DESIGN WITH NATURE RECONSIDERED

THEN, NOW, AND LATER

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Introduction

Long before the recently coined epochal Anthropocene, architects, planners, and what today would be called environmentalists, wrote alarming and prescriptive screeds, intended to redirect the pace, character, and scale of how humankind was altering, not only the face of the planet through construction, but the deeper means by which the planet self-regulated. Their focus, while urban, was largely systemic in nature extending to large swaths of earthly regions, wrapped in the methods and nomenclature of the scientific method which, during and following the Second World War, was in ascendence.

Walter Gropius, the former Director of the Bauhaus at Dessau and then Chair of Harvard University's Harvard's Graduate School of Design (GSD), with Martin Wagner, published a disquieting article in *The Kenyon Review*, in 1943. Wagner (the article's first author) was hired by Gropius to teach city and regional planning soon after Gropius assumed the GSD's chairmanship. Wagner was a former urban planner for the City of Berlin where he was responsible for many realized housing projects. As German émigrés, writing about urban matters and resource conservation amidst the Second World War, one would have expected their subject to have been the future of European cities. It was, after all, the topic that provoked the French government to send Le Corbusier to the United States, in December, 1945, although the purposes of that fact-finding mission focused on the new and unprecedented infrastructural developments of the Tennessee Valley Authority (TVA), and its proto-Orwellian motto: "Man in harmony with nature" (Bacon 2015: 14). Rather, Gropius and Wagner wrote about dying American cities, which at the time of their writing, were still much as they had been before the war, albeit far busier owing to wartime production, yet untouched by a single hostile assault.

Gimlet-eyed in their assessment, writing during such U.S. federal efforts as Wartime Rationing of Food (May, 1942) and a Salvage for Victory Program (January, 1942), they argued that the United States needed to preserve its limited resources, not waste them on outdated notions of remaking hopelessly obsolete urban cores which suffered from "the disease of decentralization caused by the flight from the city" (Wagner and Gropius 1943: 12). It was not only useless, but irresponsible to waste limited resources attempting to remake these moribund city centres into something they could never be, nor serve the needs and desires of future generations (Wagner and Gropius 1943). For Gropius and Wagner, it was time to make new vibrant cities for a new generation and the new "Oil Age," served by the automobile and large trucks. The "deathly sick" urban core, a relic of the "Coal Age,"

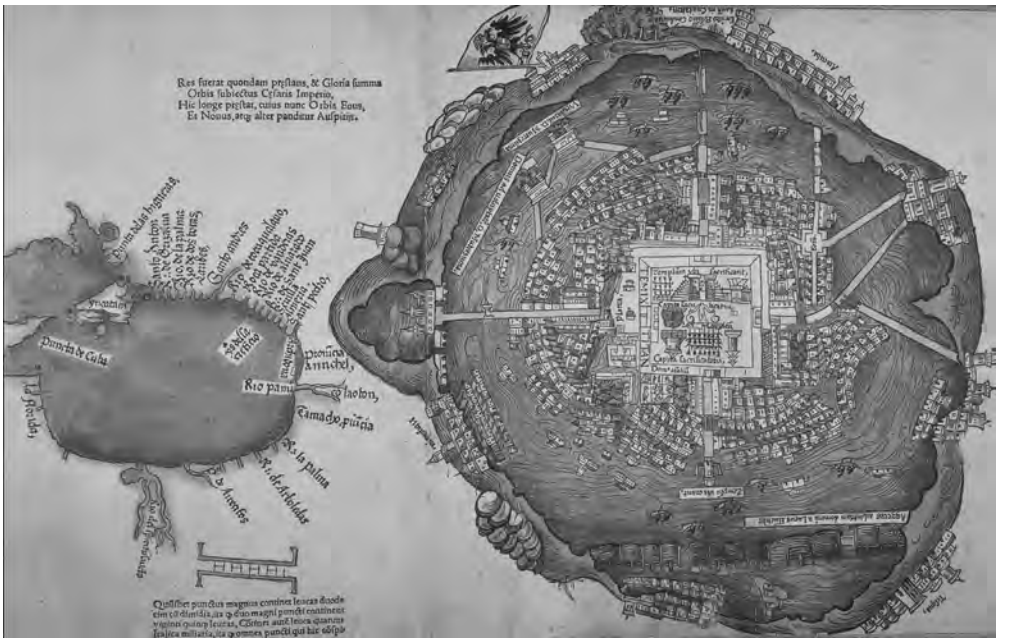

Figure 1.2.1 Frontispiece: Hernán Cortés, "Cortés' 1524 Map of Tenochtitlan."

Source: *Praeclara Ferdinādi Cortesii de Noua maris Oceani Hyspania narratio* (Nuremberg, Germany: Friedrich Peypus), 1524. Newberry Library, Chicago. Public Domain. Peypus's map for many, marks the start of the Anthropocene, as it is the first such document of the New World's geography, and its colonization.

was to be abandoned along with its crumbling railroad infrastructure, left to become something else entirely. Just what that was they left purposely vague. In retrospect, one has to wonder how such an audacious proposal was received.

That Wagner and Gropius chose *The Kenyon Review* was as much about the publication, as it was its audience. Rather than publishing in a planning or architectural journal, they chose one of the few American publications of the time known for its avant-garde ideas with a readership beyond the academy, that included future and current leaders in government and industry. Although largely unfamiliar to those in the design disciplines it was one of the most influential intellectual journals of the day. Edited by John Crowe Ransom, the titular leader of the New Criticism, published by Kenyon College in Ohio, it was one of the first American platforms for the new voices in poetry, literature, and literary criticism; Ford Madox Ford, Robert Graves, Flannery O'Connor, and Robert Penn Warren were frequent contributors. Gropius wanted to reach readers who made, or would make, decisions affecting design, not designers. This is just one of many lessons Ian L. McHarg learned outside the classroom from Wagner and Gropius. This chapter briefly situates *Design with Nature* among several post-war architectural treatises that preceded and influenced it, along with several key earlier precedents; explores its place in contemporary discourses, particularly in relation to its absence or misrepresentation; and why this should matter.

Survival

For many advocates of ecological design practices—an approach singularly associated with McHarg's compendium—his work seemed as if it had burst forth fully grown, absent precedent. Rich in personal anecdotes, detailed case studies, rigor, and analysis, it egregiously lacks attributions. If history

teaches us anything, it is that virgin births are the stuff of myth. As towering a figure as is McHarg, he too stood on the shoulders of others. This is not to diminish either his brilliance nor his originality; rather it is to better situate it within a larger discourse of which he was surely aware, during his schooling, and during his formative years teaching at the University of Pennsylvania's Graduate School of Fine Arts in Philadelphia. Indeed, if Gropius's and Wagner's critique of the American city, published in *The Kenyon Review*, seems to resonate at all with McHarg's core arguments in *Design with Nature*, it is not by coincidence. Soon after arriving at the GSD, Wagner became its most popular and dedicated teacher, influencing a wide array of future practitioners and politicians, including of David Wallace and McHarg, the future partners of Wallace, McHarg, Roberts, Todd of Philadelphia.

That McHarg should incorporate "survival" into the second chapter's title, "Sea and Survival," is telling. Once again, this is not new. In doing so McHarg is following in a tradition of post-nuclear architectural "treatises" by Richard Neutra, Eliel Saarinen (1948), Frank Lloyd Wright, Le Corbus-ier, and Walter Gropius—all of whom focused on the architect's task to help humanity survive itself. There was a commonly held visceral concern that while the Allies had won the war, we may have done so by losing humanity. John Hersey's *Hiroshima* (Hersey 1946) is perhaps the keenest example in the literature documenting the moment—the account of six survivors of the Enola Gay's dropping the first thermonuclear device on Hiroshima. By the time Richard Neutra publishes *Survival through Design*, less than a decade later, he was obsessed with the theme in relation to designing for biologi-cal organisms along with avoiding world-wide annihilation (Neutra 1954). He continues this theme throughout his career, most notably in *World and Dwelling* (Neutra 1962). Neutra toured Europe's major cities in 1948 writing about post-war reconstruction efforts for an American architectural journal, and went so far as to title his treatise, *Survival through Design*, in which, more than any archi-tect before or after, he spent a remarkable amount of time focusing on the management of human faeces. It is clear that from Le Corbusier's "City for 3 Million Inhabitants," and Frank Lloyd Wright's "Broadacre City," through Neutra, Gropius, and McHarg, there was nothing less than survival on the line, both humankind's and that of the planet, and not necessarily in that order.

Among the several books published during this period that set the stage for McHarg's *Design with Nature*, William Lescaze's, *On Being an Architect*, had a relatively short life-span owing to both its timing and content. Published the year after the United States officially declared war on Germany and Japan, much of the book is filled with what would have been, during peacetime, useful and practical advice for the un-indoctrinated on why and how one would choose architecture as a profession—and having done so, how to sustain one's practice. In contrast to the other texts to follow, Lescaze wrote before President Truman decided to incinerate Hiroshima and Nagasaki with Little Boy and Fat Man—names more appropriate for cartoon characters than nuclear bombs powered by uranium-235. Lescaze's penultimate chapter, written before the German Holocaust and the American unfettering of nuclear war, is an architectural call to arms, consistent with the country's recent entry into the World War.

> At the present moment a great number of architects, aged plus or minus forty, are made to feel that their usefulness to their country is less than that of an eighteen-year-old apprentice in a flying school. . . . It's a waste today, and it may become disastrous tomorrow [because] . . . building is the first operation in the production of munition, a fact which is being forcibly imposed upon us. Building is a war tool, too.
>
> *(Lescaze 1942: 255)*

Lescaze's jingoism notwithstanding, he, nor any American citizen could have known, that as *On Being an Architect* was being published, his architectural call to arms was already well underway. The exigencies of wartime required the Department of War to brutally expropriate 80,000 acres of Knox

and Anderson counties in East Tennessee for a massive building and research program heretofore unimagined. Then publicly referred to as "The Clinton Engineering Works," today we know it as Oak Ridge National Laboratory, a critical part of the Manhattan Project.

The Book

McHarg understood that timing is everything. *Design with Nature* (McHarg 1969) is more than an exemplar of the post-war period, during which quantification and the reduction of design into scientific systems of analysis, nascent in 20th-century modernism since the first Charter of the *Congress Internationale Architecture Moderne* (CIAM) 1928 was wholly and uncritically embraced in the spheres of planning, architecture, and landscape architecture. This system of systems came to full maturity at just the right time, during the height of the Vietnam War, and was published to coincide with the first moon landing by Apollo 11. The front of its dustjacket, tattooed with a spheric image of a grey atmosphere above a generic urban skyline rendered in chiaroscuro is its frontispiece (Figure 1.2.2); The back cover of the dust jacket sports the now-famous NASA image of earth—TVA's "Man in Harmony with Nature" whilst far outside the exosphere. One can almost hear the Coca-Cola theme song released in October, 1969, resonating in the exosphere; "I'd like to buy the world a Coke. . . . It's the real thing."

In part, because of McHarg's prose style, it can be erroneously discounted as the personal diary of an innovative landscape architect and teacher. It is, of course, much more. Akin to Robert Venturi's *Complexity and Contradiction in Architecture*, published three years earlier, McHarg speaks directly to his audience about what he does and does not like. Beginning with childhood stories, growing up 10 miles outside of Glasgow, *Design with Nature* is structured as a series of episodic narratives focus-ing on McHarg's projects and studies; the chatty, first-person prose testing the patience of many contemporary readers.

In "City and Countryside," the opening chapter, McHarg stakes his claim: "This book . . . is my investigation . . . into a design with nature: the place of nature in man's world, my search for a way of looking and a way of doing—a simple plan for man in nature" (McHarg: 1). Sounding more American Transcendentalist than Scottish Environmentalist, he continues: "This book is a personal testament to the power and importance of sun, moon, and stars, the changing of seasons, seedtime and harvest, clouds, rain and rivers, the oceans and the forests, the creatures and the herbs"

Figure 1.2.2 *Design with Nature* dust jacket from the 1969 first edition.

(McHarg: 5). It does not help matters that, with these first few words, McHarg makes a muddle of things; he conflates three distinct conditions fundamental to his enterprise: "design with nature"; "the place of nature in man's world"; and "man in nature."

It has long been accepted that the polymorphous idea of nature changes from epoch to epoch signalling both a reconfiguration of the relationship of humankind to its environ as well each epoch's idea of what constitutes the character of self. As early as 1935, A. O. Lovejoy et al. isolated 66 dif-ferent senses of the word in *A Documentary History of Primitivism and Related Ideas, Volume One: Primitivism and Related Ideas in Antiquity* (Lovejoy, et al.: 447–456). McHarg seems incomprehen-sibly unfamiliar with Lovejoy's work, along with R. G. Collingwood's seminal, *The Idea of Nature* (Collingwood 1945). But these are only two in a long line of sources egregiously absent from *Design with Nature*.

Towards the end of *Design with Nature*, in "Process and Form," McHarg looks inward using liter-ally microscopic imagery as a model for large-scale mediations of land forms—wholly the inverse of "Sea and Survival." The chapter is populated with photographic representations much indebted to Watson and Crick's discovery of the structure of DNA and essays published several years earlier by Gyorgy Kepes in a now-famous series of thematic books published by George Braziller. That McHarg was unfamiliar with these works seems all but impossible; that he found other sources for virtually identical imagery so as to avoid the taint of intellectual indebtedness is much more aligned with his authoritative persona, consistent with his ambivalence towards citing sources that may have informed his thinking.

Absent footnotes, bibliography, and useful captions, by today's standards *Design with Nature* is rife with plagiarism. For example, "The Plight," Chapter 3, has as its frontispiece an image straight out of Frank Lloyd Wright's *The Disappearing City* (1932)—a book that most certainly influenced Gropius's and Wagner's article no less than Wright's Martin House (as depicted in the Wasmuth Port-folio) influenced Gropius's and Adolf Meyer's design of the Deutscher Werkbund Pavilion, for the Cologne Exhibition, 1914. Central to the chapter (written at the nadir of American urban centres) is McHarg's loathing of the status of American city, akin to Gropius's and Wagner's argument, and Frank Lloyd Wright's, "Broadacre City;" They all share the same genetic code of the New Oil Age outlined in the *Kenyon* article. Culling images from Peter Blake's, *God's Own Junkyard: The Planned Deterioration of America's Landscape* (Blake 1964), McHarg editorializes absent any reference to Blake:

> You can confirm an urban destination from the increased shrillness of the neon shill, the diminished horizon, the loss of nature's companions until you are alone, with men, in the heart of the city, God's Junkyard—or should it be called Bedlam, for cacophony lives here.
> *(McHarg: 23)*

His penchant for pilfering the work of others notwithstanding, *Design with Nature* remains in the canon of environmental design and sustainable/regenerative design practices owing to his privileging "the ecological view" in regional, urban, and landscape design and his initiating a systemic methodology of thinking about how landscapes worked at the macro and micro scales, creating the theoretical substrate for what is called a performative landscape in the lexicon of the day.

While rhetorically a series of autobiographical testimonials and large-scale technocratic case studies, its opening and closing chapters reveal something more. "Sea and Survival" is a relatively small-scale case study with large-scale implications—the product of a Landscape Architecture studio McHarg directed at the University of Pennsylvania's Graduate School of Fine Arts. The models demonstrate ways to preserve coastal dunes following the infamous "Ash Wednesday Storm" (March 5–9, 1962) that obliterated much of the littoral edges of New Jersey and New York; a problem that has only become more keenly felt during the past two decades of climate change. It is with sad irony that we read his praise for the conservation work in the Netherlands, but the complete

lack of coastal management along the New Jersey Shore in the early 1960s—a problem that persists today unabated, a decade after Hurricane Sandy ravaged New Jersey's and New York's coastal towns (McHarg: 16). Indeed, writing in the December 02, 2021, edition of *The New York Times*, Michael Kimmelman adumbrated the decade-long community-engagement process of approving and imple-menting a design for reconstructing lower Manhattan after Hurricane Sandy. Originally intending to use an adaptable "sponge-like" system informed by Dutch hydrologists, the plan was scrapped under a new city administration in favour of an incomprehensibly old-school fixed-height beach-head against a continuously rising ocean (Kimmelman 2021).

The core of *Design with Nature*, its many well-mapped case studies notwithstanding, is a difficult balancing act. McHarg proposes that the longstanding anthropocentric view of Nature (which he severally traces back to *The Book of Genesis* in an obsessive Judeo-Christian manner) which requires the acquiescence of nature to human artifice, must be replaced by humankind "listening to nature"—ideally an equal weighting of the "anthropocentric" and "ecological views." Whether McHarg resolves this equation is another matter. Throughout *Design with Nature*, he jettisons the anthropocentric with withering pejoratives at every turn. Yet, in 1969, this was a novel proposition that captivated generations.

> The . . . Earth has been home for all . . . of its myriad inhabitants since the beginning of time. . . . Our phenomenal world contains our origins, our history, our milieu; it is our home. It is in this sense that ecology (derived from *oikos*) is the science of the home.
>
> *(McHarg: 29)*

There is a blindness, however, endemic to *Design with Nature* that makes it very much a work of its epoch: the uncritical embrace of all things scientific; the presumption that all things can be measured and that through measurement, all things may be understood. The other blindness is representational: the method of mapping and the presumption that anything that can be mapped can be controlled—clearly at odds with McHarg's Zen-based "listening to nature" but no less so than the TVA's "man in harmony with nature." The more one accepts inherent contradictions, the easier they are not to see.

Design with Nature has long been the wellspring of mapping techniques for landscape architects, urban designers, and planners; it is only in hindsight that its flaws are so readily registered. In its final chapter, "The City: Health and Pathology," McHarg's students map out a means for urban survival, and in so doing demonstrate the limits of their system, along with their own blindness as they presume their system an objective lens for collective vision.

McHarg and his GSFA students mapped the City of Philadelphia for a host of criteria, searching for the sources of its decrepitude. The many categories quantified included income, poverty, employment, density, and race. Yet, the study is blind to those parts of the city, most necrotic by McHarg's standards, which happened to be almost entirely populated by what were called negros at the time. Remarkably, four years after Lyndon Johnson signed the Voting Rights Act into law, in the City of Philadelphia, Blacks are absent as a singular race in McHarg's concluding study. Rather, they were lumped in with "non-whites." The terms Black, negro, African American, etc., are egregiously absent from an otherwise finely grained quantification of population centres occupied by German, Irish, Italian, Polish, and German ethnicities vis-à-vis clearly demarcated landmasses.

Digging Deeper

Christophe Girot rightly laments that our voices as residents and designers of the built environment have "become muted and overrun" by our own fascination with the "rational scientific language of the Information Age" (Girot 2021: 10). Certainly, neither *Design with Nature*, nor McHarg's

teaching, are solely responsible for landscape and urban design's current reliance on data systems and its lexicon. Looking back from beyond the exosphere, *Design with Nature* is part of a larger trend, not a singular sea change. Nonetheless, this work laid the groundwork for our current subservience and collusion with data collection and surveillance systems that has become so essential to our purview as spatial designers. The enduring role of McHarg's Suitability Map, for example—a method of survey, analysis, and design that remains a popular and useful tool today, albeit known by different names—has effectively reduced the value of design to one of efficacy, or the capacity to effect change in the world, vis-à-vis metrics of performance and influence.

During what for many might be called, with only mild hyperbole, the Age of McHarg, the gravitas of efficacy has increased disproportionately in relation to other means of valoris-ing design choices, largely owing of his method's easy virtue and its unintended consequence: encumbering the discipline's response to rapid urbanization amid increasing climate destabili-zation. Considering the widespread adoption of his stratagems and the often-under-criticized results of his tactics (see *Design with Nature Now,* for example), these comments require some unpacking of their own.

As a design objective, efficacy refers to a wide spectrum of attributes or positive outcomes, many of which are long-held tenets of good design. Projects that enable positive cultural change create new social interactions and access, generate new economic opportunities, and improve environmen-tal conditions. Anything from basic stormwater management to increased bio-diversification and carbon sequestration can be valued positively on the McHarg efficacy scale. These four basic tenets of good, efficacious design correspond—rather directly—to the four basic qualifications of "ecosys-tems services"—a method of environmental valorisation central to McHarg's ecological approach to design analysis and justification: provisions, support, culture and identity, and regulation. The con-cept of ecosystems services (originally coined "environmental services" in the 1970s) is a method of attributing value to ecosystems based on their ability to provide functions and products that benefit humans and general social welfare (Lele et al. 2013: 343). The difference between the two, ecosys-tem services and design efficacy, is that one asserts that ecosystems are themselves valuable and the other claims that the work of design is to direct environments, or ecosystems, towards improving the human condition—and that these improvements are due to the precise physical qualities of the design work itself. For example, while the TVA would claim the former, its continued existence, let along its founding, rested and rests on the latter. Few would argue that either of these concepts is incorrect or invaluable; one point of contention however, to which we ascribe is that design adds value beyond aesthetic identity. Moreover, the shaping of spatial and social dynamics is not some-thing that needs to be, nor can be wholly metricized—it is neither wholly determined by data, big or small, nor a simple function of data.

While McHarg's influence registers today severally, it is perhaps in the process of determining a site's suitability that his significance is most keenly evinced—what is included as a determinant and how each is weighted within the design process. For designers who consider their work an artistic practice, the McHargian deductive method of survey-analysis-design reduces a site to a set of metrics representative of the existing conditions proscribed within fixed boundaries. A wider more induc-tive approach draws in a larger, more conceptual notion of a site that allows less obvious patterns and characteristics to emerge within a design process which may both define and inscribe the site boundaries. Both methods have their values and limits. Yet, if these two positions are to enhance our understanding as designers, they must be situated in the complex history of site analysis, spatial design, and ecological practice—particularly in relation to the current culture of data-reliance and the fetishized production of mapping techniques as decorated information.

Architecture and landscape architecture each have their histories of uncritically engaging a range of cartographic methodologies to document and analyze a site's ecological, morphological, and social dynamics. Contemporary landscape architects often cite the work of the Prussian-born polymath

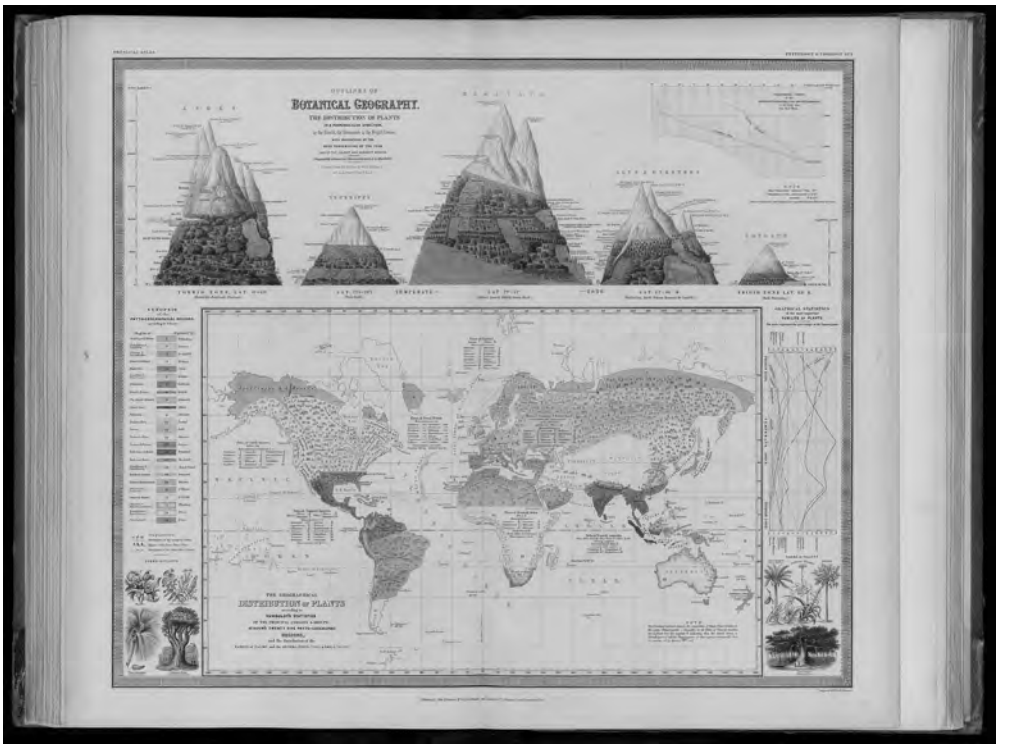

Figure 1.2.3 "Outlines of botanical geography" and "the geographical distribution of plants" engraved map and illustrations within one border with added colour (in the original) from Alexander Keith Johnston's *The Physical Atlas* (1848).

Source: Reproduced with the permission of the National Library of Scotland.

Alexander von Humboldt (1769–1859), who augmented his famously illuminating metrical representations of landscapes with empirical annotations (Figure 1.2.3).

Measurement and judgement combined to diminish personal bias, inherent in any depiction. In so doing, von Humboldt created an essential building block of the discipline's foundation, firmly establishing the enduring significance of cartographic methods of representation well beyond the realm of his chosen discipline, biogeography. The contours of von Humboldt's work, consequently, resonate well beyond the scholarly confines of 19-century cartographic studies, the bio-physical, or his contributions to the natural sciences (Figure 1.2.4). Similarly, von Humboldt's techniques are more than a matter of aesthetics; they grounded and conjoined the development of both landscape architecture and ecological practices into a theory of open systems analysis (Cannon 1978: 73; Fränzle 2001: 64). With its empirical foundations, the mapping and design methodologies employed by Ian McHarg reinscribed the mathematical language of open systems theory—first situated by von Humboldt—into contemporary landscape practice.

Through a process of simplification—bounding and abstraction—open systems theory relies on mathematical modelling techniques to understand and predict the behaviour of complex structures. The privileging of ecological systems within the practice is central to McHarg's legacy. Moreover, the study of ecological systems is one of a formulaic abstraction that flattens local variations into regional generalizations. In simple terms, humans (even ecological scientists) understand ecology in broad strokes that measure the health, function, and value of an environment against a baseline of quantifiable things; necessarily discounting the complexity of organic and inorganic beings and

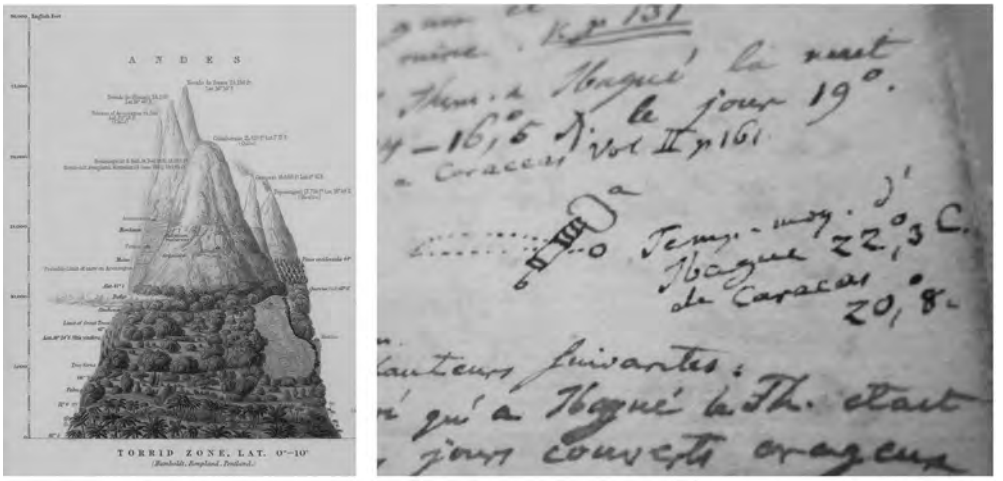

Figure 1.2.4 Excerpt from "Outlines of botanical geography" and "the geographical distribution of plants" engraved map and illustrations within one border with added colour from Johnston's *The Physical Atlas* (1848). This excerpt shows the incorporation of illustration and scientific measurements.

Source: Reproduced with the permission of the National Library of Scotland.

processes that are not visible, or countable. In *The Language of Landscape* (Spirn 2000), Anne Spirn points to three questions McHarg's legacy leaves critically unresolved for landscape practice—the inability to: "reconcile environmental values and human needs"; "give material form to ecological processes and values"; and "capture the impacts of local action and interaction at the regional scale" (114). For most designers, the creative process is rarely linear and often finds inspiration beyond the materiality and dynamics of the immediate site; allowing relations, interactions, and extractions—direct or indirect—to be drawn through one's study of the site. McHarg's empirical approach requires the precise opposite, attenuating the field of possibilities and scales of operation for design inquiry.

In recent decades, spatial design disciplines have been asked to engage in increasingly complex sites and issues (ranging from short-term disaster relief encampments to long-term climate change), often requiring urgent action; and to demonstrate the value of their contributions using quantifiable metrics to analyse collected data that speaks, nonetheless, of qualitative change. McHarg believed that scientifically grounded spatial reasoning, or design, would lead to a harmonious evolution between economics (a measure of human health and happiness) and ecology (Weller 2008: 259).

McHarg's *Design with Nature*, is a techno-utopian dreamscape of solutionism by way of, what was for the time, massive data collection and analysis. Under McHarg's direction, the discipline and profession of landscape architecture, principally through his work at the University of Pennsylvania's Graduate School of Fine Arts, and the Department of Landscape Architecture, which he founded, grew into a multidisciplinary endeavour. Increasingly important to this expanded project was a reliance on data collection and analysis as an operational strategy that was verifiable and repeatable. McHarg's method, operating under the guise of objective data collation and analysis, was a belief system that opened the path to finding THE correct answers to questions for healthy living, situated between built and naturally occurring systems. It is within this belief system that the concepts of "fitness" and "suitability" enabled landscape architects to claim that their design proposals were rationally grounded in an ecological practice akin to a science, not merely aesthetic preferences; enabling the practice to engage with increasingly larger spatial and environmental registers, from gardens and parks, to entire regions, ultimately opening the door to *le territoire* (Picon 1998).

In his "Introduction" to *Design with Nature Now*, Frederick Steiner, a former student of McHarg's in the early 1980s at Penn's Graduate School of Fine Arts and now dean of PennDesign, recognizes the inherent philosophical quandary McHarg created for himself with a singular understatement: "By making . . . nature . . . a higher authority . . . and reducing it to . . . data-driven positivism . . . McHarg was always going to get into philosophical trouble and attract criticism" (Steiner et al. 2019: 2–3). Steiner continues: "Had McHarg titled his book *Design with Landscape*, . . . and offered caveats . . . then accusations of hubris and artlessness . . . levelled at him could have been largely avoided" (Steiner et al. 2019: 3). Somehow, the entirety of McHarg's teaching career, not to mention the core argument and methodology of *Design with Nature*, suggest otherwise.

The "suitability analysis", or "layer-cake" method of mapping, is perhaps the most straightforward example of McHarg's use of data within spatial design and why Steiner's continuation of myth-making delimits rather than clarifies our understanding of McHarg's legacy. In retrospect, the layer-cake method is an oversimplified methodology of what was already an abstract theory of ecological systems. The suitability analysis layers ecosystems one atop another, along a linear conception of time and impact, within the value framework of the service industry. The result: if an assemblage of land, water, flora, and fauna is to hold value, by logical deduction, its destruction would also carry a cost. The layer-cake's cost-benefit framework, and the interdisciplinary negotiation that it required, provided the necessary shift towards urban-scale infrastructure to move landscape architecture away from artistic practice and into the semblance of a more scientific urbanism (Figure 1.2.5). While the conclusions it rendered may have been, quite often, over-stated, lacking the nuance required to more fully comprehend the subject matter, the methodology was highly teachable and transmissible—hence its widespread success.

Whether discussed as landscape urbanism, ecological urbanism, or projective ecologies, more recent theories about both the city and ecology as pluralistic, emergent constructs tend to negate the scientific certitude of McHarg's theory and methods. While McHarg's work was grounded in a version of ecological practice that prefaced its notion of harmonic equilibrium on the mathematical eradication of disturbance, landscape urbanism's view on ecology is formed around more open-ended processes of self-organization and indeterminacy—something much more akin to chaos theory than McHarg could have rationalized or would have entertained.

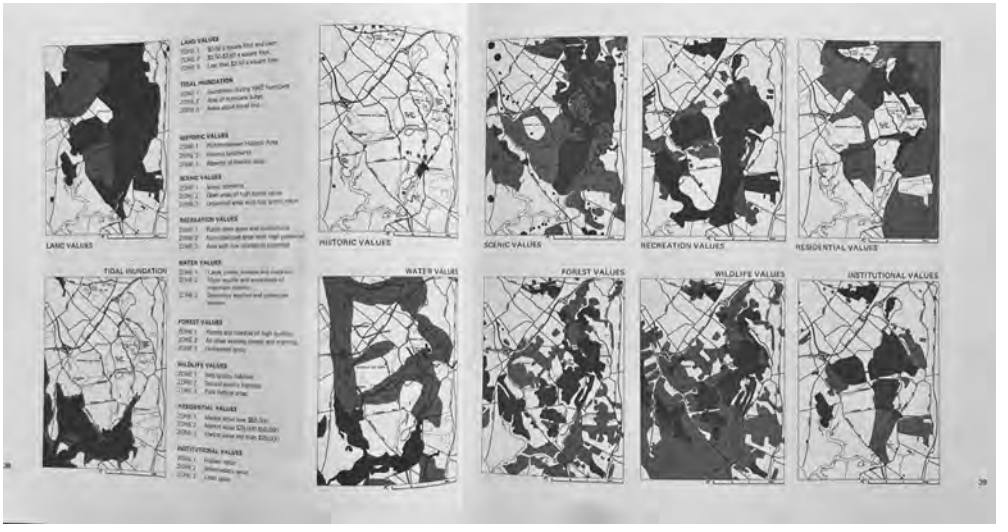

Figure 1.2.5 McHarg's "Ecological Value Maps" from *Design with Nature* (McHarg 1969).

McHargian design methods were based on a version of ecological science that determined an environment's structural stability, or communal equilibrium, on its maintenance of form amidst disturbance. In other words, in the face of environmental change, regardless of its pace—a wildfire or an increase in the earth's average temperature—the ecology's constituents must be able to regroup, even if their assemblies have been slightly reorganized, if they are to maintain form. In this, McHarg's methods registered ecologies as non-static assemblages; but in his effort to ascertain the "best fit" between nature and culture, economy and ecology, the boundaries between land uses, materials, and communities had to be clearly defined. In real-world environments, however, a constant pattern of disturbance and adaptation is necessary for survival; and the mark of a healthy and stable community structure is its ability to change while maintaining qualitative consistency, even if the quantitative structure differs from the original baseline (Fränzle 2001: 65).

Whereas McHarg's cartographic analysis, or representational modelling of ecologies did not allow for slight, constant realignments between constituents and their uses, the recent work of Chris Reed and other landscape architects and theorists, however, addresses this point precisely; they have forged a wholly different pathway, towards landscape as a dynamic assemblage, continuously in flux.

In "Projective Ecologies," Reed and Nina-Marie Lister reference James Corner's assertion (Corner 1999) that representation—modelling, drawing, and writing—has long been the vehicle of evolution and clarification for ecological practices (Reed and Lister 2013: 20). Although McHarg may have recognized that ecological systems were not static, he constructed an image and thought process about ecological systems that inscribed ecologies into particular instances of space and time. In selecting the modifier, projective, Reed and Lister openly acknowledge that the modes of representation used to explore ecologies and environmental dynamics do as much to create and speculate on their futures as the scientific observations themselves (20). Reed, a founding partner of STOSS, and a landscape architect, has designed several award-winning and realized landscape projects; perhaps his greatest contribution towards the future of ecological thinking and design, however, is the ever-evolving representational techniques he has developed in his studio work on faculty at Harvard's Graduate School of Design.

Conclusion

Design with Nature ushered in a new way of seeing, quantifying, and representing the constructed and naturally occurring worlds we inhabit. In doing so it gave license to designers of land and urban forms to uncritically embrace their means to whatever end. Its publication, in retrospect, seems an almost inevitable by-product of what *Time Magazine*'s founder, Henry Luce called in 1941, before the United States entered the wars in Europe or the Pacific, "The American Century." Immediately following the war, the enthusiasm by such architects and designers as Charles and Ray Eames, Richard Neutra, R. Buckminster Fuller, Mies van der Rohe, and Eero Saarinen, to find new uses for the matériel of war absent any concern for its association, were great; acts of resistance among design professionals were so few and feeble they were best registered in farce. Perhaps the most poignant is found in such films as Jaçques Tati's *Playtime*, *Mon Oncle*, and *Traffic*, and Stanley Kubrick's, *Dr. Strangelove, or How I Came to Love the Bomb*.

McHarg's work, at the scale of landscape and regional planning, mirrored Gropius's and later Gropius's successor at Harvard, Jose Luis Sert, who brought to architecture and urban planning the same scientific method, using similar techniques, and rendering similarly problematic answers. One lesson history teaches us is that yesterday's revolutions never provide answers to the problems of the day and the revolutionaries of yesteryears quickly become today's establishment. That said, the landscape of design education and practice of today seems to have much in common with that of the late 1960s and 70s, evinced in the embrace of new technocratic methods of representation and production for their own sake. Yet, what of the unintended consequences of this enfoldment? Where in this scenario is there play for designing for space for potential events rather than tightly scripted algorithms?

In *S, M, L, XL* Rem Koolhaas suggests that the role of the architect should not be to design precise, controlled outcomes, but to seed the ground for new, unpredictable possibilities (Koolhaas 1996). Sanford Kwinter takes this a step further in *Far from Equilibrium: Essays on Technology and Design Culture*, calling for a re-imagining of the architectural and urban project, embracing the inde-terminacy of ecological forces and structures as a design strategy for creating living, albeit synthetic, environments (Kwinter 2008). Informing the work of Chris Reed and his contemporary practition-ers and colleagues, this call to work *with* the chaotic nature of ecology recognizes the inevitability of change and uncertainty in healthy living systems, eschewing the notion that an ideal ecology can be assigned to any particular place or time.

McHarg's methods and claims of objectivity from four decades ago, from another time and place, may seem easy targets for contemporary criticism. Yet, McHarg and his associates are responsible for encouraging urban planning practices to consider the natural world as inextricably connected to and shaped by the urban, by us. That said, we have long since learned that design cannot presume controllable, predictable outcomes.

An important task today for designers, historians, and critics of ecosystems requires that we engage with data and technological methods to better understand how the changes made to an already existing site coalesce within an always-changing living environment. If an ecotopia exists, it is one *of* change that proceeds at a pace slow enough to never notice the hand of a designer.

This chapter has been one part history, one part critique, intended as a provocation to action—to incite more reflective design practices and greater criticality to our shared past. Our work is not unique in this; Anne Spirn's cautions made at the 1994 Dumbarton Oaks Annual Symposium—particularly her excellent critique of James Corner's work (Spirn 1997). Yet, the issues, problems, and challenges discussed earlier began decades before, just as McHarg's scientistic methodologies were being uncritically embraced by design professions in search of their own legitimacy.

That said, as scholars and educators, we recognize that what we write, we write from within theory and polemics, not from outside them—we write from within history itself. This challenge is further complicated when its subject matter is the History of the Recent Past. It is only since the Second World War that the world's most prestigious doctoral programs have given their imprimatur to the study of such events. History is unstable enough, especially when it starts talking back. Four decades ago, in his inaugural address as Regius Professor of Modern History at Oxford University, Michael Howard defended this relatively new practice while explaining the historian's essential dilemma, made more acute by dwelling in the Recent Past.

> The trouble is there is no such thing as "history." History is what historians write, and historians are part of the process they are writing about. . . . We know that if our work . . . survives at all, will be read as evidence about our own *mentalité* and the thought processes of our own time rather than for anything we say about the times about which we write, however careful our scholarship and cautious our conclusions. We also know . . . how incomplete our knowledge of the past is bound to be; either because we have so little to go on, or for more recent times, because we have so much and have to be rigorously selective if we are going to make any sense of it at all.
>
> *(Howard 1982: 429)*

It is little wonder that Andy Warhol could retort, "Art is what artists do"; so too Michael Howard gives us that history, the history of the Anthropocene, of Ian McHarg's legacy, ecological design practices, and the limits and perils of mapping strategies, is what historians of design practices do. We recognize that our methods and manners reveal more about us than they do about our subjects and any sense of closure we might wish to reach. That if any of our work "survives at all, [it] will be

read as evidence about our own *mentalité* and the thought processes of our own time rather than for anything we say about the times about which we write."

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