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Building Research & Information

ISSN: 0961-3218 (Print) 1466-4321 (Online) Journal homepage: https://www.tandfonline.com/loi/rbri20

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To cite this article: Raymond J. Cole (2012) Regenerative design and development: current theory and practice, Building Research & Information, 40:1, 1-6, DOI: 10.1080/09613218.2012.617516

To link to this article: https://doi.org/10.1080/09613218.2012.617516

BRI Building Research & Information (2012) 40(1), 1–6

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EDITORIAL

Regenerative design and development: current theory and practice

Raymond J. Cole

Following the 1871 Great Chicago Fire, the erection of Henry Hering's 1928 memorial sculpture – *Regeneration* – carried the inscription:

> The Great Chicago Fire in October Eighteen Hundred and Seventy One, devastated the City. From its ashes the people of Chicago caused a new city to rise, imbued with that indomitable spirit and energy by which they have ever been guided.

This notion of regeneration – 'rebirth' or 'renewal' – has been variously applied in relation to the built environment and the communities it supports following major acts of devastation or when a prior condition had declined to an extent considered ripe for renewal – and, of course, where the commitment has been found to initiate rebuilding. The resulting transformed condition, while embodying traces from its prior condition, is infused with new aspirations and possibilities. Over the past years, however, regeneration has been garnering increasing interest as a means of reframing green building practices and, carrying with it, qualitatively different and broader connotations than that used previously.

This special issue of *Building Research & Information* explores the current theory and practice of 'regenerative' design as it applies to community planning and building design. Regenerative design, as used here, relates to approaches that support the co-evolution of human and natural systems in a partnered relationship. It is not the building that is 'regenerated' in the same sense as the self-healing and self-organizing attributes of a living system, but by the ways that the act of building can be a catalyst for positive change within the unique 'place' in which it is situated. Within regenerative development, built projects, stakeholder processes and inhabitation are collectively focused on enhancing life in all its manifestations – human, other species, ecological systems – through an enduring responsibility of stewardship.

The issue includes eight papers. Those by du Plessis, Mang and Reed, and Cole, individually and collectively, provide insights into the key characteristics of regenerative design, and that by Pedersen-Zari explores how ecosystem services available in a particular place can provide appropriate performance targets. Hoxie *et al.*'s paper offers several built projects that, along with those included within Mang and Reed's paper, provide a measure of how regenerative ideas are currently evidenced in practice. The papers by Svec *et al.*, Plaut *et al.*, and Cole *et al.* describe emerging design support tools created to assist designers, communities and other stakeholders bridge between the theory and conceptual basis of regenerative design with current building practice.

Why is regenerative design gaining prominence? Certainly in North America there has been the search for complementary or alternative performance aspirations and approaches to those both evident in, and as a result of, the US Leadership in Energy and Environment (LEED) green building rating system. While having proven to be an enormously valuable vehicle for mainstreaming green building practice, LEED's checklist format that allows users to select what are deemed achievable credits is considered by many as incapable of guiding design in a systems-approach manner and establishing positive links with its context. But reaction *against* LEED and other current assessment methods perhaps represents only a relatively minor reason for the increasing appeal of regenerative design. The papers herein suggest a much more fundamental basis for its appeal born out of the convergence of a number of historical threads that have either been latent or running parallel to conventional green building discourse and practice over the past 40 years or so. Moreover, while many of its core tenets – systems thinking, community engagement, respect for place – also have long *individual* histories in architectural discourse and practice, regenerative design begins to tie them together in a cogent manner.

Within the regenerative design literature, shifting the prevailing paradigm – the set of beliefs and assumptions that constitute a particular 'world view' – is central. The worldviews held by a society operate silently to:

> channel attention, filter information, categorize experience, anchor interpretation, orient learning,

Building Research & Information ISSN 0961-3218 print/ISSN 1466-4321 online
http://www.tandfonline.com/journals
http://dx.doi.org/10.1080/09613218.2012.617516

> establish moods, secrete norms, and legitimates narratives, ideologies, and power structures.
> (Gladwin *et al.*, 1997, p. 245)

Worldviews have, historically, taken centuries to mature and become manifest in the shaping of human endeavours, including human settlement patterns and building practices. Western societies remain largely entrapped in the dominant Cartesian–Newtonian mechanistic worldview of the mid-17th century, one that implicitly places human enterprise dominant over and essentially independent of nature. What is of particular concern to the ideas explored in this special issue is, what Gladwin *et al.* argue, that human minds have evolved in ways that render them unable to comprehend, let alone begin to address, the challenge of sustainability. These now ingrained biases that favour notions such as simplicity, certainty and immediacy, they suggest, 'serve to impede adaptive learning deemed essential for sustainability' (Gladwin *et al.*, 1997, p. 243).

Capra (1996) illustrates how the reductive approaches to scientific enquiry dominant for over the past few centuries are gradually succumbing to the holistic nature of the disciplines of biology and ecology and how the machine metaphor is being replaced by one of networks. Du Plessis and Cole (2011) reference more recent emerging evidence of a shift to a new worldview, one that is happening at:

> many levels and through both diffusion, as more and more actors adopt new values, practices and technologies until it becomes mainstream, and transferring of ideas through actor-networks.
> (p. 437)

Du Plessis's paper in this special issue provides a detailed history that maps the evolutionary journey of sustainability as humanity negotiates the transitional zone between a mechanistic and a whole/living systems worldview. She argues that the two current dominant strains of sustainability – a 'politically negotiated version' championed by international bodies such as the United Nations and The World Bank and a business case for sustainability developed amongst the private sector that is built around the ideas of efficiency – 'have reached an evolutionary dead-end' due to 'flawed underlying assumptions, systemic inertia, and the inability [to deal with] complex and living systems, (p. 19). Her paper makes the compelling case for the necessity of a 'regenerative sustainability paradigm' that attempts to:

> address the dysfunctional human–nature relationship by entering into a co-creative partnership with nature [and aims] to restore and regenerate the global social–ecological system through a set of localized ecological design and engineering practices rooted in the context and its social–ecological narratives.
> (p. 19)

Regenerative design challenges the orthodoxy of current green building practice and the design tools that support it. Building environmental assessment methods were initiated by and have evolved within the domain of mainstream building practice. They have been premised on incremental advances rather than more fundamental challenging of practice norms. There have, of course, always been alternative voices and associated practices to the mainstream, particularly following the post-Second World War period of turmoil and unprecedented reaction and opposition when a new generation openly challenged numerous social norms and practices. This context signalled the emergence of the environmental movement and a growing 'grass-roots' awareness of environmental values. The underlying principles and aspirations of a host of 'alternative' voices, literatures and approaches – bioregionalism, permaculture, ecological design – are not only central to regenerative design, but also are increasingly evidenced within 'mainstream' discourse. With regenerative design and development one is, perhaps, witnessing the convergence and assimilation of what were once considered idealistic and seemingly distant notions, now as necessary and potent directives for current best practice and future mainstream practice.

To encourage people to engage and respond to environmental issues with a sense of urgency, persuasive appeals have consistently stressed the negative consequences of failing to ameliorate them (Eagly and Kulesa, 1997). Since the publication of its First Assessment Report in 1990, the Intergovernmental Panel on Climate Change (IPCC) has offered compelling evidence of the consequences on climate change resulting from unabated global warming. Their conclusions have been variously cast in terms of alarm, pessimism and a depressing possible future – notions that, although characterizing and conveying clear warning and risk, the public has shown little interest in maintaining tolerance and engagement. History, by contrast, suggests that offering a positive vision that strikes accord with human values may be more effective in creating change than presentation of alarming facts. Shellenberger and Nordhaus (2004), for example, emphasize that effective leadership during troubled times involves 'inspiring hope against fear, love against injustice, and power against powerlessness' and offering a 'positive, transformative vision' that creates the 'cognitive space for assumptions to be challenged and new ideas to surface' (p. 31). Implicit here is the potency of approaches that offer positive direction and encourage collective action to solve environmental problems.

A similar distinction exists within the framing of green and regenerative approaches to design. Cole's paper in this issue provides the key characteristics of green design and associated assessment methods as the

basis for highlighting distinctions and relationships with sustainability and regenerative approaches. The emphasis and language of green design is largely one of reducing resource use and adverse environmental impacts of buildings. Regeneration, in contrast to this emphasis on 'doing less harm', carries the positive message of considering the act of building as one that can give back more than it receives and thereby over time building social and natural capital. While Cole emphasizes that the performance requirements of both green and regenerative design are both necessary, the overall positive framing of the latter will likely prove more attractive to designers and stakeholders. There is, of course, a need to maintain focus and engagement on current pressing environmental issues such as climate change and loss of biodiversity, while consciously laying the foundation for the future benefits emphasized through regenerative design and development – the complementary emphases of green and regenerative design respectively.

Regenerative design accepts and promotes 'place' as the primary starting point for design and:

> connecting people back to the spirit of place in a way that they are vitalized by it and become intrinsically motivated to care for it.
>
> (Mang, 2009, p. 5)

The notion of place has been variously part of architectural discourse since Vitruvius over two thousand years ago. The modernist movement broke with this understanding and replaced the significance of place with the more anonymous and abstract notion of space. Leatherbarrow (2009) presents that, in modernist theory, 'space was presented as the all-embracing framework of every particular circumstance, the unlimited container of all possible contents' and 'possessing a selfsameness congenial to intellectual mastery because of the conceptual character of its attributes'. By contrast, he suggests, the 'topography in which buildings perform' is '[p]olytropic, heterogeneous, and concrete, it regions contrast, conflict, and sometimes converse with one another' (p. 63).

During the 1960s and 1970s bioclimatic design and bioregionalism emerged as powerful notions to re-establish connection to place. Bioregionalism, for example, was committed to developing communities integrated with their surrounding ecosystems. Rather than legally defined regions, bioregionalism considered geographical province with a marked ecological and often cultural unity, often demarked by the watersheds of major river systems. What distinguished bioregionalism from other movements and theories was its firm base in the right of a group to self-determination and decision-making. But the greatest challenge of bioregionalism was:

> the crucial and perhaps only and all-encompassing task of understanding place, the immediate specific place where we live.
>
> (Sale, 1985, p. 42)

Breaking with the modern movement tradition in an attempt to reconnect with the emphasis on the specificity of place, 'regionalism', for example, was posited within mainstream architectural discourse as a potential remedy to the 'homogeneity and mediocrity of the current built environment' (Buchanan, 1983, 1984). In 'Towards a critical regionalism: six points for an architecture of resistance' (1983), Frampton laid down criteria deemed relevant to a regionalist architecture and attempted to focus the architectural debate in the notion of 'place'. 'Critical regionalism' was offered as a:

> strategy to mediate the impact of universal civilization with elements derived indirectly from the peculiarities of a particular place.

Mang and Reed illustrate how the concept of place is used in regenerative design and development as a:

> coalescing context [in that] it serves as the basis for illuminating what has shared meaning for all human and natural stakeholders, bigger than any one issue or cause, and thereby for discovering how a project can become truly meaningful.
>
> (p. 28).

A key distinction exists between green design and regenerative design with respect to place. Most green assessment tools have wrestled with accommodating regional distinctions and cultural differences as they are increasingly deployed outside their countries of origin. Being largely technocratic and conceived as a generic, top-down approach, they typically lack the specificity and social–ecological engagement central to a regenerative approach. The need for discrete performance criteria in green assessment methods also carries the potential consequence of fragmentation. Regenerative design and development, by contrast, seeks understanding of whole systems. Mang and Reed emphasize the potency of using the 'story of place', together with and 'pattern literacy', as a means of providing:

> a coherent organization of information, and the relationships and connections between discrete pieces of information and different types of information

and wherein an

> underlying narrative structure enables relating this information and these relationships and

> connections in a way that reveals a holistic, understandable picture.
>
> (pp. 29–30)

The re-emergence of the notion of place is clearly not confined to architecture and may also be a reaction and manifestation of people wanting to reclaim more control over their lives. Localism, for example, supports local production and consumption of goods, local control of government, and promotion of local history, local culture and local identity. Which aspects, and their extent, can be re-established and maintained at a local level and which remain within the domain of national and global production, trade and exchange, will clearly evolve according to the constraints and opportunities afforded by place. After an alarming characterization of America's decline, Seth (2011) emphasizes the need for efforts aimed at 'transformative change' that can lead to:

> a new operating system that routinely delivers good results for people and planet at home and around the world.

As a spur to such change, he suggests that the current decline will 'progressively delegitimize the current order' and thereby create the context for widespread demand for major change – something that is already currently underway as evidenced in numerous, mostly local initiatives.

While proponents of regenerative design emphasize place as a starting point and major focus of design, exploring and understanding the ecological and other systems for the broader region in which the project is situated clearly also offers potential value for design. What, for example, are the ecological and other physical assets? What are the ecological and physical constraints? What are the ecological services offered by the place – to adjacent regions and the biosphere, to other species, to humanity? While current design may have some familiarity and engagement with some aspects of place and may readily extend their commitment to place-specific approaches, it typically has little, if any, understanding of the larger ecological and social systems that are the longest lasting features of the physical environment and set the context for future long-term possibilities. Pedersen-Zari argues that regenerative developments 'cannot exist in isolation from their larger surrounding contexts' with the implication that:

> [there is] a need to understand ecosystem services at a larger scale (city, region, or ecosystem boundary) when devising goals and targets for individual buildings or small developments.
>
> (p. 62)

As with the need for both green and regenerative approaches, both scales of understanding are valuable and necessary.

Planning processes, and to a lesser extent, building design have increasing recognized the importance of engaging stakeholder input. Papers by Mang and Reed and by Hoxie *et al*. emphasize how regenerative design maintains and solidifies the need to create 'common ground' with diverse stakeholders and the potential that the regenerative development process holds in this regard. But most significant is the garnering of stakeholder engagement over the long-term. Here, Mang and Reed make a critically important distinction between regenerative 'design' and regenerative 'development'. While regenerative design builds the regenerative, self-renewing capacities of designed and natural systems (the designed interventions), regenerative development creates the conditions necessary for its sustained, positive evolution. Regenerative development and design, they suggest, 'does not end with the delivery of the final drawings and approvals, or even with construction of a project' but design responsibilities include:

> putting in place, during the design and development process, what is required to ensure that the ongoing regenerative capacity of the project, and the people who inhabit and manage it, is sustained through time.

This form of active and reflective stewardship builds the capacities of people to design, create, operate and evolve regenerative socio-ecological systems in their place.

While the thinking and aspirations of regenerative design and development is finding increasing interest, the papers herein collectively acknowledge it as an emerging influence on design and not yet sufficiently mature to grasp its full assimilation and consequence. The case studies presented in the paper by Hoxie *et al*. are presented as 'stories of place' showing the unique path that each community had taken to 'discover and develop their regenerative capacity'. These projects, as with those included in Mang and Reed's paper are almost exclusively non-urban, set within relatively coherent community contexts and with greater access to natural amenity. It remains unclear at this time how the notion of 'place' and the regenerative approach might accommodate densely urban settings with more complex and diversified communities and obliterated natural amenity.

While the aspirations and key principles of regenerative design can be readily understood, its operation and practice are less clear. With the new emphasis to design, new tools emerge to begin to represent the key characteristics and assist practitioners and stakeholders. Cole's paper characterizes the differences between green, sustainable and regenerative design and the tools and frameworks used to support them. More significantly, the paper characterizing the type of discussions that these three approaches generate

amongst the design team and between the design team and their clients in terms of strengthening an understanding of natural systems. Papers by Svec *et al.*, Plaut *et al.* and Cole *et al.* provide examples of some of the emerging regenerative design support tools and frameworks. These are qualitatively different from those for green design assessment tools. Green building assessment systems were conceived to provide a measure of performance but are also used to guide design by communicating what are deemed priority environmental issues. Plaut *et al.* argue that current green building tools 'offer little guidance in the way of guiding people through the creation, implementation, and operation of projects' and by focusing on 'measuring the performance of an end result or product' can be described as 'product-based'. By contrast, their LENSES and the other regenerative frameworks presented in the special issue are best described as what Plaut *et al.* call 'process-based' and are primarily directed at guiding design. Moreover, whereas the product-based tools keep individual environmental performance requirements discrete, the graphic organization of the emerging regenerative design tools expand the issues to include social, cultural, economic and ecological systems and processes but also emphasizes the relationship between them. In short, they accept the built environment as a complex socio-ecological system and attempt to offer guidance to designers and other stakeholders in situating projects within it.

Within the following papers, there are compelling arguments regarding the need to change current practice. But fundamental shifts cannot be readily or quickly assimilated within the design and production of buildings. Tschumi (1988) suggests that:

> Architectural and philosophical concepts do not disappear overnight … ruptures always occur within an old fabric which is constantly dismantled and dislocated in such a way that its ruptures lead to new concepts or structures.
>
> (p. 35)

This implies that new environmental theories, emphases and strategies will only be assimilated partially and selectively within an existing design context – the extent of which will vary depending of a firm's capability (small or large practice), experience in green design, etc. Within the context of this special issue, this means that not only are elements of green and regenerative design both necessary to support a healthy socio-ecological system but that practices are likely to coexist for some time.

This special issue raises a host of questions for research, policy and practice – many related to accepting uncertainty, longer timeframes of engagement, and systems thinking. It is clear that regenerative design and development are emerging notions with currently very few proponents and very few built projects to illustrate their consequence and transformative capability. Whether realized or not, current green practice and environmental policy is premised on measurable performance targets – on perceived certainty in the outcome. While green design, for example, can offer a LEED or BREEAM rating as a measure of performance, regenerative design will not be able to give such a declaration. As such, this will require a qualitatively different type of acceptance by clients and stakeholders of a building's current and potential merits. The benefits of regenerative design and development cannot be fully understood at the completion of a project – it will take considerable time before the necessary sustained engagement and stewardship can be gauged in a culture that is currently impatient and short-sighted. Brand (1999) emphasized that the:

> slow, inexorable pace of ecological and climatic cycles and lag times bear no relation to the hasty cycles and lag times of human attention, decision, and action

and that the:

> ever hastier decisions and actions do not respond to our long term understanding or to the gravity of responsibility we bear.

In contrast to the fact that nearly half of current ecological research spans only one year, he noted that the majority of the significant natural and cultural phenomena show long trends that are not measured or even noticed without doing extremely 'patient science'. Can clients accept longer timeframes integral to regenerative design and development to judge success? Can research be formulated and supported to understand complex, cross-disciplinary issues and sustain this over the long-term?

Current practice remains primarily focused on individual buildings typically without acknowledging the larger system context; most research remains discipline-specific and the complex array of stakeholders associated with the production and use of buildings have a limited understanding of each other's particular motivations and drivers; and most agencies directly and indirectly shaping environmental policy operate largely independent of each other. While boundaries are indeed beginning to blur, will regenerative design and development accelerate the development of the necessary systems-thinking, shared vision, shared ownership and shared responsibility?

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