexiglas columns partly filled with rubble on the 13 points of greatest rubble deposition in the city. With a total of 25 million m$^3$ of rubble standing 115 m tall, Teufelsberg, aptly named, was marked with a column filled with the most rubble.

Drawn yellow curtains cast the room in golden glow, like the color of sulphur. In many cultures yellow is also a symbol of hope, loyalty, and new beginnings. The fabric of domestic life, the curtain, contrasted with the ruins of former homes. In the opposite corner, a desk stacked with books, notes, maps, calculations, and other documents was illuminated, representing the research involved in the department’s work on rubble soils. Information about rubble deposition as well as historic maps
and photographs found in the museum hung on the wall behind the desk. One map was a copy of Scharoun’s post war urban plan, which located the man made “moraines” alongside garden colonies and newly cleared green space. Beside this hung a poster-sized black and white photograph of a typical street scene at the turn of the century. For lack of a proper title, we described the installation as “a spatial analysis of WWII rubble deposition in Berlin, under consideration of sulphate leaching, recreational quality and collective memory (Fig. 3).”

**Urban Mining**

Rubble, as one might expect of demolished buildings, contains large amounts of fired brick and mortar. In a city built on sand, the inclusion of once natural materials foreign to the area (e.g. clay, loam and gypsum reformed by manufacturing) creates
an unusual lithographic profile for Berlin’s transformed glacial valley. In a recent publication, such geophysical reshuffling of the earth’s elements in concentrated amounts around urban and industrial areas is introduced as the rise of the astysphere (Norra, 2007). Through the magnitude of human impact on the earth’s atmosphere, lithosphere and biosphere, the anthroposphere is divided into the agrosphere, consisting of vast agricultural lands, and the astysphere home to urban and industrial areas (ibid). In the astysphere scenario, “impacts” may be envisioned as potential resources waiting to be rediscovered.

In the Astyosphere “impact mitigation” might imply the mineral mining of discarded wastes, which lay dormant with golden opportunity in brownfields and backyards.

Limiting future land-use to the already established astysphere presents an innovative approach to preventing further sprawl and at the same time opens up economic development. Landfill mining is already a popular albeit socially and environmentally disreputable practice in many developing countries, but the process of “enhanced landfill mining” and waste management is slowly being refined (Jones et al., 2010). Likewise the reclamation of landfills offers new recreational opportunities for badly needed open public space. While former wastelands gain new value, remaining natural areas may be preserved in their ecospheric integrity.

There is a growing ouvre of art that has exposed and vilified industrial polluters, energy giants, manufacturers, mining companies, and other corporate entities as criminals. Pollution as crimes against the planet is always a painful subject. But considering the unusual mineralogical circumstances of the astysphere, demonizing the physical existence of polluting substances and their creators might be cathartic but
counterproductive. In his Urban Prospecting project, NY based artist Jon Cohrs redefines pollution as cultural and economic opportunity. The urban prospector refits old metal detectors, hydrocarbon sensors and locative media into a conceptual tool that alerts users to buried oil “reserves” leached on superfund sites and abandoned urban brownfields. Referencing the gold-rushes and oil-rushes of centuries past, Cohrs challenges dependence on mineral extraction while exploring their potential reuse in cities. With twitter feeds on latest oil spills around the world, online instructions on how to make your own urban prospecting device, and videos of the object in action (http://urbanprospecting.net), the project merges tech-savvy ingenuity with practical optimism in an age where substance redistribution and redeposition may be no longer mitigatable (Fig. 4).

Permeable Pavements
A by-now obvious solution to rainwater infiltration problems in the city is the use of “intelligent” pavements in non-risk green and residential spaces. In ongoing project, Waterwash™, artist Lillian Ball has been working to rejuvenate degraded wetland sites in Mattituck, Long Island, and the Bronx by using Filterpave™ permeable pavements and native wetland plants. Integrating benches and interpretive signage, Ball’s work is educational, recreational and functional as well as it is aesthetic. With a grant from the National Fish and Wildlife Foundation’s Long Island Sound Futures Fund and construction and maintenance support form the Group for the East End, Ball’s goal as an artist is simply “to get green infrastructure out in the world” (Ball, in an email from 2010). Waterwash™, Ball writes, is “proof that multiple challenges can be solved with integrated functional aesthetics, improving the area both physically and environmentally ...”(Fig. 5).
2. Deer Parking, Seed Stowaways, And Metal Mobility – A Road Trip

\(X\) had marked time in the limestone ledge since the Paleozoic seas covered the land. Time, to an atom locked in a rock, does not pass. The break came when a bur-oak nosed down a crack and began prying and sucking. In the flash of a century the rock decayed, and \(X\) was pulled out and up into the world of living things. He helped build a flower, which became an acorn, which fattened a deer, which fed an Indian, all in a single year … . When the Indian took his leave of the prairie, \(X\) moldered briefly underground, only to embark on a second trip through the bloodstream of the land (Aldo Leopold, 1949, 104).\(^{16}\)

In an era of global ecological tragedy, Aldo Leopold’s brilliant tale of the journey of one nitrogen atom (“\(X\)”) through the natural prairie lands of pre-colonial Wisconsin begs for reflection, and indeed for research.

In the human quest for faster, more efficient mobility, we might consider the mobility of the tiny particles that accompany our journeys along the highways and byways of rural and urban landscapes. What is the fate of “\(X\)” on the freeway, and more importantly, what other molecular commutes take place unknowingly in the anthropocene? By better understanding the journey of “\(X\)” through the metropolis, or Pb, Cd, or Zn for that matter, we may come to appreciate our own interconnected mobility in time to repair, re-plan, and re-cultivate an environment that can accommodate the mobile microcosm, or better yet – to slow down.

Freeways

What good is pavement other than to provide a smooth, frictionless surface for human convenience, progress and pleasure? To resituate Leopold’s tale of molecular mobility, let us take a ride on one of the oldest and most famous paved surfaces in Germany – the AVUS Autobahn in Berlin. Located in the southwestern part of the city, the AVUS was opened to traffic in 1921 and glorified as a triumph of modern technology and symbol of man’s achievement in mobility. From its early days as a race-track, serving less than fifty cars per day in the year 1905, its rate of average daily traffic (ADT) has grown to about 100,000 vehicles per day (Kirchner, 2008).\(^{17}\)


To begin our road story, let us first introduce the cast of contaminating substances before they embark on their treacherous journey. Dramatis personae include: carbon monoxide, nitrogen oxide, hydrocarbons, sulfur dioxide, methane, organic pollutants such as PAHs, as well as heavy metals. Emissions from automobiles not only stem from the residues of complete fuel combustion (CO₂ and H₂O), but also from incomplete fuel combustion, leaking oil from engines and hydraulic systems, fuel contamination, fuel allowances, and the wear and tear of engine parts. We can add to this list atmospheric deposition from non-vehicular sources (e.g. emissions from nearby industry) and all kinds of discarded litter from passing cars. Like the pavement-milling of sidewalks mentioned above, pollutants on the AVUS also stem from abrasions of the road surface. In this case, the pavement-mill yields a fine particulate mixture of vehicular components such as the car body, its tires, brakes, clutch and motor parts. A detailed quantification of exact pollutants remains elusive however, as compositions vary from audi to opel to ford. The proprietary secrets of the automotive industry are only intimately known by roadside soils (Fig 6).

Most pollutants enter the scene in a gaseous state, streaming onto the road as aerosols. They then glide across the road surface with the rain and are deposited as suspended or dissolved particles. Depending on the type of road and the slope of the hard shoulder, water is transported in gushes, slips and sprays as far as ten meters across the adjacent roadside area (Golwer, 1991 and Kocher, 2007). With additional influence of wind and airflow, very fine particulate matter can be transported up to a distance of about twenty-five meters (Boller, 2006). This journey of molecular deposition casts its spell on all travelers involved, come they by car, foot, wing or gusts of wind. In comparison to natural levels for Berlin and Brandenburg, concentrations of all heavy metals at the soil surface were found in large amounts – as much as ten times the precautionary levels laid out by the German Federal Soil Protection and Contamination Ordinance (BBodSchV).

Roadside soils are no lullaby on Broadway. The highway is a hit parade of heavy metal anthems, starting off with zinc at the top.
of the charts with up to 804 mg/kg (approximately ten times higher than the normal levels), and followed by lead, cadmium and copper, with concentrations also measured five to eight times higher than the mean background values (Kocher et al., 2005). But, like a menacing biker gang of petty outlaws, heavy metals barely ever leave the road. Residual accumulations in roadside soils decrease with distance to the blacktop and with soil depth (e.g. Motto et al., 1970 and Li, 2005). And, as tested in a field and laboratory study by Kluge, potential risks might also be reduced by adding lime, clay or humic substances to the topsoil after construction work is completed (2010). And although it is clearly not advisable to pick the wildflowers or forage for mushrooms and berries along highway embankments and traffic rotaries, a pit stop at 100 m beside the highway is safe to human health.

Driving along we may enjoy the autumn foliage and stop to consider the chemical fate of weary oaks and creeping brambles along the freeway.

**A leaf falls haphazardly onto the asphalt, one of a million silent paper-thin messages printed with the nutrients of the summer’s glory.**

It presses instinctively against the ground ready to take part in the nutrient cycle of the ages, only to be met ungraciously by hard pavement pressing back. In the city, only small patches of the soil surface are unsealed, offering concentrated outlets for legions of fallen leaves eddied away from the asphalt. With over 12% of the total land area already sealed in Germany, and over 35% in Berlin, not only is the saga of the nutrient cycle inhibited, but also the cycling of water. Where infiltration does occur, it is concentrated in areas immediately adjacent to sealed surfaces.

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Annual infiltration rates at the roadsides of major streets or motorways, for example, are up to five times higher than the annual infiltration rates of sites not influenced by street runoff.

Along the AVUS, percolation measurements reached soil depths of up to twelve meters along the immediate shoulder and up to two meters in the splash zone (up to 5 m) (Kocher et al 2005). With little to no vegetation directly along the road, evapotranspiration is greatly reduced, making roads literally wet around the edges. Like moist ley lines racing through the landscape, roads can be thought of as linear percolation hotspots, with rates of more than double those of arable fields and up to five times as high as forested land. In an alternate reality with green machines and contained contamination, highways could be productive habitats, with miles of photovoltaic median strips to power cars and richly irrigated edge farms along the shoulder. Run-off would no longer be a dirty word and motorists would be nourished by fruits dangling along the roadside.

**Tunnels, Bridges, And Traffic Calming**

The story of drifting propagules along streets and highways is literally more uplifting than the journey of a single leaf into the nutrient pool of a small patch of unsealed soil. In a study on seed dispersal along urban-rural gradients, Von der Lippe points out how roads actually facilitate floristic mobility, encouraging the export of plant biodiversity from species rich city centers to surrounding suburban and rural areas. The study argues, among other things, that motorized vehicles are routine dispersal mechanisms that transport stowaway seeds across great distances (Von der Lippe & Kowarik, 2008). Isolated from rain, sunlight and fertile substrate in which to germinate, tunnels along major motorways act as in-situ seedbanks that archive the travels of seeds once clinging to tires, windows,

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26, 27

grids and other vehicle components. “Tunnel flora,” it turns out, are a sure indicator of human agency in species dispersal (see Pollinations p. 120).

Sealed off from the vadose zone, where seedbanks lie amongst the living, Von der Lippe collected and analysed thousands of seeds in order to demonstrate the dispersal patterns of different species along inbound and outbound lanes. As one might expect, lanes leading into the city from surrounding farmlands and forests were characterized by rural indicators of arable and woodland species. Lanes exiting the metropolis were characterized by ruderal species and dry meadow species typical of urban habitats (ibid).

Many of these ruderal species, however, are a sign of danger and betrayal likened to the most heart-breaking road-trip narratives.

“Exporting biodiversity” also means that blacktop dispersal poses possible risks of non-native species invasion. Of the “annual seed rain” found in three tunnels of the same highway in Berlin, 50% of the 204 species and 54.4% of the more than 10,000 seeds collected were non-native species (von der Lippe & Kowarik, 2008). The percentage of non-native species in outbound lanes was also higher than on in-coming lanes, and higher than the total percentage of non-native seeds (ibid.). Highways are thus not only polluted with noxious emissions, they can be populated with noxious weeds as well.

The drama of danger and misfortune on the open road only expands with the deer trapped in oncoming headlights, a clichéd but common tale. Although mitigation measures against animal mortality and habitat loss have become part and parcel of landscape planning responses to road projects, they are still few and far between. Typical wildlife mitigation measures include overpasses (green bridges) underpasses,
fences, movement-direction railings, glider poles, rope bridges and surveillance cameras to monitor movement. These measures are often expensive and time consuming to implement, a bandaid for bambi in favor of public and private interest groups. Highways however are not always habitat killers. Although paved roads result in fragmentation of habitat and gene pool as well as immanent harm for many animals, some species can actually benefit from increased movement along roads (Forman et al., 2003). While small mammals like the vole can be attracted to roadside vegetation, larger predators have been known to track prey along miles of isolated rural highways. For birds and bats, tree-lined alleys can provide important temporary habitats and orientation along migratory journeys. And in light of the increased linear percolation phenomenon mentioned above, a colony of pocket gophers was observed to expand their territory. Whole gopher towns were sighted taking advantage of the anomalous micro-watershed conditions along desert highways in California and Arizona (Huey, 1941). Spending most of their time underground in the soft, moist soil of the highway embankment, careers as roadkill did not feature highly for the creatures.

Such studies of physicochemical dynamics as well as biological diversity, distribution and disturbance along streets and highways can be bundled under the field of road ecology. Richard Forman defines this sub-order of ecosystems science as the study of interactions between organisms and environments linked to roads and vehicles. This can be further differentiated into the study of road systems located in built, forested, agricultural and grassy or arid landscapes. Road ecology is also supplemented with socio-economic research, such as Grove and Burch’s (1997) spatial comparison of vegetation and sealed structures with differentiated land-use. And traffic planning has become a major logistical task of sustainable urban planning (Wheeler and Beatl, 2004 and Register, 2006). This is exemplified by the concept of “traffic calming” (Newman and Kenworthy, 1999) as a means of reducing accidents and pollution on city streets while at the same time improving the ecological, economic and social circumstances of urban neighborhoods. Simple measures include:


Physically altering the street environment through different road textures; changing the geometry of the road through chicanes (also known as S-shaped diverters), neck-downs (also known as chokers), speed plateaus and bumps. And other traffic engineering devices; introducing new street furniture designed to create a more human, safe environment; and planting attractive landscaping (Newman and Kenworthy, 1999, 145).34

Softscaping streets detains rainwater runoff locally as well as providing habitat for urban flora and fauna and recreational and economic opportunities for city folk. Newman and Kenworthy (ibid) recommend traffic calming as a practical solution to many street-related problems without redesigning or replacing the whole roadway infrastructure. For the concept to succeed, however, scalability is key. Whole districts must be treated and not just single residential streets, and additional parking, bike paths, railways and other public transportation must be introduced or updated. To make streets more livable, many long-term strategies must be implemented. While it is a small tragedy that the mobility needs of others are so blatantly minimized in size and quality by the mobility desires of motorists, the road to recovery is long but resolute.

Creative Response:

Wishgardening
In a utopian reality, European buffalo graze on meadow corridors beneath elevated apartment buildings, perforated crosswalks allow worms greater mobility and ants take rides on formicidae furniculars (a miniature cable car for wingless insects). A creative collaboration between Alex Toland and Myriel Milicevic, the project Wunschgarten – Wild Urban Offshoots – was an exploration of the city’s wild features and creatures and a vision of alternative measures that reached beyond existing mitigation schemes and municipal green-space planning.

The city was perceived as a garden of unexpected edibles and an entwined network of human and non-human pathways.

The research area was the Soldiner Street neighborhood in the borough of Berlin-Wedding.

Water determined the habitat, from the lush banks of the River Panke, to runoff swells on neighboring streets. Sealed and unsealed spaces were mapped as potential food sources. All flora belonged to an integrated food network for humans and other species, which was differentiated into imported and local foodstuffs (e.g. black locust or basil from the market vs alder trees growing along the Panke). Planning concepts such as “life world oriented space” and “potential natural vegetation” were expanded with concepts of potential natural inhabitation, and a development of playful tools to encourage co-existence with nature: a seed apron to help plants disperse, a bird house backpack to help birds migrate and a mobile ground-grazing salad bar to identify the edible weeds of the streetscape pantry.

The exhibition space at the Art Laboratory Berlin was transformed into an urban planning workspace where visitors could explore the wild urban possibilities and create their own mitigation measures. In a period of three weeks, we took walks, interviewed local experts, analyzed local food networks and held readings. We set up a little desk library to encourage people to research their local environment. We studied and created maps, invented visionary measures for wild urban communities, and built tools and equipment for human-animal interaction. We created a wall map using regional soils as paint and made a 1:250 model of the immediate neighborhood out of kitchen herbs and spices. We distributed a smaller map to local restaurants and supermarkets and held a workshop to exchange ideas with experts and neighbors, to visit places on the map, and create new tools and measures for re-visioning the city. Coinciding with world parking day, we created a one square meter parking space for forest fauna visiting the city: deer parking (see Parking Day p. 131).

In a wild urban utopia, planning norms are not dictated by the needs of motorists or manufacturers, and concrete can be dreamed away to reveal the landscape hidden below.
In reality, mitigation is often little more than a wish to be harvested by the next generation. With the best of intentions, we planted a wishgarden (Fig. 7).

3. The End of the Road – A Few Concluding Remarks

Communicating the complexity and burden of the urban underground is equally important for soil protection goals in our cities and towns as the fundamental research that guides urban planning and environmental legislation. Traditional soil communication tools such as educational trails and natural history museums do well to inform people about the history and science of soils. But art can communicate a sense of magic and passion not generally accepted in scientific or urban planning contexts.

If soil science is the leading force in the pursuit or production of soil knowledge, visual art and its sister disciplines, design and the performing arts can be seen as articulating a form of soil knowledge (see also Kurt, 2003 and Toland et al., 2010).35, 36

Fig. 7 Alex Toland and Myriel Milicevic: Wunschergarten – Wild Urban Offshoots, workshop at Art Lab Berlin, 2010
This in turn can generate interest, inspiration and action in a wider public. As this book shows, art can help people identify with urban dirt as if their backyards and streetscapes were fertile valleys.

We intentionally focused our discussion here on the natural properties “beneath the pavement” as a fundamental point of departure for any kind of gardening as creative response. But it is important to emphasize that gardening is perhaps the most creative and empowering way that city people can engage with their environment. In recent years engaged gardening has attracted the attention of people from all walks of life, turning food production into a cultural spectacle and community event. Future Farmer’s *Victory Gardens* (Franceschini, 2008)\(^37\) (Fig 8), Fritz Haeg’s (2008) *Attack on the Front Lawn*, \(^38\) Leah Gauthier’s *Sharecropper*, PS1’s *Public Farm 1*, Nomadic Green’s *Prinzessinnengarten* in downtown Berlin, and the political gardens of *Beneath the Pavement* articulate a new form of artistic agency in urban areas worldwide. More than a form of vernacular landscape architecture, engaged gardening underlines communicative and educational goals of soil protection. These projects bring a sense of urgency and compassion to the city. They also emerge from a DIY culture that touts gardening as an open-source, spontaneous and powerful social medium.

The organized, interdependent production of food and natural beauty in urban space encourages direct contact with the environment as few other activities can.

But even more it can be seen as a defiant creative act of soil conservation in an overwhelmingly paved and hostile environment.


Fig. 8
Amy Franceschini,
San Francisco, 2008
But this is not the end of the road. The need for interdisciplinary research programs to support communication between soil scientists, planners, politicians, and other stakeholders is essential to the future of soil science. The cultivation of professional research partnerships is also necessary for accurate knowledge transfer between soil scientific and creative disciplines. Despite the growing trend of urban food production as art, not much is known about the extent of knowledge that avantgardeners have about filtering and buffering functions, the dangers of heavy metal emissions or the hydrological behaviors within the vadose zone. For farming, forestry or mitigation to truly function as sculptural or performative art, lasting interdisciplinary partnerships with scientific bodies are needed. For artists working with food production systems, long-term reclamation of degraded environments and social environmental justice, research and practical guidelines can assist knowledge transfer practices between soil science and the arts. It is our hope that through collaboration, crossdisciplinary action and a little courage, a more holistic and creative context of soil protection may be established. The culture of the vadose zone depends on it.
In a modern urbanised world, attitudes to shit and urine, whether human or animal, tend towards the negative. The received wisdom is that these are noisome and odious materials to be removed from their source as quickly as possible and, it might be remarked, without comment. History is littered with examples of the ingenious schemes designed to rid us of the effluent from which we cannot escape. We might think of the cloaca maxima, the sewers of ancient Rome, or the legal procedures of the Assizes of Nuisance in medieval London that fined those who defiled the streets. Our attention might be drawn to the efforts of Napoleon’s engineer Bruneseau or later the works of Haussman to clean up Paris, or to Albert Giblin, that forgotten hero of waste management whose early 19th century invention, the Silent Valveless Waste Water Preventer, was later popularized by the all too familiar Thomas Crapper. Across the centuries, the efficient removal of excreta from the domestic setting has become synonymous with ‘progress’ and civility. By the 18th century it was part of the discourse of improvement, a marker of polite society, a policy driven by the urban bourgeoisie.
The attitudes we express today towards shit, then, are not new. How we have come to view excreta has been coloured by political efforts, social reforms and feats of engineering which have sought to distance us from it stretching back at least two thousand years.

From state actions to the local responses of town authorities to the build up of filth, it has been the urban social elites that have led the way. In more recent centuries their cause has been bolstered by scientific advances such as the identification of cholera-inducing bacilli in the 1850s, which when coupled with greater concerns for public health and welfare, have resulted in shit being considered primarily as a vector for the spread of disease and a source of contamination. We have convinced ourselves that the only correct course of action is to steer clear of this material as far as is possible. In some quarters the resulting disassociation has become total.

The consequences for the common good are stark. Whilst urban policies such as the royal edict of 1539 (Laporte, 1993) which sought to tackle the unhygienic sanitary arrangements then found in Paris, and which have been built upon thereafter (Fig. 1), may have improved the lot of the town-dweller (cleaner streets, sweeter air, longevity etc.) the impact on the land has been nothing less than devastating. As has long been recognised, human and animal waste is the most plentiful and most beneficial fertilizer we have. There are reasons why Homer wished to talk of ‘Manure for the mighty holdings of Odysseus’ in the Iliad and why Virgil’s Georgics provide practical advice on its spreading. For when recycled on the land, human and animal excrement adds heart to the soil and

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Fig. 1 Prohibition of the dumping of waste outside the Marché de la Place d’Aligre, Paris.
guarantees good yields. When it is disposed of, something else has to be found to fill the gap. Typically these are artificial fertilizers, efficacious in the short-term but whose long-term damage has yet to be fully assessed. And this is to say nothing of the environmental catastrophe resulting from flushing our effluent directly into rivers and seas. It is simply criminal in a period of massive population increase, when it is imperative that more food is grown on an ever decreasing acreage, that we should have broken the human-waste cycle. As Justus von Leibig, the founder of agricultural chemistry, wrote in 1865 “The more fodder, the more flesh; the more flesh, the more manure; the more manure, the more grain” (Brock, 2002). Need any more be said? Yet those in power today do not seem to possess the will to change the current situation. Should our politicians wish to glimpse a future built on their inaction then they might usefully read William Morris’ News from Nowhere in which the palace of Westminster, now emptied of members of parliament, has become the repository for all of London’s unused ordure (1993). Likewise Hugo’s image of Paris provided in Les Misérables should haunt our collective conscience:

Fleets of vessels are despatched, at great expense, to collect the dung of petrels and penguins at the South Pole, and the incalculable elements of opulence which we have on hand, we send to the sea. All the human and animal manure which the world wastes, restored to the land instead of being cast into the water, would suffice to nourish the world.

Those heaps of filth at the gate-posts, those tumbrils of mud which jolt through the street by night, those terrible casks of the street department, those fetid droppings of subterranean mire, which the pavements hide from you. Do you know what they are? They are the meadow in flower, the green grass, wild thyme, thyme and sage, they are game, they are cattle, they are the satisfied bellows of great oxen in the evening, they are perfumed hay, they are golden wheat, they are the bread on your table, they are the warm blood in your veins, they are health, they are joy, they are life. (1862)

If literature does not produce the spur, then policy-makers should at least take note of the lessons of history. For they warn us that if we do not change our attitudes to faeces then we are on course for ruin. You can forget coal, steel


or steam, civilisation is founded on shit. More precisely civilisations are founded on what we do with it and how efficiently a putrefying mass can be converted into a valuable life restorative. The story of manure has underpinned human existence from the first sedentary communities of prehistoric farmers through to the present day. It is the great untold global metanarrative. The 19th century historian F.M. Maitland opined that “the demand for manure has played a large part in the human race” (1887).\(^5\) No more it would seem.

**Put succinctly, if irreverently, in the beginning was the word, and the word was manure.**

It was the foundation of the Neolithic agricultural revolution. As hunter-gatherer communities began to settle down and permanently cultivate small plots, so they were faced with the problem of how to keep the soil fertile over many years of activity. The solution was the domestication of animals, for not only did these animals provide the traction for ards, but now corralled and deprived of their extensive ranges, these early farming communities were able to gather their dung more easily and spread this on their fields. The modern city is a progeny of these Neolithic settlements. Surely it is worth reflecting on the role played by manure in the establishment of these prototypical centres and how it helped to create both place and community. Today the city’s buildings have embedded their foundations ever deeper in the soil but its inhabitants have lost this vital anchorage.

No better case can be mounted for the role played by manure in the rise and fall of empires than the case of ancient Rome. So important to Roman agriculture was manure that an origin myth developed around its introduction. It is to Pliny the Elder that we owe the story of Stercutus, the god of dung (1932-1962).\(^6\)
In the hands of Roman agronomists such as Cato, Varro and Columella, manuring became a science (1935 and 1941-1968). Careful attention was given to the properties of individual excreta. The droppings of pigeons were particularly praised. Human faeces and urine were also ranked highly, and were deemed to be superior to that of sheep and cattle, horses and pigs. Only the droppings of waterfowl were to be avoided. These writers counselled when particular manures should be applied, in what quantities, and to what crops and vegetables. Advice was given on the storage of manure to ensure that it retained its efficacy.

The instructions provided by these Roman sages would continue to dominate agrarian practice, both in Europe and beyond, well into the early modern period. In the hands of later writers such as Walter of Henley in England, Pietro di Crescenti in Italy, and filtering into the Islamic world through the works such as Ibn al Awwan’s Book of Agriculture, the basic principles they established were perpetuated across the centuries (Oschinsky, 1971 and Ibn Al-Awwân, 2000). When in 1806 the Irishman Richard Kirwan produced the first full-length treatise on manure written in the English language, The Manures most Advantageously Applicable to the Various Sorts of Soils, he still felt obliged to acknowledge the debt owed by farming at that time to these early writers (1806).

One example of this shared culture of manure is found in the practices of French peasants in the 19th century, who habitually drove a wooden stake through their dunghill in order to drive out snakes within. This association between the compost heap and these reptiles can be traced back to Pliny’s Natural History. It was he who first described how this problem should be dealt with. In the intervening centuries, the image of the infested mound percolated into literature: it is present for example in William Langland’s fourteenth-century work, Piers the Ploughman (1959); and it seems to have been the inspiration behind the rare image of a medieval dunghill found in the Luttrell Psalter (Fig. 2).

Rome itself may have been built on seven hills, but the economy that sustained it was built on manure. When in

7 Cato, On agriculture...


the ascendant, the empire was able to maintain a balance between the demands of the town and the countryside. As long as urban waste was recycled on to the fields, these continued to support Rome’s growing non-productive population. Problems began to arise, however, when this cycle was broken. As urban sewer systems washed this vital material away, the balance between input and output was lost, and the land became deprived of its nutrients. The consequence of Rome’s policy towards waste was perfectly summed up by von Leibig and Hugo:

*The cloacae of Rome ... absorbed all the well-being of the Roman peasant. When the campagna of Rome was ruined by the Roman sewer, Rome exhausted Italy, and when she had put Italy into her cloaca, she poured Sicily in, then Sardinia, then Africa. The sewer of Rome engulfed the world. This cloaca offered its maw to the city and to the globe. Urbi et orbi. Eternal city, unfathomable sewer.* (As cited by Kirwan, 1806)

The causes of Rome’s fall were varied and complex. It would be wrong to suggest that its failure to value urban waste as a fertilizer was the principal factor in the collapse of empire. Nevertheless, in some senses manure bookends the story of Rome. It can be found playing its part both at the beginning and at the end of this period of history. And if we stop for a minute to reflect on this, we would also recognise that it is playing a part in our history too.

One of the great historical conundrums is how Europe rose to become a dominant economic force in the world during the early middle ages and how it was able to maintain this position across more than a millennium. After all it was a relatively late starter. China was there long before us, so
too the Islamic world. In seeking an explanation, the global historian A.W. Crosby has recently singled out the presence in Europe of large numbers of domestic animals – cattle, horses, sheep and pigs – unequalled in other complex societies. These variously provided traction for the plough, allowing the heavy clays to be exploited; they provided a considerable source of protein in times of food crisis, helping to maintain relatively high populations; but above all they provided manure. “Where the Far Easterners”, he observed, “were obliged to use their own excrement for fertilizer … the Europeans could use the manure of their animals.” In view of the experience of Rome, we should find his thesis both seductive and persuasive. It is salutary to think of the dunghill as both the foundation and symbol of past European economic success. In an era when this position is under threat, the replacement of the dunghill by the butter mountain is a poetic reminder of all that is wrong with food politics in the West, its mismanagement and its insatiable greed.

Our relationship with the soil has constantly been negotiated and renegotiated across time.

This is good husbandry. However, in hindsight it would appear that this process reached a critical turning point during the second half of the 19th century. It was during this period that advances in chemistry and the perfection of industrial processes gave the world its first artificial fertilizers such as superphosphates. These must have appeared to be a universal panacea. By substituting clean chemicals for dirty organic waste, the nutrient gap could be filled, whilst at the same time efforts to clean up the city could be advanced more rapidly without the threat of declining agricultural returns. The farm became an open rather than closed system. Where previously farmers had relied on the recycling of locally-produced waste to keep their land in good condition, they now could access a range of specialized products designed for specific crops or soil conditions. What on earth could go wrong?
If we are to believe the rhetoric of the great agricultural reformers writing at the end of the 19th century, the answer is nothing. But here the witness of other times and places should not be ignored. In India there is now considerable debate about the future of farming as international conglomerates aggressively push forward monocultural practices using high-yield crops underpinned with the use of agrochemical fertilizers. This is threatening not only the livelihoods of small-scale farmers but also having an immediate and deleterious impact on the ecosystem itself. As one farmer in the region of Uttar Pradesh reported in 1990:

*Earlier ... no one knew about [chemical] fertilizer and people used to apply desi fertilizer (i.e. manure). Now, they mostly use market fertilizer: it makes the soil weak and deficient... so the soil is getting weaker...and the taste is diminishing in this way.* (Gupta, 1998)

Food losing its flavour, the very make-up of the soil is being destroyed, and farmers are required to buy in fertilizers and thus find themselves exposed to the vagaries of the market. This is a sorry indictment of the impact of chemical fertilizers on the lives of producers and consumers, and on the land itself. And yet governments and other international agencies, either frightened of, or in cahoots with, the powerful agrochemical lobby, turn a blind eye to the consequences of their actions.

Not everyone has been so passive in their response. The first half of the 20th century saw the publication of a number of influential treatises which rejected chemical fertilizers and advocated more organic methods. We might pick out inter alia Rudolf Steiner’s 1924 lectures published simply as *Agriculture*, Sir Albert Howard’s *An Agricultural Testament*, and Lady Eva Balfour’s *The Living Soil* (1993 and 1975). These statements of the efficacy of organic farming led to the formation of the Soil Association in 1946, which remains the most important voice for the organic movement. In the post-war period, in what might be described as a Malthusian ground swell, we have seen a return to more natural practices. This largely unchoreographed movement from below lies behind biodynamic farming, organic farming, local food, and slow

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food movement. What articulates the practice and philosophy of this amorphous group of individuals and organisations is a concern for the environment and the future of the soil. As a consequence those involved are increasingly discarding the chemical solution and returning to the very principles that guided farming throughout the pre-industrial era.

When shit becomes manure, something magical occurs, akin to transubstantiation. It is no wonder that people have been fascinated by this metamorphosis from time immemorial.

**From dead and decaying matter, through the process of putrefaction, comes a substance that can restore life.**

One does not need to labour the religious parallels this image provokes. Rather, here I have tried to outline some of the lessons of history. It is societies that negotiate a balance between the human and natural realms that are strong societies; it is those that take no account of the reciprocity required to sustain this relationship, whose primary concern lies with people rather than the land, that invariably fail. When we think, in this context, of where we now find ourselves, then we are right to exclaim ‘Oh shit’. Because viewed over the long expanse of time, history screams to us that we now arrived at a moment of decision. We either face up to this crisis and look to return to systems of waste management and farming that can be self-sustaining (and in the West that means getting over our phobia of human faeces), or we accept that our fate is sealed. The organic movement may have begun as an exercise in idealism; for a long time it may have been preserve of a middle classes and cruelly mocked by those looking in from outside; but possibly, just possibly, it is this reconfiguration of the human-nature balance that will save our collective arses from whence our shit has come. The time for roses is over. Now it is time to sit up and smell the organic manure (Fig. 3 and 4).
FREE MANURE

PLEASE RETURN BAGS
While the renderings of systems and accounts of states that you find collected here are imaginary, many details originate from observations of actual experiences. For example, from a visit to a composting enterprise, where any documentation of decaying procedures (such as the cannons positioned around rotting hills, to shoot a smell of cherries in the air) was strictly prohibited; or from the interrogation procedures upon crossing the British border, which involved a debate on classifications of art and the practice of landscape painting.

At the same time, these depictions have been inspired by existing political systems and their possible counterparts in plant communities: do plants live in a photosynthcracy? What would a Pollination look like? Do plant communities organise in a Commonwealth? Can actual political systems, invented by humans, be found again in nature? Or have people tried to create political structures in order to break away from nature and its laws? The following entries each represent one possibility.
Upon entering the State of Undergrowth, the traveller has to anticipate several days or even weeks of thorough interrogations and paper work. Questions can include aspects of origin and species, potential enemies or personal perspectives on landscape painting. While there are no wrong answers, the admission is only granted once the traveller denies all interest in botanical espionage: it is strictly forbidden to collect any information on techniques of composting.

The technocratic procedures had been introduced to gain some governance over the State of Undergrowth. Habitants had been counted, measured, and health checked, fields and horizons had been charted. A bureau for
tracking incoming and outgoing resources had been put into place.

However, with the constantly changing population, unmanageable communication systems and disorderly traffic of pollen and papilionaceae, the mapping and gathering of information proved to be impossible, and the technocratic system now simply governs and charts itself, detached from the state's actual plant life.

In the meantime, the thriving in the undergrowth evolved into dreadful competitions among those trees that believe that big crowns will lead to big thinking, and therefore to domination over those that are doomed to linger down in the shade. These plants incautiously inflate their crowns to oversize and too often a head bursts in a tremendous explosion of raining leaves, echoing through the forests, only giving way for others to hastily follow their example.

The state's true rulers live in the undergrowth, and are so blended into their environment that no foreign wanderer ever catches a glimpse. To them, the seeming state of confusion and disorder appears as pure logic and the best of all possible organizations.

The Antipode State of Undergrowth
When crossing the equator and entering the antipodal state, a completely different picture presents itself: each tree grows at an equal distance to its neighbouring tree, and all trees are chopped along a line at the exact same height. With one cloud above each tree, the cut-open crowns serve as rainwater collecting tanks, funneling the stream to feed the grand mushroom underground. The grand mushroom is the actual centre and ruler: all plants are connected to its roots and there is equal exchange of carbon, water and minerals to each habitant.

Here, undergrowth is prohibited by sealed soils: cities and streets are between every pair of trees. The cities are all of the same size and enjoy a fresh supply of fruit falling directly into their markets.
Kakistocracy

A form of government that had never been conceived as such by a theoretician or gardener, nor any other principled mind. Its origin lays on a pile of dung and wastes that grew into a formation of steaming hills – moldy prospect mounds that are ruled by gulls, who are the most opportunistic of all citizens.

Under a system of Kakistocracy, the integrity of the heap is usually defended by a cherry-blossom-scent blasting system. Its economy grows from its continuous import of organic wastes and export of exquisite fertilizers.
A Pollination is a coincidental collection of propagules that seek their moment of propagation.

A particular form of Pollination can be found beneath pavements: as blossom dust and seeds are carried by wind, people, vehicles and bicycles, they fall from wheels, fur and shoes, and accumulate to form gigantic pollen populations in dry and dark urban tunnels, underpasses and canalisation systems.

Pollinations are heterotopias, microcosms of different plants carried into a place where they exist and yet don't exist. It is a state that awaits its time to be washed out and explode in a surprising spring.
Commonwealth of Gardens

The Commonwealth of Gardens is an unofficial organization of sovereign gardens that had formerly been tended as dominions for food supply, but then were abandoned. The German term “Gartenkolonie” refers to this concept of allotments.

The Commonwealth’s Tract of Tracts is founded on principles and values of botanical rights, free soil, multi-diversity, law of seasons, shelter for refuseeds, niche culture, and the abolition of the concept of “weeds”.

Since its beginning, all types of gardens have joined this voluntary political community and benefitted from its widely rooted network, such as walled gardens, cottage gardens, heirloom gardens, potagers, knot gardens, even roof and hanging gardens.

Most of all Commonwealth gardens offer free fruit to harvesters and gleaners.
Photosynthecracy

A social structure in which transformation of light is the central economy. Every member of society participates in the process of photosynthesis, ideally receiving equal resources and providing food to other social systems. In this structure, political power is never lodged with an individual.
LANDMARKS & PEBBLES

This glossary is a palimpsest intended to be continuously revised and complemented. Without any intention to practicality and truly committed to the principle of serendipity the glossary involves a wide-ranging assemblage of ideas, projects and existing works from various fields: film and photography, video and TV, social media and philosophy. This ambiguity is neither coincidental nor meaningless: the values and methods of these approaches and initiatives deliberately oscillate between artistic creativity and alternative models of social organisation, designed to challenge established conceptions of art in public space and political activism and explore the in-between.

By questioning lifestyles, social organisation, political ideals and cultural values this collection represent a snapshot of contemporary avantgardening in the city. YouTube videos, toolkits and gimmicks – all these interventions acquire and hence reinvent urban space. However ephemeral and temporal, they strive on the somehow contagious spirit of DIY and self-organization; committed to live up to the original promise of the city ...

For anyone interested in contemporary urban practices this glossary provides a list of inspirations in alphabetical order to further explore the beach beneath the pavement. These examples are not the only pebbles on the beach ...
ANIMALS IN THE CITY
BEACH UNDER THE PAVEMENT
(FILMSTILL ‚DIE STRÄNDE VON AGNÈS‘)

CRISIS? WHAT CRISIS?

ENERGY FROM YOUR FOOTPRINTS

Paving slabs harvest kinetic energy in high footfall environments converting it into electricity.
(www.pavegensystems.co.uk)

FUTURE FARMERS

Artists, local residents, scientists, activists working together – self-organized, often precarious, interactive, ... Remember:

From the 1960s through most of the 1990s, the Left considered environmentalism to be ‘soft politics’. While the bold action of Greenpeace and the extremes of ‘eco-terrorism’ had to be acknowledged, for the most part those who supposedly cared more for the earth and its creatures/creations than for people’s revolutions were perceived as acting from a kind of political suburbia. Today, sparked by indisputable proof of human agency in climate change, the environment is in the centre foreground. It has become the radical edge. (Lucy Lippard, Beyond the Beauty Strip)

Never doubt that a small group of thoughtful, committed people can change the world. Indeed, it is the only thing that ever has. (Margaret Mead)

A revolution doesn’t happen when a society adopts new tools, it happens when a society adopts new behaviours. (Clay Shirky, Here Comes Everybody. The Power of Organizing Without Organizations)

abbygardens.org
avantgardening.org.uk
urbanacker.net
rosarose-garten.net
greenmaps
Myvillages.org
GREENAID: SEEDBOMBS FOR CHANGE

Made from a mixture of clay, compost, and seeds, “seedbombs” are becoming an increasingly popular means combating the many forgotten grey spaces we encounter everyday—from sidewalk cracks to vacant lots and parking medians. They can be thrown anonymously into these derelict urban sites to temporarily reclaim and transform them into places worth looking at and caring for. The Greenaid dispensary simply makes these guerilla gardening efforts more accessible to all by appropriating the existing distribution system of the quarter operated candy machine. Using just the loose coins in your pocket, you can make a small but meaningful contribution to the beautification of your city!
INTERCULTURAL GARDENS

The very first intercultural garden in Berlin is located in the district Treptow-Köpenick. People from Kazakhstan and Vietnam, from Russia, Egypt and Hungary, from India and Afghanistan, the Ukraine, Bosnia and Germany jointly cultivate an area of 4000 square meters. (http://www.stiftung-interkultur.de/garden-portraits/berlin-koepenick-wuhlegarten)

HETERO TOPIAS

(Michel Foucault, Of Other Spaces, 1967)

“Third principle. The heterotopia is capable of juxtaposing in a single real place several spaces, several sites that are in themselves incompatible. Thus it is that the theater brings onto the rectangle of the stage, one after the other, a whole series of places that are foreign to one another; thus it is that the cinema is a very odd rectangular room, at the end of which, on a two-dimensional screen, one sees the projection of a three-dimensional space, but perhaps the oldest example of these heterotopias that take the form of contradictory sites is the garden. We must not forget that in the Orient the garden, an astonishing creation that is now a thousand years old, had very deep and seemingly superimposed meanings. The traditional garden of the Persians was a sacred space that was supposed to bring together inside its rectangle four parts representing the four parts of the world, with a space still more sacred than the others that were like an umbilicus, the navel of the world at its center (the basin and water fountain were there); and all the vegetation of the garden was supposed to come together in this space, in this sort of microcosm. As for carpets, they were originally reproductions of gardens (the garden is a rug onto which the whole world comes to enact its symbolic perfection, and the rug is a sort of garden that can move across space). The garden is the smallest parcel of the world and then it is the totality of the world. The garden has been a sort of happy, universalizing heterotopia since the beginnings of antiquity (our modern zoological gardens spring from that source).”
Lebensreform (“life reform”) was a social movement in late 19th century and early 20th century Germany and Switzerland that propagated a back-to-nature lifestyle, emphasizing among others health food/raw food/organic food, nudism, sexual liberation, alternative medicine, and religious reform and at the same time abstention from alcohol, tobacco, drugs, and vaccines.

Monte verità is a hill in Ascona on the shores of Lake Maggiore which was inhabited, from 1900, by a community of intellectuals and artists committed to a new and healthier way of life.

In 1893, 18 vegetarians founded an orchard colony: The vegetarian fruit-growing colony Eden Oranienburg. The first vegetarian colony in Germany developed alternatives for a healthy life existing in harmony with nature. The grounds of the present-day cooperative are home to the Eden Café, a kindergarten and the Eden music workshop. (http://www.eden-eg.de/)

Tarnac 9: The Tarnac Nine are nine alleged anarchist saboteurs arrested in the village of Tarnac, France in November 2008 in relation to a series of instances of direct action. The French police entered Tarnac with helicopters and dogs and dragged the suspects from their beds. Around twenty people were arrested on November 11, 2008, and nine of those were charged with “criminal association for the purposes of terrorist activity”.

Movements can be broadly defined as a series of contentious performances, displays and campaigns by which ‘ordinary’ people make collective claims on others. Beyond the established channels and protocols of parliament, political parties and advocacy groups they constitute a vehicle for people’s participation in public politics.

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More Movements
NEIGHBOURHOOD GLOBAL

Nabuur.com is an online volunteering platform that links Neighbours (online volunteers) with Villages (local communities) in Africa, Asia and Latin America. Connected through Nabuur.com, Neighbours and local communities learn about each other, share ideas and find solutions to local issues.

ONLINE GAMES: PLAY OILIGARCHY!

Now you can be the protagonist of the petroleum era: explore and drill around the world, corrupt politicians, stop alternative energies and increase the oil addiction. Be sure to have fun before the resources begin to deplete. Go to: www.molleindustria.org

See also: Games for Change, serious games, social impact games

PARK(ING) DAY
BATTLE 2009, BERLIN/FRIEDRICHSTRASSE

Park(ing) Day: PARKground to PARK!

Parks can be a secular paradise. Traditional gardening or land art, for leisure or play, whether Alhambra or Babylon, Park Fiction in Hamburg, Disneyland in Florida or the Tiergarten in Berlin: Parks hold the promise of a joyful life beyond work and daily routine.

Who owns the city?

PARK(ing) Day is an annual, one-day global event where artists, activists and citizens collaborate to temporarily transform metered parking spots into “PARK(ing)” spaces: temporary public parks. Originally invented by REBAR, an interdisciplinary studio operating at the intersection of art, design and activism, PARK(ing) Day is an open source invention, which means anyone can participate.

PARK(ing) Day is art in public space as practice! – a friendly and practical critique of city planning which neglects the demands and desires of people opposed to consumption and retail interests of corporates, car lobbyists and investors.
A sustainable urban policy strives on the creativity of its inhabitants and guests. Climate change and demographic change, urban segregation and gentrification, just to name a few of current problems we confront in our daily (and future) lives, to illustrate that we fundamentally need to re-think our concept of urban citizenship, of ecologic justice, mobility and public space. Spaces of playful encounter with strangers, Moments of friendly irritation and casual chat, that opens-up new perspectives for enliving the city.

(RE)GREENING URBAN SPACE

(Above) Dear thieves, please allow these beautiful flowers and plants to stand here, so that we can all rejoice it. Thanks. Mar Ann’s

(Above) WonderBeauty. Also on Facebook
Co-operation ... makes it happen
Co-operation ... working together

Dig it! (Refrain)

Muppet In Shades: I saw these crazy dudes and they went out on the street they were cleanin' out the empty lot and makin' it neat! I said, "Man is this cool, what you tryin' to do?"

They said, "Makin' a garden for me and for you."

They said, Hey man, join us! Come on, let's go! Together we can make a pretty garden grow.

Girl: I'll dig a hole
Guy: And I'll plant a seed
Together: And we can add the water. That all growin' things need.

(Chorus)

(Scene changes to the front of a building, with 2 other Muppet guys)

Muppet In Shades: Now we friends were on the corner Hangin' out, I said, "Hey, you can hang around these garbage cans some other day!"

They said, "Man is this cool! What you tryin' to do?"

I said, "Make a street garden, for me and for you!"

I said, "Hey cats, join us, Ccome on, let's go! We'll all co-operate and make a garden grow.

You dig a hole, and I'll plant a seed, and we will add the water, that all growing things need!"

(Chorus)

(Back to the garden, where the plants have begun to grow)

Muppet In Shades: Now we watch our garden grow, and we come back every day.

And the people in our neighborhood, come 'round and say:

2 Friends: "Hey man, this is cool! Tell us what we can do to keep this pretty garden here for me and for you!"

Everybody Else: We all say, "Hey, join us! Come on, dig the scene. We'll all co-operate, and keep our garden green!

Girl: You trim the leaves
Guy: And you pull the weeds
Girl: And I will add the water
That all growing things need!
(Chorus)
WIKIWOODS
(http://www.wikiwoods.org)

Become active: plant trees with volunteers.

WikiWoods is an initiative getting involved in the process of helping forests and woods to grow and flourish in a natural way - worldwide. The use of an internet platform similar to the Wikipedia platform helps to make it possible for volunteers, experts and sponsors to meet on the web and work together on local projects. Through the platform, everyone who wishes can get involved in climate defense, get active on a local level and contribute to the global protection of environment. This way CO2 emissions are reduced by a growing number of trees, biodiversity is supported, environmental awareness is increased and also the local climate is influenced in a positive way.
READING

The Athenian Experiment: Building an Imagined Political Community in Ancient Attica, 508-490 B.C. Greg Anderson

Aristotle on Nature and Incomplete Substance Sheldon M. Cohen

Candide Voltaire

City Bountiful: A Century Of Community Gardening In America Laura Lawson

Civic Agriculture: Reconnecting Farm, Food And Community Thomas A. Lyson

The Dictionary Of Imaginary Places Alberto Manguel And Gianni Guadalupi

Farm Together Now Amy Franceschini and Daniel Tucker

Fourier: The Theory of the the Four Movements Charles Fourier

Gareth Stedman Jones, and Ian Patterson

Ideal Commonwealths Bacon, Campanella, More, Plutarch, and Morley

New Atlantis Francis Bacon

The Power Of Place Dolores Hayden

Socrates and the political community: an ancient debate Mary P. Nichols


Utopia Thomas More

FILM

The Garden: Documentary of South Central Farm Scott Hamilton Kennedy

The Gleaners and I (French: Les glaneurs et la glaneuse) Agnès Varda
BIographies

**Stephen Burt**  
(American, born 1962)  
Stephen Burt is painter and printmaker living and working in Portland, Maine. Born in Deland, Florida in 1962, Stephen Burt has traveled extensively and most notably lived in Tehran, Iran from 1976 through 1978, witnessing the revolution. This formative period in the artist's life nurtured both an interest in the power of decorative form drawn from Islamic art and an abiding interest in the dynamics of human passions.  
An active member of Peregrine Press in Portland, Maine, Burt currently teaches drawing, painting and design at the University of New England.

**Pat Heslop-Harrison**  
Pat was born in Northern Ireland, and brought up in Birmingham and London (England) and Madison (Wisconsin), before studying in Massachusetts, Wales, and Cambridge UK. After working at institutes including the Plant Breeding Institute (at the time, the dominant breeder for wheat and several other crops in Europe), he became Professor of Plant Cell Biology and Molecular Cytogenetics at the University of Leicester, in the middle of England. There, he works on measuring biodiversity and finding the closest ancestors of crop species, genetics with a focus on sub-tropical species, and methods to use diversity in crop breeding.

**Amy Franceschini**  
Amy Franceschini is an artist and educator who uses various media to encourage formats of exchange and production, many times in collaboration with other practitioners. An overarching theme in her work is a perceived conflict between humans and nature. Her projects reveal the history and currents of contradictions related to this divide by collectively challenging systems of exchange and the tools we use to “hunt” and “gather.” Using this as a starting point, she often provides a playful entry point and tools for an audience to gain insight into deeper fields of inquiry—not only to imagine, but to participate in and initiate change in the places we live.

Amy founded the artists collective and design studio Futurefarmers in 1995, and co-founded Free Soil in 2004. Futurefarmers’ design studio serves as a platform to support art projects, an artist-in-residency program and research interests.

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[www.futurefarmers.com](http://www.futurefarmers.com)  
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[www.moicyt.com](http://www.moicyt.com)  
[www.AoBBlog.com](http://www.AoBBlog.com)  
Pat was born in Northern Ireland, and brought up in Birmingham and London (England) and Madison (Wisconsin), before studying in Massachusetts, Wales, and Cambridge UK. After working at institutes including the Plant Breeding Institute (at the time, the dominant breeder for wheat and several other crops in Europe), he became Professor of Plant Cell Biology and Molecular Cytogenetics at the University of Leicester, in the middle of England. There, he works on measuring biodiversity and finding the closest ancestors of crop species, genetics with a focus on sub-tropical species, and methods to use diversity in crop breeding.

**Paula Marie Hildebrandt**  
[www.paulahildebrandt.de](http://www.paulahildebrandt.de)  
(German, born 1976)  
Political scientist, curator, urban researcher – Paula's work involves deliberately blurring the lines between social science, contemporary art, politics, and a host of other disciplines to construct unfamiliar, meticulously researched ways to interpret the way around us. Her teaching and research work includes a phd at the Bauhaus University Weimar and lecturing at the arts-college Berlin-Weißensee on “Space strategies”. Projects and exhibitions include: ÜBER LEBENSKUNST (an initiative of the Federal Cultural Foundation and the Haus der Kulturen der Welt) +++ PÖPP 68 – private, public, personal, political (NGBK). She is co-founder of various sustainability initiatives (3plusX, repairberlin) and former project manager for the Deutsche Gesellschaft für Technische Zusammenarbeit and the United Nations Development Program (New York, Ghana and Thailand). Education at the Freie Universität Berlin (political science), Universities of Sussex (MA in Global Political Economy) and Cambridge (Brokering cross-sector partnerships).
Richard Jones
Richard Jones is Lecturer in Landscape History in the Centre for English Local History, University of Leicester. He is currently editing a volume entitled Manure: Historical, Archaeological and Ethnographic Perspectives that will appear with Ashgate Publishers in 2011. Email: rlcj1@le.ac.uk

Ellen Keith
www.ellenkeith.com
Ellen is a Graphic Designer and an Urbanist. She holds a BFA in Graphic Design from California College of the Arts and a BA in Urban Studies from San Francisco State University. She sees design as a way to bridge her passion for the urban environment with the visualization of information. In her practice she strives to design pieces that serve to expand discourse related to conservation, education and the pursuit of happiness.

Henrik Lebuhn
Henrik Lebuhn lives in Berlin and San Francisco. He is a co-editor for PROKLA – Journal for Critical Social Science and teaches urban and regional sociology at Humboldt University Berlin. His research interests include city politics, urban social movements, migration and border regimes. At some point in the not too distant future, he would love to collaborate with an artist on a kids’ activist book.

Kobe Matthys // Agency
Agency is the generic name of an agency that was founded in 1992 by artist Kobe Matthys and is based in Brussels. Agency constitutes an ongoing list of things that witness hesitation in terms of the bifurcation of nature into the classifications ‘nature’ and ‘culture’. This list of things is derived from juridical processes, lawsuits, cases, controversies, affairs and so forth, where this bifurcation has been discussed. Agency invokes these things during varying assemblies inside exhibitions.

Myriel Milicevic
www.neighbourhoodsatellites.com
Myriel is an artist, researcher and interaction designer based in Berlin. With her Neighbourhood Satellites she explores the hidden connections between people and their natural, social, and technical environments. These explorations are mostly of a participatory nature, emerging from collaborations with other artists and scientists, in the context of workshops, classrooms, exhibitions, residencies and out in the field.

Myriel received her MA from the Interaction Design Institute Ivrea, Italy and her diploma in Graphic Design from the Gerrit Rietveld Academie, Amsterdam. Further, she followed studies at the Conceptual and Information Arts department of San Francisco State University as part of her education.

Maria Rosales
Maria Rosales is an assistant professor of political science at Guilford College. She received her Ph.D. from the University of California, Berkeley. She lives in North Carolina with her partner and their dog, who seems convinced that she is helping when she digs in the garden.

Alex Toland
www.boden.tu-berlin.de
www.fertileground.de
Alex Toland is a visual artist and environmental planner. She has been a research fellow in the DFG Graduate Research Program “Perspectives on Urban Ecology III” at the TU-Berlin, Dept. of Soil Protection since 2009. She works a freelance photographer for the environmental visualization firm Lenne 3D and has participated as a design researcher at the Wriezener Park Open Space Lab in Berlin-Friedrichshain. She lectures, has exhibited work in Europe and the United States and has published on the topics of environmental art and aesthetics as they apply to soil protection issues.

Gerd Wessolek
www.boden.tu-berlin.de/
Professor Gerd Wessolek is a soil physicist and painter who has pioneered efforts at giving soils and soil science a broader exposure to the wider community through presentations, exhibitions, and soil art projects. Information on his research on urban soils in the vadose zone and an on-line gallery can be found at http://www.boden.tu-berlin.de. Since 1999 he has been chair of the soil protection department at the Berlin University of Technology.
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(c) Assembly (Beneath the pavement: A Garden). Agency

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Field Scape: Projects, proposals and essays from various fields

On Gardens & Politics
Artwork courtesy of Stephen Burt

Farming From its Origin to Tomorrow
Images courtesy of Pat Heslop-Harrison

Assembly (Beneath the Pavement: A Garden)
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Oh Shit
p.115 Richard Jones

Urban Garden Glossary
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If you start taking the cobblestones out of the street, people will pass by and ask you what you are doing. When you tell them, “Sous les pavés, le jardin!”, they will begin dismantling the streets with you. A critical mass of antipode gardeners will emerge – the polis will begin to fall and new configurations will rise, take root.