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Mark Wigley  
Fabiola López-Durán  
Nikki Moore

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NOVEMBER/DECEMBER 2010  
PROFILE NO 208  
GUEST-EDITED BY LYDIA KALLIPOLITI





ARCHITECTURAL DESIGN

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LYDIA KALLIPOLITI

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# ECOREDUX

DESIGN REMEDIES FOR  
AN AILING PLANET

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# ECOREDUX: DESIGN REMEDIES FOR AN AILING PLANET

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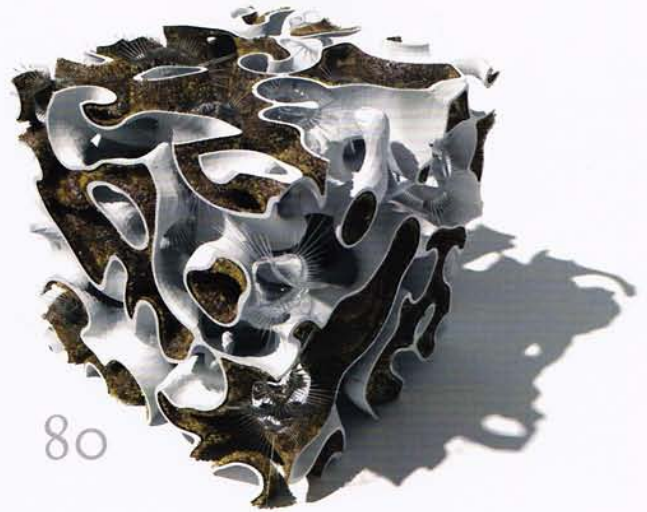
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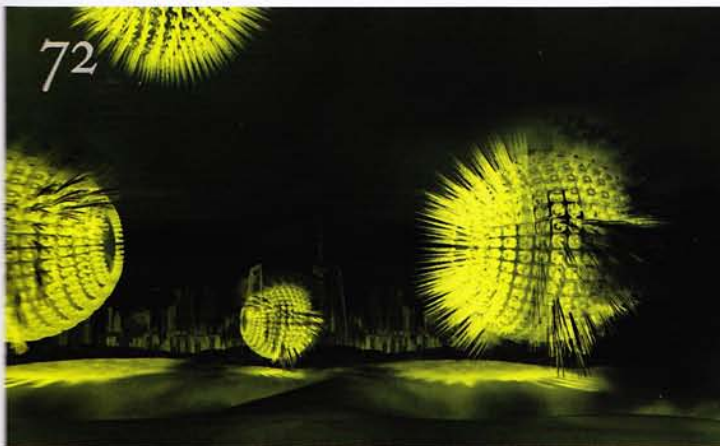
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ecologies of excess.*

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**Mitchell Joachim**, is a leader in ecological design and urbanism. He is a co-founder of Terreform ONE and Terrefuge. He earned his PhD at MIT, his MAUD at Harvard and MArch at Columbia. He was formerly an architect at Gehry Partners and Pei Cobb Freed. He has been awarded fellowships at Moshe Safdie, MIT Martin Society and TED2010, and won the History Channel Infiniti Award, *Time* Magazine Best Invention of the Year 2007, and the Zumtobel Group Award for Sustainability Research. He was chosen by *Wired* magazine for 'The 2008 Smart List: 15 People the Next President Should Listen To'. He is the Frank Gehry International Visiting Chair in Architectural Design at the University of Toronto.

**Nikki Moore** is a writer, a PhD candidate in philosophy at the European Graduate School in Saas-Fee, Switzerland, and a SMArchS graduate from MIT, 2005. She is currently the Words and Life Sciences editor for W5RAn. Her current research focuses on 20th-century formulations of community, nature and sustainability.

**François Roche, Stéphanie Lavaux, Toshikatsi Kiuchi and Stephan Henrich** work simultaneously through the architectural practice R&Sie(n) and the new-territories research organisation ([www.new-territories.com](http://www.new-territories.com)). The group also leads architectural research labs such as the Advanced Studio at Colombia University GSAPP in New York. Among the teaching positions held by R&Sie(n) and François Roche over the last decade are guest professor at the Bartlett School of Architecture, London (2000), the Vienna TU (2001), Barcelona ESARQ (2003–4), Paris ESA (2005), the University of Pennsylvania, Philadelphia (2006), Angewandte, Vienna (2008), USC–Los Angeles (2009) and, since 2006, at Columbia. Their architectural designs have been shown at Columbia University, UCLA, the ICA, Mori Art Museum, Centre Pompidou, Musée d'Art Moderne, Tate Modern and Orléans/Archilab. Work by R&Sie(n) was selected for exhibition in the French Pavilion at the Venice Architecture Biennales of 1990, 1996, 2000 and 2002, and for the international section in 2000, 2004 and 2008. Their work has also been selected for the International Pavilion in September 2010.

**Rafi Segal** is a practising architect and a writer. His work includes the Palmach History Museum, designed with Zvi Hecker and built in Tel-Aviv (1999), and Villa 003 of the ORDOS100 project currently under construction in Inner Mongolia, China. He was guest-editor (with Els Verbakel) of *∞ Cities of Dispersal* (2008), and co-author of *Territories: Islands, Camps and Other States of Utopia* (Walther König, 2003) and *A Civilian Occupation: The Politics of Israeli Architecture* (Verso, Babel, 2003), which gained extensive recognition and led to a series of exhibitions at Storefront, New

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**Alexandros Tsamis** ([www.digitalgraft.com](http://www.digitalgraft.com)) is a practising architect-engineer, currently enrolled in the PhD programme in design and computation at MIT. He is a co-founder of SPARC ([www.sparc-lab.com](http://www.sparc-lab.com)), a design-research laboratory dedicated to the design of smart/responsive environments. He was a visiting professor at the Knowlton School of Architecture, Ohio State University (2008–9) and a lecturer at the MIT Department of Architecture (2004–7). His work has been presented at MIT's 'Non-Standard Praxis' digital design conference (2004) and Harvard's 'Critical Digital' conference (2008).

**Eric Vergne**, of Anonymous is the founder and member of the Oakland, California-based design cooperative that seeks to liberate the studio from client and economic constraints through cultivating exotic plants and ecologies. Their work is not only supported by the ecologies they create, but is a muse for instillations and hypothetical projects that investigate the potential for sustainable technologies to transform how people think and live at the deepest social and cultural significance. The work ranges from hypothetical future-oriented projects to guerilla urban intervention.

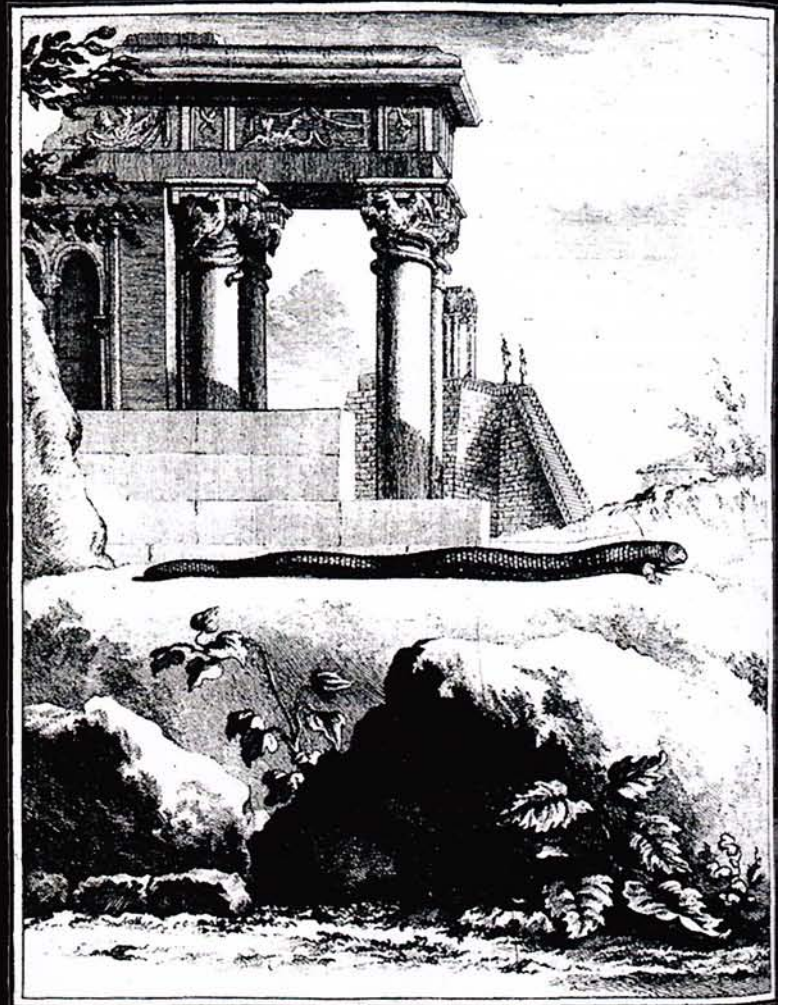
**Anthony Vidler** is a historian and critic of modern and contemporary architecture, specialising in French architecture from the Enlightenment to the present. Since teaching at Princeton and UCLA, he has served as Dean of the Irwin S. Chanin School of the Cooper Union since 2002. He has received awards from the Guggenheim Foundation and the National Endowment for the Humanities. His publications include *The Architectural Uncanny: Essays in the Modern Unhomely* (MIT Press, 1992), *The Writing of the Walls: Architectural Theory in the Late Enlightenment* (Princeton Architectural Press, 1996), *Antoine Grumbach* (Centre Pompidou, 1998), *Warped Space: Architecture and Anxiety in Modern Culture* (MIT Press, 2002) and *Claude-Nicolas Ledoux: Architecture and Social Reform at the End of the Ancien Regime* (Birkhauser, 2006).

**Mark Wigley** is Dean of Columbia University's Graduate School of Architecture, Planning and Preservation. He is the author of *The Architecture of Deconstruction: Derrida's Haunt* (MIT Press, 1993), *White Walls, Designer Dresses: The Fashioning of Modern Architecture* (MIT Press, 1995) and *Constant's New Babylon: The Hyper-Architecture of Desire* (010 Publishers, 1998). He co-edited, with Catherine de Zegher, *The Activist Drawing: Retracing Situationist Architectures from Constant's New Babylon to Beyond* (MIT Press, 2001). He has curated exhibitions at MoMA in New York, the Witte de With in Rotterdam, the Drawing Center in New York and the CCA in Montreal.

*Fabiola López-Durán  
Nikki Moore*

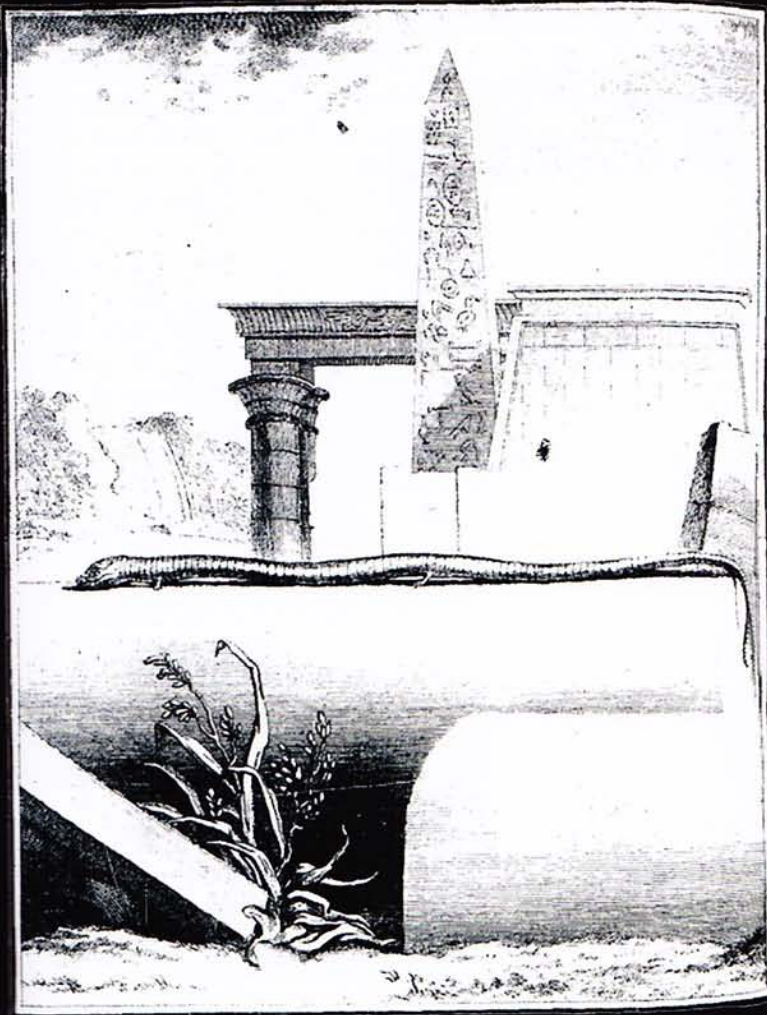
# (UT)OPIATES RETHINKING NATURE

Much of what is currently regarded as 'green' is predicated on a pre-modern, even Romantic, notion of nature; with sustainable design often overtly seeking to readdress the balance in nature by countering man's destructive forces. Here, **Fabiola López-Durán and Nikki Moore** pursue a more nuanced view of sustainability and architecture through a lineage of ideas, embedded within Lamarckian eugenics – the early 20th-century movement that sought the advancement of the human race through the transformation of the environment.



Bernard-Germain-Étienne de La Cépède, *Le Cannelé* and *Le Chalcide*, Plates XLL and PLXXXII from *Histoire naturelle des quadrupèdes ovipares et des serpents*, Vol I, in Georges Leclerc Buffon, *Histoire naturelle, générale et particulière*, 1749–89

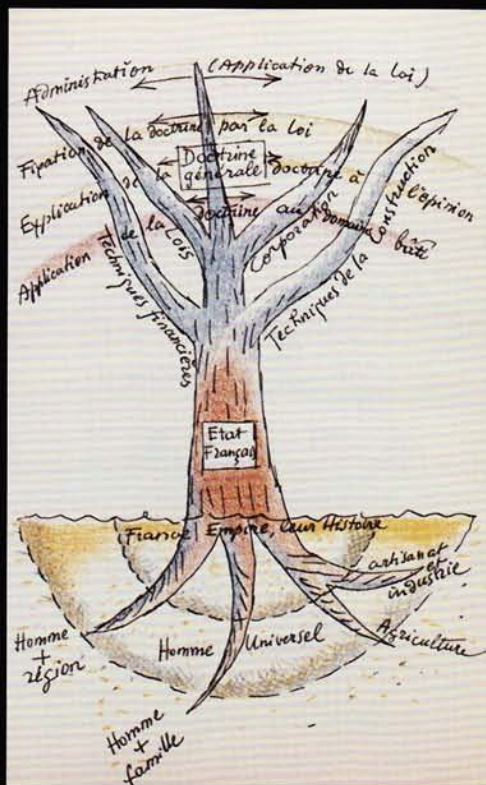
These two reptiles, portrayed by de La Cépède, illustrate the impact of the environment on species development. *Le Chalcide*, living in the 'right' classical environment, represents the original type, while *Le Cannelé*, living in the 'new' world, represents the degenerated species.



From 'green architecture' inspired by Gaia theory to sustainability management through LEED certification, it is clear that the discourse around architectural sustainability today hails from a premodern notion of nature. Aiming towards balance, harmony and health, this premodern, even romantic, understanding assumes a healable and – when properly managed – harmonic interaction between an organism and its environment. Yet, unknowingly or not, this approach dismisses a pressing body of biological and evolutionary knowledge built from the works of the French naturalist Georges Leclerc Buffon (1707–88), his disciple Jean Baptiste Lamarck (1744–1829), Charles Darwin (1809–82) and others.

As Buffon, Lamarck and Darwin understood, organisms and their environments are in a constant struggle for survival and it is this very struggle, and not the management thereof, that makes change and growth possible. To this end, the aim here is to uncover a travelogue of ideas, embedded within Lamarckian eugenics – the early 20th-century movement that sought the social and biological 'improvement' of the human race through the transformation of the environment – that moved towards a new form of humanism called sustainability which, through architecture, integrates ecology, technology and managerial politics. The travelogue begins with the 19th-century biological understanding of the term '*milieu*' and ends with the 20th-century architectural notion of '*anthropogeographie*' to contribute to a more nuanced view of the contemporary alliance between sustainability and architecture. In doing so, it demonstrates how architecture and urbanism, when seduced by these modern utopian projects, became willing technological devices contributing to the normative project of modernity.





## Milieu

The notion of *milieu* was first introduced by Sir Isaac Newton to the field of physics, but the term itself, in its mechanical meaning, first appeared in the mid-18th century in Denis Diderot and d'Alembert's *Encyclopédie*.<sup>1</sup> Under an entry of its own, *milieu* simply signified material spaces wherein bodies could move. Drawing from Newton, Buffon depicted this notion in a series of prints published in his *Histoire naturelle, générale et particulière* (1749–89), completed by Bernard-Germain-Étienne de La Cépède (1788–90).<sup>2</sup> One of the prints portrays a bipedal reptile purportedly found in Mexico. The amphibian, named 'Le Cannelé', with a serpentine body, an undifferentiated head and two short legs, divides the illustration into two fairly equal parts, drawing a horizontal line between 'pure nature' and the artifice of the built environment. This depiction may seem harmless until one considers 'Le Chalcidé', the archetypal amphibian native to the Mediterranean region to which *Le Cannelé* is compared.<sup>3</sup>

In contrast to *Le Cannelé*, *Le Chalcidé* is given as the normal type: it is a longer animal with its head differentiated from the body and four legs instead of two, placed not on the natural ground but over a fragment of a column of antiquity. Furthermore, in both images it is the background, not the foreground, which predominates. While *Le Cannelé* is drawn in front of an eclectic temple, a pre-Hispanic monument and the roof of a more modest building in the New World, *Le Chalcidé* is drawn residing in the 'right' environment amid Old World columns and obelisks. In this classic and 'civilised' context, *Le Chalcidé* is depicted as the less altered and more originary manifestation of the species. Through these illustrations, it seems Buffon's understanding of *milieu* forecasts what Michel Foucault said in one of his lectures at the College of France in 1978, the environment as *milieu* is not only constituted by 'natural givens' such as climate, trees, mountains and rivers, but by 'artificial givens', as in

Le Corbusier, *Arbre domaine bâti* (*The Tree of the Built Domain*), 1942  
Embedded in the ideology of progress (efficiency and production) and drawing on the two tenets of Lamarckian eugenics (heredity and milieu), Le Corbusier emphasises the inseparable roles of architecture and the state in this tree diagram, drawn for *La maison des hommes*.

architecture, engineered infrastructure and the agglomeration of individuals.<sup>4</sup> For Foucault, the *milieu* is in fact a 'field of intervention' where population change is the target.<sup>5</sup>

From the field of mechanics, Lamarck, drawing precisely from Buffon's work, imported the notion and the term *milieu* into the newly emerging field of biology. There it became a medium, not just a mechanism, wherein an organism transforms and is transformed by its environment, in a constant process of adaptation.<sup>6</sup> From Lamarck, *milieu*, as a relational system, continued to migrate: in the 19th century it moved to sociology and geography, then, at the beginning of the 20th century it entered into dialogues between urbanism and eugenics, and now it persists in the field of architecture, at the turn of the 21st century, in its global fixation on sustainability.

### *Anthropogeographie*

When formulating his notion of *milieu*, it is important to note that Buffon combined Newton's mechanical worldview and a specific French tradition of understanding geography, that of the so-called 'anthropogeographers'. Derived from Hippocrates and all through the work of Montesquieu, *anthropogeographie* – the study of man in his relation to the *milieu* – sought to understand 'how physical and biotic conditions were reflected in mankind's social life'.<sup>7</sup> What is thrown into relief by the anthropogeographers is the position of the human being, which is sometimes identified with nature and at other times, even simultaneously, objectified. In the hands of the 'expert' – a role played by physicians, social scientists, geographers, architects and other technocrats – not only plants and animals, but also the human becomes a malleable entity capable of being transformed together with the environment. No one understood this better than the Lamarckian eugenists, who hoped to use both heredity and *milieu* to manipulate and transform nature and the human species to their own ideals.

In the 1940s, Alexis Carrel, the French eugenicist and Nobel Laureate in medicine,

created the French Foundation for the Study of Human Problems and charged it with a dual mission: first, to study 'all possible means of safeguarding, improving and developing the French population', and second, to develop the 'science of man'.<sup>8</sup> The Carrel Foundation's reach extended from public health initiatives including the invention of 'prenuptial certificates' – which authorised a biological examination of potential spouses to determine their fitness for marriage – to the 'scholars book', implemented to record and classify children according to their academic performance. In addition, housing initiatives and urban planning were singled out as modes of effecting the 'improvement' of the French population. To this end, many important representatives of French society joined Carrel's amply funded initiative, and despite the foundation's very short life span, its accomplishments were extraordinary. Among its most notable members: Le Corbusier.

Le Corbusier, as well as other modern French architects, looked to the tradition of *anthropogeographie* as a way to re-establish the balance between man and environment. In his 1942 book *La maison des hommes* (*The Home of Man*), written during his time at Vichy and in collaboration with the physician François de Pierrefeu, Le Corbusier included a section on *anthropogeographie*, 'the science of sciences, for whoever seeks to work in harmony with the gods of the earth'.<sup>9</sup> It seems that Le Corbusier visualised and intertwined the initiatives of the Carrel Foundation into his visions for equilibrium between geography and man's activities: to be exercised through the domain of architecture.

To articulate this vision, Le Corbusier produced a tree diagram (1942) illustrating the doctrine and function of the one he called the architect-law giver.<sup>10</sup> Though drawn as a natural entity, the diagram creates a map for the agency of the French state. Three roots come from the trunk of this state: the left root represents the man and his immediate environment, the region. The middle root represents the man and his

social structure, the family. And finally the right root represents the cultivation of land beside trade and craft. This triad links *milieu*, reproduction and production at the base of the built domain. The central bough of the tree, the general 'doctrine of the built domain', sprouts into four political branches: those of law, financial techniques, construction and corporation. Le Corbusier calls this the 'science of living', the way towards 'knowing how to live', which includes applying the doctrine, explaining it through spoken word and media, fixing it by law and finally administrating 'the built domain' through regulations 'adapted to the many aspects of human geography and demography'.<sup>11</sup>

The general resonance of eugenicist ideas, and particularly those of Carrel in Le Corbusier's construction of a doctrine for the built domain, is striking and not coincidental. During the summer of 1936, while giving lectures in Rio de Janeiro, Le Corbusier was reading Alexis Carrel's bestseller *L'homme, cet inconnu* (*Man, the Unknown*).<sup>12</sup> For the very first of six lectures delivered in Rio de Janeiro, Le Corbusier clearly identified with Carrel's ideas and even mused about the possibility of materialising those ideas in his own work. Evoking Carrel's book, a doctrinarian compendium that advocated the implementation of a regime based on eugenic measures and practices, Le Corbusier commented to his architectural audience:

Plon, an editor who published my book on North America, welcomes at this time the success of his latest book: *Man, The Unknown* by Dr. Carrel. Write, he told me, a book that will be an echo of that one; I will do it with pleasure: the man and his shell, in other words, the house in which a man is obliged to pass a great portion of his life. [The house] must be completed and equipped with the essential joys, which can be defined as psycho-physiological.<sup>13</sup>

It is clear that Le Corbusier was beginning to work out what would later become his new Plon book, *La maison des hommes*, echoing Carrel's project for the remaking of society. 'It is in this book that Le Corbusier provides a clear explanation for how this process of remaking life is completely altered by how humans are housed, whether in the single domestic house, the city at large, the countryside, or the wider metropole.'<sup>14</sup> This project becomes clearer still in a small sketch he drew while preparing his talks in Rio. This very significant sketch on cardboard places the image of a man in a horizontal position as the base for his notes:

'Acheter livre Carrel' is the last line of this cardboard of notes, which begins with the word 'Castello' followed by the name 'Lucio Costa,' the phrases 'pedro aller police' and 'Castello couïts clichés,' and the name 'Carlos Porto.' This list of names scribbled on a piece of cardboard brings together the name of the mountain – Morro do Castello – that, in 1922 for hygienic and eugenic reasons, was eliminated from the urban topography of Rio de Janeiro; the name of Alexis Carrel, (...) the name of Lucio Costa, the visionary architect who designed the new capital of Brazil, and the representation of a man, a simple man, who would become the object of transformation for both Carrel and Le Corbusier.<sup>15</sup>

What made Le Corbusier think of Carrel while thinking of Rio de Janeiro? It is more than a coincidence that the word 'Castello' appears first on the cardboard. Besides being the name of Rio's eradicated mountain (the elimination of which displaced hundreds of 'undesirable' inhabitants), Castello was the name given to the esplanade that remained after this devastation, as well as the name of the epicentre of one of Rio's masterplans. It was also the popular name of the new building for the Ministry of Health and Education (1935–45) – designed

in collaboration by, primarily, Lucio Costa and Le Corbusier. Linking the dramatic transformation of the urban territory and topography of Rio de Janeiro with the name of the architect, who some years later would be behind the extraordinary construction of the new capital of Brazil, to Carrel's vision for the remaking of society, Le Corbusier, on one piece of cardboard, distilled and concretised one of the most basic and accepted rationales of modernity: change the environment, change the man.

#### Sustainability

Through this normative rationale, we are back to the biological notion of *milieu* as that medium through which change occurs and, at once, the commonplace understanding that man is a product of his environment. Yet while Le Corbusier, like modern sustainability proponents, sought to construct environments and structures to induce predictable and manageable change, the lineage from Buffon to Lamarck to Darwin reminds us that it is not through utopian visions of uniform populations, but by antagonism, that change occurs. In fact, the 18th-century French pathologist and physiologist Xavier Bichat defined life as 'the ensemble of functions that resist death', and Lamarck added that 'life resists solely by deforming itself in order to survive'.<sup>16</sup>

Between Bichat and Lamarck's understanding of life and the etymology of the word 'sustainability' are several poignant contrasts. The word 'sustain', from the latin *sub-tenere* meaning 'to uphold', has a certain passive connotation, implying 'stability, persistence and balance'. Even earlier 15th-century definitions connote something 'capable of being borne or endured; supportable, bearable', hinting at an even more extreme passivity. Within the modern ideology of progress, the word sustainable accrued a more active sense, paradoxically referring to the maintenance of 'a process which is being upheld or defended at the same time as it implies movement and improvement'.<sup>17</sup> Here, sustainable and development came

#### Le Corbusier, *Note de voyage*, undated

This sketch, drawn by Le Corbusier in preparation for his 1936 Rio de Janeiro talks, links his work, the urban transformation of Rio, to the utopian plans of French eugenicist Alexis Carrel. Carrel's bestseller, *L'Homme, cet inconnu* (1935), prescribes the implementation of a new social and pseudo-scientific regime based on eugenic practices aimed at suppressing certain human types towards the construction of an 'ideal' race.

together in a process of remaking the environment for 'the potential longevity of vital human ecological support systems such as the planet's climatic system, systems of agriculture, industry, forestry, fisheries and human communities in general'.<sup>18</sup> In this sense, sustainability is full environmental control: it is about the management of data and resources, in order to regulate all aspects of the environment. Inevitably, as Foucault illustrates, this regulatory role intertwines a play of powers between the government, the governed, and the *milieu*. Perhaps this is why, like few initiatives and discourses before it, sustainability has captured the 21st-century imagination: no matter what stance one takes on the Copenhagen talks or the Kyoto treaty, neither global poverty nor world hunger have garnered the clout, private funding and governmental support that sustainability initiatives are accruing.

Redefining the environment as a coupling of both the natural givens and the built domain, utopian modern projects, such as Lamarckian eugenics and sustainability, enable a certain and troubling convergence of resources and populations to emerge. In this sense, 'population appears therefore as a kind of thick natural phenomenon'.<sup>19</sup> Like mountains, rivers, forests and other natural resources, this now naturalised population is, under the auspices of those in power and their naturalising ideology, divorced from its identity as people, as individuals, becoming instead objects of manipulation. The first and most vulnerable to this process of naturalisation are of course the poor, the marginalised and the disenfranchised. The true challenge for architecture is to find the balance between resource preservation and diversity, while questioning normative mechanisms rather than propagating problematic utopian solutions. ◻

#### Notes

The title of this article was inspired by Slavoj Žižek's declaration that sustainability is the next opiate for the masses, second only to Marxism and Christianity. Our thanks to Mark Jarzombek, whose work has opened a way to rethinking sustainability.

1. Denis Diderot and Jean le Rond d'Alembert, *Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers*, Paris, 1751–72.
2. Georges-Louis Leclerc de Buffon, *Histoire naturelle, générale et particulière*, Imprimerie Royale (Paris), 1749–89. Written between 1749 and 1788, Buffon's main work was considered one of the 'intellectual monuments of the French Enlightenment', becoming the most widely read work on natural history in France. The work was completed between 1788 and 1790 with the addition of *Histoire naturelle des quadrupèdes ovipares et des serpents* by Buffon's collaborator Bernard-Germain-Étienne de La Cépède.
3. This comparison appears in the first volume of de La Cépède's *Histoire naturelle des quadrupèdes ovipares et des serpents*.
4. See Foucault's lecture of 11 January 1978, in Michel Foucault, *Security, Territory, Population: Lectures at the Collège de France 1977–1978*, Palgrave Macmillan (New York), 2007, pp 1–27.
5. *Ibid.*, p 21.
6. See Georges Canguilhem, *Knowledge of Life*, Fordham University Press (New York), 2008, pp 99–100.
7. Paul Rabinow, *French Modern: Norms and Forms of the Social Environment*, MIT Press (Cambridge, MA), 1989, p 196.
8. The Carrel Foundation, a pluridisciplinary centre with 300 researchers, was created by decree of the Vichy regime in 1941 and lasted until 1944. See Alain Drouard, 'About the Relationship Between Medicine and Social Sciences: the French Foundation for the Study of Human Problems or Carrel Foundation (1941–1945)', *Histoire des sciences médicales*, Vol 28, 1994, p 49.
9. Le Corbusier and François de Pierrefeu, *The Home of Man*, trans Eleanor Levieux, The Architectural Press (London), 1948, p 48.
10. *Ibid.*, p 44.
11. *Ibid.*, p 45.
12. The following note appears on the title page of Le Corbusier's own copy of Carrel's book, in Le Corbusier's handwriting: 'Été 1936, Rio + Le Piquey' ('Summer 1936, Rio + Le Piquey'). Alexis Carrel, *L'Homme, cet inconnu*, Plon (Paris), 1935.
13. Fabiola López-Dúran, *Eugenics in the Garden: Architecture, Medicine and Landscape from France to Latin America in the Early Twentieth Century*, forthcoming, 2012.
14. *Ibid.*
15. *Ibid.*
16. Rabinow, *op cit*, p 129.
17. Malgorzata Pankowska, 'Sustainability of Virtual Collaborative Networks', in Luis M Camarinha-Matos and Willy Picard (eds), *Pervasive Collaborative Networks: IFIP International Federation for Information Processing*, Springer (Boston, MA), 2008, p 85.
18. *Ibid.*
19. Michel Foucault, *Security, Territory, Population: Lectures at the Collège de France, 1977–1978*, trans Graham Burchell, Picador (New York), 2004, p 71.





ARCHITECTURAL DESIGN

## ECOREDUX: DESIGN REMEDIES FOR AN AILING PLANET

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This issue of  $\Delta$  explores the remarkable resurgence of ecological strategies in architectural imagination. As a symptom of a new sociopolitical reality inundated with environmental catastrophes, sudden climatic changes, garbage-packed metropolises and para-economies of nonrecyclable e-waste, environmental consciousness and the image of the earth re-emerges, after the 1960s, as an inevitable cultural armature for architects; now faced with the urgency to heal an ill-managed planet that is headed towards evolutionary bankruptcy. At present though, in a world that has suffered severe loss of resources, the new wave of ecological architecture is not solely directed to the ethics of the world's salvation, yet rather upraises as a psychospacial or mental position, fuelling a reality of change, motion and action. Coined as 'EcoRedux', this position differs from utopia in that it does not explicitly seek to be right; it recognises pollution and waste as generative potentials for design. In this sense, projects that may appear at first sight as science-fictional are not part of a foreign sphere, unassociated with the real, but an extrusion of our own realms and operations.



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