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Anthropological Relocations and the Limits of Design

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Abstract

This article takes as a touchstone the concept of location as it has been articulated through anthropology's reflections on its history and positioning as a field, and in relation to shifting engagements with contemporary technoscientific, political, and ethical problems. A second touchstone is one specific anthropological relocation—that is, into worlds of professional technology design. With figures of location and design in play, I describe some perspicuous moments that proved both generative and problematic in my own experience of establishing terms of engagement between anthropology and design. Though design has been considered recently as a model for anthropology's future, I argue instead that it is best positioned as a problematic object for an anthropology of the contemporary. In writing about design's limits, my argument is that, like anthropology, design needs to acknowledge the specificities of its place, to locate itself as one (albeit multiple) figure and practice of transformation.

INTRODUCTION

"The future arrives sooner here." Driving my car down Hillview Avenue in Palo Alto, California, one evening around 1995, I hear this assertion on U.S. National Public Radio, spoken by a Silicon Valley technologist who is being interviewed. It elicits a by-now-familiar response—I have inhabited the Valley by this time for 15 years—a bodily resistance to being hailed into this claim to the vanguard, with its attendant mandate to enact the future that others will subsequently live.

These words constitute a place—a "here"—that comprises part of my problematic. They position the speaker in an identifiable territory, indexically referencing the interviewee's location as the Silicon Valley and in turn, of course, performing the existence of that place once again through this naming of it. And in their positing of a singular, universal future, they reiterate, as well, a past in the form of a diffusionist model of change. Described by Fabian (1983) in *Time and the Other* as a form of temporal distancing, this "involves placing chronologically contemporary and spatially distant peoples along a temporal trajectory, such that the record of humanity across the globe is progressively ordered in historical time" (p. 13). The kind of spatial and temporal distancing enacted in a statement such as this is also, in this sense, a colonizing move.

We can read this statement as reproducing the neocolonial geographies of center and periphery, and temporalities of technological development, that in the mid-1990s underwrote the Silicon Valley's figuration as central to the future of everywhere. Escobar (1994) proposes the term "technoscape" to reference the ways in which discourses and practices generated by and around information and communications technologies comprise a kind of landscape to be inhabited. Like other maps, depictions of the technoscape are not simply aids to navigation through an already-existing terrain, but propositions for a geography within which relevant subjects and objects might claim their place. Appadurai (1997) develops this trope further through the figuring of five "scapes" (which he designates as ethno, media, techno, finance, and ideo), meant to articulate multiple geographies "constituted by the historically situated imaginations of persons and groups spread around the globe" (p. 33). The value of the trope of scape for Appadurai is its orientation to disjunctures as much as continuities within and among these mappings so that they interact and intersect in multiple and specific ways (see also Barry 2001, p. 37). And writing of "techniques for the production of locality" (Appadurai 1997, p. 182), Appadurai emphasizes that the local is not the ground for cultural analysis but the figure, not already given but constituted in and through practices such as the statement with which I began.

Postcolonial scholarship has taught us that centers and margins are multiple and relative, and futures can be enacted only in what Tsing (2005) names "the sticky materiality of practical encounters . . . the makeshift links across distance and difference that shape global futures—and ensure their uncertain status" (pp. 1–2). These encounters happen within circulatory systems characterized by specific moments of place-making and transversal movement, processes that we are just beginning to articulate in ways other than through the simple tropes of local knowledge or global flows. Locally enacted effects are made to travel less through easy flows than through messy translations and, as Tsing observes, those who claim to be in touch with the universal are notoriously bad at seeing the limits and exclusions of their own knowledge practices (p. 8). Postcolonial forms of future-making, it follows, require geographies that have less certain centers (Redfield 2002, p. 794). One contribution to the project of relocating future-making, then, is an anthropology of those places presently enacted as centers of innovation that illuminate the provincial contingencies and uncertainties of their own futures, as well as the situated practices required to sustain their reproduction as central.

The first touchstone for my article is this concept of location, as it has been articulated in the context of anthropology's reflections on its history and positioning as a field and in relation to shifting engagements with contemporary technoscientific, political, and ethical problems (see, for example, Clifford & Marcus 1986, Strathern 1995, Gupta & Ferguson 1997, Ong & Collier 2005). A second touchstone is one specific anthropological relocation in which I have been directly implicated: into worlds of professional technology design. Considered recently as a model for anthropology's future (Rabinow et al. 2008), I argue instead that design and innovation are best positioned as problematic objects for an anthropology of the contemporary. I share an interest in ways of theorizing change, breaks, ruptures, and the new that do not rely on singular origins, definite moments of invention, or trajectories of progressive development. And I share as well a commitment to an anthropology that works across disciplinary boundaries within the academy and allies with relevant practitioners in other locations. At the same time, I believe that we need less a reinvented anthropology *as* (or for) design than a critical anthropology *of* design. The latter requires, among other things, ethnographic projects that articulate the cultural imaginaries and micropolitics that delineate design's promises and practices.

With figures of location and design in play, I offer what I hope are some perspicuous moments, encounters that proved both generative and problematic in my own experience of establishing terms of engagement between anthropology and design. I reflect on what insights these anthropological relocations might offer regarding what I am calling here the limits of design. In writing about design's limits, my intention is not to diminish the value of projects aimed at thinking through rearrangements and transformations that could address pressing problems or explore untried possibilities. Rather my argument is that, like anthropology, design needs to acknowledge the specificities of its place, to locate itself as one (albeit multiple) figure and practice of change. I recall how knowledge practices and values have been figured in the history of professional design, particularly within the United States since the mid-twentieth century and with what effects. However suggestive, we cannot mobilize the trope of design without attending to that history and its legacies. Among the latter, I argue, is a conception of design method that has, until recently, gone largely uncontested and that systematically obscures the questions that anthropology might find central to a consideration of what constitutes transformative change and how it happens. Thinking about design as method directs our attention to what Law (2004) has named design's "hinterlands"; that is, that on which method relies, but which necessarily overflows its frame (see also Callon 1998). This is another sense of limits that I seek. Method (as ethnomethodology has extensively demonstrated) presupposes an open horizon of competencies and contingencies on which its efficacies depend, but which it can never fully specify (Garfinkel & Sacks 1970). These observations alert us to the ways in which conventional design methods are (necessarily) silent on matters that anthropology would be interested in articulating. And they suggest the sense of the limits that I seek, putting professional design in its place in ways that could help us to think through its history and possibilities in a more critical and generative way.

RELOCATIONS

My thinking about these questions draws from an archive of memories and documentary materials assembled during my 20-year tenure (from 1979 to 1999) at Xerox's Palo Alto Research Center (PARC). At its founding in 1970, PARC represented an investment in making technology futures. Deliberately placed far from Xerox's corporate headquarters in Connecticut, the story goes, the research center was located on the west coast of the United States, in the nascent Silicon Valley, and charged with making a difference. In a topography mirroring earlier waves of westward expansion, PARC is positioned within this imaginary as a kind of advanced settlement on the frontier of the emerging markets of computing. But frontiers, Tsing (2005) reminds us, are "not just discovered at the edge; they are projects in making geographic and temporal experience" (p. 53). Like its predecessors, the frontier of computing was imagined to be indefinitely extensible, even more reflexively an effect of the activities of those who gain benefit from it than were frontiers marked more obviously by landscapes and natural resources. And as Tsing observes, "[t]he activity of the frontier is to make human subjects as well as natural objects.... It is a space of desire: it calls; it appears to create its own demands; once it is glimpsed, one cannot but explore and exploit it further" (pp. 29–32).

The decade of PARC's founding coincided as well with a particular moment in American anthropology's relocation as a field, the turn to "studying up" set out most famously by Laura Nader (1974) in her contribution to the edited volume, aptly titled for my purposes, *Reinventing Anthropology*. Committed to this call as a student of anthropology, I had the broad aim to engage with power performatively through an ethnography of the everyday life of a major American corporation. Searching for a site in which to pursue this project led me, through a series of serendipitous circumstances, to Xerox and, more specifically, to Xerox PARC. (For a more extended account of the history of anthropological engagement at PARC, see Suchman 2011). And I became drawn, on my arrival at PARC, into questions of technology.

The founding of PARC in 1970 was symptomatic of Xerox's early concerns with its place in the imaginaries and technologies that comprised what was then figured as the "office of the future." I return to this storyline below, but first fast-forward to the 1990s. The office of the future (at least in its paperless imagining) is a thing of the past, whereas digital information systems comprise an unremarkable, albeit continually changing, medium of administrative work. The Systems Science Laboratory in which I held my first research internship is now the Knowledge and Practices Laboratory, and the Work Practice & Technology research area, established in 1989, is in place. Gradually achieving sufficient credibility to constitute a small research group comprising four anthropologists and two computer scientists, we mobilize arguments about the value of an anthropologically informed research practice.[1] Our arguments have opened the space for a range of collaborations: critical engagement with cognitive and computer scientists around questions of intelligence and interactivity; collaboration with system designers aimed at respecifying central issues for them including the human-machine interface, usability, and repair; extensive studies of work settings oriented to articulating technologies as sociotechnical practice; engagement with an emerging international network of computer scientists and system designers committed to more participatory forms of system development with relevant workers/users; activism within relevant computer research networks to raise awareness of those alternatives; and iterative enactment of an ethnographically informed, participatory design practice within the context of the research center and the wider corporation. These efforts took advantage of the ways in which our position at PARC—in its identification as a center for basic research and its members as academically recognized scientists—afforded us margins of maneuver to sustain affiliations that overflowed the conventional market frame (Barry & Slater 2002, p. 303). Although this strategy, and the extended history of collaborative experimentation and engagement through which it was realized over two decades, was unquestionably fruitful, it also raises a number of questions that have yet, in my reading, to be fully or clearly addressed. To do that requires bringing into view the politics of design, including the systematic placement of politics beyond the limits of the designer's frame.

DESIGN

One of the marks of a technological society, Barry (2001) observes, is an orientation that privileges change and then figures change as technological innovation (p. 201). Innovation, in turn, is embedded within a broader cultural imaginary that posits a world that is always lagging, always in need of being brought up to date through the intercessions of those trained to shape it: a world, in sum, in need of design. A particularly encompassing expression of this orientation is the project titled Massive Change, launched around 2005 by Canadian designer and architect Bruce Mau and the Institute Without Boundaries (a small team operating out of Mau's studio in Toronto) (see **Figure 1**).

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[1] Founding members of the group along with me were Jeanette Blomberg, Brigitte Jordan, David Levy, Julian Orr, and Randall Trigg.

Massive Change, the Web site proclaims, "is not about the world of design. It's about the design of the world." The text continues:

> Design has emerged as one of the world's most powerful forces. It has placed us at the beginning of a new, unprecedented period of human possibility, where all economies and ecologies are becoming global, relational, and interconnected. (Bruce Mau Design, Inst. Without Bound. 2005)

Design has emerged as a force of nature, this declaration implies, and "it" now places "us" at the beginning of something unprecedented and global. This announced tipping point, of past and future action, is a hallmark of new things. "Capacity," represented by a supercomputer made more super by a fish eye lens, promises that "we" can now "plan and produce desired outcomes through design" at an unprecedented scale. This leads, seemingly inexorably via an orange arrow, to the "global scale," a cycle of movement of things that, while seeming circular, presumably heads somewhere that we want to go. This is confirmed by the resulting optimism that we can, or will, for the first time in history "minimize unintended consequences and maximize positive outcomes," implicitly delivering innovations such as the hippo roller, a polyethylene drum designed by South African designers Pettie Penzer and Johan Jonker to enable transport of 20 gallons of water over rough terrain with minimal strain on the body. (This is not as far as I can tell itself a project of the Massive Change initiative but is funded and distributed through the World Food Program and other nongovernmental organizations.)

The position of design is further illustrated by a model (**Figure 2**) in which design moves from being one among the four primary elements of nature, culture, business, and design (albeit at the core) to being the enveloping, encompassing, and, by implication, directing force, leading to a reiteration of the nineteenth-century declaration of the conquest of nature and the rhetorical query regarding the future: "Now that we can do anything what will we do?"

Tracing the genealogy of this proposition, that we can do anything, might take us back again to the 1970s, a particular decade in the history of professional design in the United States. The first call for a science of design is commonly attributed to Herbert Simon's manifesto, *The Sciences of the Artificial* (1969), based on a series of lectures delivered (we can imagine to an audience composed largely of scientists and engineers) at Massachusetts Institute of Technology. Trained as a political scientist, Simon received the Turing Award in 1975 for his contributions to artificial intelligence (AI) and the psychology of human cognition, and three years later he received a Nobel Prize in economics for "his research into the decision-making process within economic organizations" (Nobelprize.org 1978). Simon's design palette, then, encompassed the multiple sites targeted for a science and technology of enhanced rationality in the mid-twentieth century, from brains to boardrooms. For Simon, the road to scientific legitimacy was paved with a requisite reduction in so-called intuitive judgment, in favor of demonstrable rationalities, a move from in his words "soft cookbooky" knowledge to "a body of tough, analytic teachable doctrine" (Simon 1969, p. 113).

In his collection of responsive essays titled *The Politics of the Artificial*, Margolin (2002) argues that one result of Simon's paternity is a lineage focused "more on creating . . . models of the design process than on developing a critical theory of practice" (p. 237). Margolin observes that Simon's rhetoric naturalized design methods and embedded them in a technical framework that privileged systems thinking as a means of generating design projects and efficiency as a way of judging the effectiveness of design thought (p. 238). In calling for a more "open conception" of design activity, Margolin urges a positioning of history, theory, and criticism as central rather than peripheral elements, including critical examination of conceptions of design theory inherited from Simon and his followers. In thinking of design as a social practice, Margolin argues, we are always obliged to consider and evaluate the conditions in which it occurs. He concludes that "[i]f designers are going to realize the full potential of design thought, then they should also learn to analyze how the situations that frame design practice are themselves constructed" (p. 241).

It is this question of the situations that frame design, and the frames that condition professional practice, that comprises the grounds of my own engagements. To make this more concrete, I offer brief accounts of interventions undertaken with respect to three problems: office procedures and their automation, the design of intelligent machines, and design methods themselves. My aim is to describe some strategies of reframing that proved generative in each case. At the same time, and through those reflections, I suggest some limits to design and their implications for a critical ethnographic practice.

Intervention 1: Procedure

My first internship at PARC in 1979 positioned me with a group of computer scientists engaged in "modeling" office work in service of the design of computer-based information systems. My colleagues' approach began from the premise that office work is essentially procedural in nature, involving the execution by office workers of a prescribed sequence of steps. Understood algorithmically, "office procedures" seemed ready made for automation. My ethnomethodological background, in contrast, alerted me to the likelihood that "procedure" as a term of art in office work was something quite different from the models that my colleagues were developing. To explore this notion, I proposed a small study of the actual practice of the kinds of routine office work that were the focus of my colleagues' diagrammatic representations. This led me, in turn, to the accounting office at PARC and the work of "processing" expense reports and accounts payable. My study began from the observation, in a paper published by two of my colleagues, that specification of even the most routine clerical work as a schema of procedures was an unsolved problem in automated office systems design (Ellis & Nutt 1980). The difficulty, they suggested, was tied to the "softness" that characterized representations of office procedures provided by workers. Whereas for computer scientists "procedure" had a very definite technical sense, for practitioners of office work the term seemed to have some other, more loosely formulated meaning and usefulness. It was the question of the status of office procedures for practitioners that organized my own research. But rather than produce an alternative formalization of the work, I sought at least a partial account of the lived work of getting it done.

The more specific focus of my study became the practices through which evidence provided by documents, coworkers, and clients is used, in conjunction with knowledge of accounts payable regulations, to generate a record of actions taken "according to procedure" (Suchman 1983). Workers in the accounting office were animated by the scenario of the audit, in which a file selected at random would be read as evidence that the actions documented were procedurally compliant. This involved assembling documentary records of compliance out of the practical contingencies of actual cases. This is not to say that workers faked the appearance of compliance in the records. Rather, the work of accounting was to create a record that documented an accountable relation among procedural requirements (for spending money on business travel or for ordering and paying for goods received), actions and events in the world, and payments made. My study suggested that the procedural structure of organizational activities was an effect of the orderly work of the accounting office, rather than its antecedent and determining condition. This view, in turn, recommended an understanding of office work that attended to judgmental practices presupposed, but not fully articulated, by its procedural specifications. Those practices, irremediably, overflowed the frame of the work's representation.

Intervention 2: Inference

My interventions regarding office work resonated with emerging divides within the field of computer science in the early 1980s, between approaches to automation based in information flow and control and a growing interest in knowledge-based systems and AI. By the early 1990s, the Systems Science Laboratory had been renamed the Intelligent Systems Laboratory, and my colleague Randall Trigg (a computer scientist with a background in AI) and I set out to do a small case study of an initiative in AI then under way within the laboratory (Suchman & Trigg 1993; for my primary engagement with this field, see Suchman 2007). The initiative was itself a form of indigenous critique: an effort, motivated by certain dissatisfactions among our colleagues with mainstream research in AI, to design a situated inference engine (SIE), a machine capable of taking advantage of the implicit context and embedding circumstances of its interactions with a human user (CSLI 1987). Researchers on the project saw their efforts as leading to a significantly different view of computation than was prevalent in AI at the time. This included the notion that computers are physically embodied and contextually embedded, such that their abilities and limitations depend on a physical substrate and a surrounding situation.

Work on the SIE at the time involved two related enterprises: (*a*) constructing scenarios of activity that raised certain thorny representational issues in AI and (*b*) designing and implementing a computer program that ran the scenarios, providing evidence that the behaviors identified there were realizable in a machine that could participate in the activity represented. At this stage in the project, however, the goal was less immediately to build a usable artifact than to develop a new formalism within a subfield of AI known as knowledge representation and to demonstrate the formalism's efficacy to other practitioners. The enterprise of knowledge representation at that point lay at the heart of AI (Brachman & Levesque 1985). Crucially, representations of knowledge in the case of AI are more than passive texts. Rather, they must combine data structures and interpretive algorithms in such a way that the program that runs over them will produce recognizably knowledgeable behavior (Barr & Feigenbaum 1981, p. 143). It was this problem, of combining data structures and algorithms to produce appropriate machine behavior, that constituted our colleagues' project.

Our study of work on the SIE included a close reading of a videotaped episode of two researchers, both computer scientists, engaged in a design session, done at this point in their project not at the screen but at a whiteboard. As Newman (1998) observes, to a large extent and for much of the time the technical object of software design is embodied as textual-graphical renderings (typically annotated boxes and arrows to indicate components and exchanges of input and output among them), along with the talk and animating gestures of relevant actors: performances and effects that Newman has named "techniques of virtualization" (p. 236). The materials for work on the SIE on this occasion were a textual scenario and a developing language of graphical formalisms. To be effective, the scenario with which the researchers worked needed to be plausible as a representation of familiar practices, while being translatable into the graphical language. The graphical formalisms, in their turn, needed to be readable in terms of the scenario at the same time that they set up the conditions for its inscription as code interpretable by a machine. Through the devices of scenarios and formalisms, our colleagues were attempting to bring practical activity under the jurisdiction of runnable programs.

Their work as we witnessed it was not a simple unilinear series of transformations from human behavior to code, however, but the crafting together of a collection of diverse materials and accountabilities. Drawing from a range of vocabularies and orienting to multiple audiences (including computer science, philosophy, mathematics, engineering, and psychology, as well as their own everyday experiences of scheduling), the researchers' task was to work across, and between, lived experiences, scenarios, formalisms, and code in such a way that each maintained an accountable relation to the others and to their fields of origin and reception. It was this kind of practical and material intertextuality that led us to characterize the work as a form of craftwork, a process of assembling together heterogeneous materials into a coherent whole. Like any product of skilled practice, moreover, the formalism inscribed on the board left behind the situated logics of its own production and use. Given this, our study was aimed at articulating the work of designing intelligent machines as a form of embodied social practice—a form made more interesting by AI's own concern with the delegation of social practice to machines—that demonstrates not only the efficacy but also the limits of representation.

Intervention 3: Prototype

Lastly, I turn to the prototype, an artifact with particular performative characteristics within the work of new technology design. One understanding of the prototype is as a response to the persistent troubles of system requirements and formal specifications that formed the doctrine of Simon's design science. For many if not most advocates of prototyping within mainstream professional design, prototyping represents a strategy for uncovering user needs, taken as already existing but somehow latent, unarticulated, or even unrecognized by practitioners themselves. The project then is to elicit these pre-existing attributes from the prospective user, to express them precisely, and thereby to make them available for use by system designers. An alternative position is that prototyping practice simultaneously recovers and invents work requirements and technological possibilities that make sense each in relation to the other. A case in point was a project that we conducted in the late 1990s, at the headquarters of a state department of highways (Suchman et al. 2002). For approximately two years, we engaged in a collaborative research effort with engineers at the department charged with the design of a bridge scheduled for completion by the year 2004. The focus of our prototyping efforts with members of the bridge project was a collection of their documents—a heterogeneous assortment of letters, memos, reports, newspaper clippings, maps, and the like—that together provide an archive of professional and organizational accountability. We embarked on a cooperative design effort with the engineering team aimed at understanding whether digital media might provide new and useful ways of accessing their collection. More specifically, this involved understanding just what would be required to move their project files, currently kept on paper in three-ring binders, into an electronic, computer-based repository with a rich search interface.

Latour (1996) observes that technical projects encounter not only human actors who are differently interested and aligned, but also assemblages of things that may or may not be compatible one with another (p. 57). Perhaps nowhere is this more true than with software, despite its famed flexibility. Compatibility, the requirement for things to work with one another, can be missing for a plethora of reasons. These range from the deliberate inclusion in one device of proprietary or closed software that makes it impossible to integrate that device with others, to simple oversight on the part of developers, to historical discontinuities that leave gaps that dedicated labor (that may or may not be available) is required to fill. Far from the de novo invention of a new device, then, configuring the project files prototype included identifying appropriate hardware and software and acquiring the various pieces required through a variety of channels (purchasing and downloading from the Internet, primarily). It included as well, and essentially, designing the computational glue that would connect them together into a coherent and working whole.

The aim for the prototype that we configured and installed in the project team's workspace was that it should archive the documents in the project files in recognizably familiar, but newly flexible ways. This included novel renderings of documents that nonetheless made sense with reference to working practices. As it was assembled on site, the prototype stood as a kind of developing description of how it was that engineers were interested in accessing their documents. But more than just description, the prototype offered a provisional proposal for a new way of working. It did so not simply as a matter of talk, but as a means for trying the proposal out. In response, it elicited either a "Yes, that makes sense," or an account of how it was that, in that proposal, we had missed the point. It is in this sense that prototypes perform as working artifacts—artifacts whose significance is not given in their specifications but in the unfolding activity of cooperative design-in-use. The prototype reworked the configuration of project files as documents, classification schemes, and associated work practices into a new, screen-based workspace. But it also illuminated the coherence of technical artifacts as a contingent achievement in ways deliberately obscured in professional talk about methodical design. In this respect the prototype worked as a reflexive probe into the practical materializations that configure new technological objects.

REPRODUCING INNOVATION

It was during the mid 1990s, as we were engaged in the project just described, that the imperative of innovation doubled back to take as its object PARC itself. With mainstream management discourses focused on business process reengineering, laboratory managers at PARC circulated a round table interview published in the *Harvard Business Review* with four chief executive officers (CEOs) "who have pioneered the shift to process-based organizations," including Xerox CEO Paul Allaire (Garvin 1995, p. 77). The interviewer at the opening of the session remarks that across the substantial differences in the industries involved (document processing, insurance, pharmaceuticals, and soft drinks) the observations about processes and process management are strikingly similar. SmithKline Beecham's Jan Leschly praises processes for the ways in which they make repetition possible:

> We realized that a capability comes only by combining a competence with a reliable process. To be a leader in biotechnology, you first need the best cellular and molecular biologists in the world. But that isn't enough. You must also have a reliable, repeatable discovery and development process; otherwise, products won't emerge regularly from the pipeline. These larger processes are themselves divided into many smaller ones – in the case of product development, more than 3,000 in all. Today each of these processes is charted and on the way to being repeatable and controllable. (p. 78)

In this imaginary, the control technologies of operations research, developed first, as Noble (1984) reminds us, in the context of mid-twentieth-century military operations and then applied to "continuous process industries where the product itself was in a liquid or gaseous form and thus could literally be made to flow" (p. 59), are applied to the control of organizations. In the roundtable interview, Xerox's Allaire makes reference to the Xerox 2000 Process, at the end of which

> our senior team created a list of some 60 possible assumptions about the future. Then we voted on the ones that we deemed most likely to prove valid. Some of the assumptions were particularly thorny, such as whether paper would continue to be widely used in offices .... The validated assumptions led us to a new set of imperatives ... as well as to a new strategic direction, which we called the

> Document Company . . . . We soon realized that the organization had to be redesigned to reflect our strategy, and that's when we began focusing on process. (Garvin 1995, p. 78)

Allaire offers as well an argument as to why processes are empowering rather than constraining, arguing that "if you have processes that are in control, you know how the organization is working . . . . Couple that with objectives that are consistent with your strategy and communicated all the way down the line . . . and you get quality output without a lot of checking" (p. 78). SmithKline Beecham's Leschly admits, however, that acceptance at his organization was in part effected by getting rid of those who resisted: "We found that we needed people who were capable of adapting to a completely new way of running the business," to which Pepsi's CEO Craig Weatherup exclaims "Bless you! It's good to know I have company. I also had 12 people reporting to me at the start of our change process. That was four years ago, and today only 2 of them remain." He elaborates the process of "enrollment":

> We ended up calling it "head, heart, hands" because we believed that for change to occur, people had to do three things: develop a conceptual understanding of the rationale and proposed direction of the change, internalize and commit emotionally to the new vision, and acquire new skills to ensure that the vision would be realized . . . our basic message was, Don't go underground. Either sign up or we'll be happy to give you a nice severance package—and you can go work for somebody else. (p. 84)

The roundtable discussion offers a context for the redesign exercise initiated at PARC in the same year. At once responsive and resistant to corporate precepts regarding the management of change, the process at PARC began with a series of discussions among senior staff (center and laboratory managers), which was subsequently expanded to include research area managers and principal scientists. This wider exercise took the form of two off-site workshops held at a downtown Palo Alto hotel during the summer of 1995, at which participants were assigned to tables that subsequently became the identifiers for a series of working groups. (I, for example, became a member of Table 7). The Tables, in turn, were charged with formulating key problems or questions, reflecting concerns attributed to the research staff. Table 7's problem, for example, formulated an anxiety about what seemed at the time to be a shift in PARC priorities and values, toward more instrumental research promising short-term financial returns to the corporation. The opposition of short- and long-term research was elaborated through Table 7's discussions into a two-dimensional matrix, with the second axis being reactive and proactive: We proposed that all the cells of the matrix could be filled with representative projects. More importantly, perhaps, we suggested that any given project might not just occupy a single cell, but also move through this space. So, for example, a project initiated in response to a business division problem (reactive) might become the basis for long-term research; or an open-ended research project might suggest new directions (proactive) for a near-term product. Sharing the slippery boundaries between research's actual unfolding and its narration, the matrix nonetheless promised to work as a kind of ordering device. Ambiguously framed between descriptive and prescriptive (always thinking of actually existing projects, while designing what was presented as a more general analytic tool), we shared a sense that the outcome of our work was a valuable contribution to thinking about the question that we took up. Initially embraced by senior staff as a tool for mapping current projects and thinking about future ones, this prototype dissolved in subsequent rounds of the exercise. The effects of our labors were diffuse, in the end, less a discrete deliverable in the form of a tool for planning than a series of engagements within an ongoing, more fragmented, and contested conversation.

The limits of the design exercise were formulated, at the time, as an effect of the limits of participation, leading to a call by a number of those involved for the initiative to be expanded to include the entire imagined community of PARC. In October of 1996, senior staff issued an open invitation to all employees to participate in setting a new agenda for research under the name (mirroring that of the parent corporation) PARC 2000. The invitation explained,

> The notion of PARC 2000 is not intended to suggest we are developing a plan targeted for the year 2000. What it does imply is the need to do three things: (1) to comprehend now what the future is becoming, (2) to achieve a platform for continually understanding how we can impact the world by what we choose to do at PARC, and (3) and to launch a near term strategy for if, and how, we should be different . . . Senior Staff . . . are convinced that everyone, no matter what job function you fill, can play an active role in helping us shape the future. (L. Suchman, email archive, 10 October 1996)

The future no longer simply arrives sooner here, but rather has a kind of independent agency positioned beyond the confines, or control, of the research laboratory or even the wider Silicon Valley. And rather than being invented and propagated, this future now requires an understanding of a future that is becoming, elsewhere as well as here, and that might demand a reinvention of the Center itself. PARC's researchers are called on now to shape the future not only for others, but for themselves, not in the sense of "build what you use, use what you build," a maxim that informed the early days of invention at PARC, but in the sense of a future in which they themselves will have a place.

This call from management for participation and collective responsibility for PARC's future was positioned as a democratizing move, and indeed it was. But what were the subtexts that haunted this exercise? Framed as a response to "a rapidly changing context" for the corporation, we were called on to "collectively embrace a more visible and proactive stewardship of PARC's future" (L. Suchman, email archive, 10 October 1996). This call prompted more questions than answers: Why this exercise? Why now? These questions contributed to what became a period of intensive, and competing, rounds of story telling—stories that variously narrated a past that could make sense of the present (what PARC was, and had become), and presents (in the form of existing and imagined projects) that might answer the call to future making (what PARC could be). Many of the stories told had, to those involved in telling and hearing them, little discernable effect. But their generation involved a familiar, competitive micropolitics of self-positioning, and participation was mandatory. Failure to participate risked disappearing from the picture, having no place in the future under construction.

The naming of PARC 2000 as itself a project reasserts the existence of a singular body and incorporates us, as constituents of that body, into collectively articulating its future. But whose project was this, and what should be done with other projects already under way? Framed in terms of PARC's potential, what we could become, the exercise implied a past promise still pending, unfulfilled. The call for vision was responsive to expressions of uncertainty over direction but also enacted researchers as lost and in need of guidance. The problems were articulated innocently, as changes in the outside world, or as personal anxieties inside, as a failure of communication rather than an effect of management discourses and actions, including the continual theme of loss, lack, and the need for reinvention. The discussions held during this period were regularly summarized as lists. These lists, which included assertions of the problems to which the collective self-reflection was a response, worked to dis-integrate PARC, then call for its reassembly. They assembled multiple voices as if they were a single self-contradictory one, while erasing the potentially integrative fabric of the discussions that they purportedly summarized. These lists set the frame for what seemed to be endlessly churning, repetitive reinventions of the crisis and our response. A set of themes was eventually formulated, posited at once as differential rallying points and as a connective tissue (leading someone to propose that we had now become the employees of a kind of artfully crafted fantasy, of a "theme PARC").

The exercise enrolled us, in sum, in taking the organization as an object of design and remaking ourselves, collectively, into something new. This required not only imagining possible organizational futures, but also establishing a past and present PARC against which difference could be measured. Reflecting a familiar pattern in histories of the future (Rosenberg & Harding 2005), the past that was created was a nostalgic one to which, in some respects, the reinvention aimed to return. How, we were asked, might we recapture the intellectual excitement that had been lost? Reference to previous visions (including the office of the future) cast them as unifying and directing rallying points, again positing a difference between the once and future PARC of clarity, integration, and effectiveness and the current situation—the sense of the lost past that the future must regain. These statements forgot the vagaries and uncertainties that my own archives from those earlier times clearly documented. The present, commensurately, was framed as a lack or emptiness to which reinvention was a necessary and urgent response. More specifically, the assertion that we needed to develop a research agenda and vision for PARC presupposed either that there were not already visions in play or that those were rendered obsolete by developments in the world outside. The very fact that a project was already under way could be grounds for its identification as a legacy, something left over from the past that gets in the way of progress toward a new future. This worked, in turn, to silence those of us who felt that (in part in response to previous calls for innovation) we were deep in the midst of carrying through on commitments already made. Rather than responsible action, our reluctance to abandon existing projects and join in the project of renewal was read as a kind of recalcitrance, a form of resistance to change. In this respect the fallacy of the empty vessel—that is, the assumption by those who position themselves at the center of some form of knowledge creation that there is no knowledge anywhere else, but only empty receptacles waiting to be filled—came home to roost (Suchman & Jordan 1988).

In January of 2002, following a series of financial crises resulting in near-bankruptcy, Xerox removed its name from the PARC logo and turned the research center into an independent subsidiary (Adame 2002). Still heavily subsidized by Xerox, the premise is that the new Palo Alto Research Center will generate revenue by licensing its intellectual property, obtaining sponsored research, and commercializing its technology through industry partners. Viewed as an uncertain map for a sustainable future, commentators point to the limited returns from licensing, the lack of financial partners in a position to support long-term research, and the unlikelihood that established companies with their own financial challenges would look to pay premium prices for research not under their direct control. But PARC's current recruiting site offers prospective employees a more positive representation:

> People work at PARC because they want to transform their ideas into real-world breakthroughs...
>
> 1. Your work will have impact. PARC employees work across disciplines, and across the entire pipeline from ideation to commercialization.
> 2. You get the best of "both worlds." We offer the stability of a subsidiary company with the entrepreneurial spirit of a startup.
> 3. Your work will be interesting and varied. You'll work on different projects for different clients (large global corporations, startups, government agencies) across multiple industries and system players.
> 4. You'll never have to pigeonhole yourself. People come in as experts in one area, then reinvent themselves as their interests, and industry-wide problems, evolve (PARC 2011).

Each of these promises indexes its alternate research center (implicitly, the PARC of the past). But rather than a valuation of knowledge-making as a public good, the figure is of efforts wasted through their failure to reach the ultimate goal of commercialization; rather than enjoying the enabling conditions of secure employment, workers entrenched in a stable company miss out on the excitement of entrepreneurship; rather than the rewards of sustained engagement with an elaborating and deepening course of research, labors are relegated to the monotonous repetitions of disciplinary programs, and identities stagnate within the confines of specialized knowledge making.

RECOMBINATIONS

In his call for a "recombinant" anthropology of science and technology, Fischer (2007, p. 539) mobilizes the language of genetics to draw anthropological attention to the "reflexive social institutions" through which the technosciences operate. I take reflexivity to mean that institutions are—can only be—enacted in and through the same ontic/epistemic imaginaries and material practices that produce their constitutive subjects and objects (Verran 1998). In contrast to the premise that institutional reflexivity is a recent, or even yet to be realized, desideratum for technoscientifically infused cultural orders, I take it to be built in to the very possibility of organization (see for example Smith 1990). This means that reflexivity can operate in the reproduction of historically entrenched social arrangements as much as in the interest of innovative and emancipatory ends. In this sense, organizations can be no more or less reflexive, only differently, and with greater and lesser awareness of their own performativity.

In the case of Xerox PARC, our labors included the ongoing reproduction of an organization that warranted and adjudicated the value of ourselves as researchers and of the objects that we produced. Yet this was far from a mechanical form of reproduction. The generation of new technologies, including not least their identification as new, occurs within a crucible of complex and shifting sociomaterial and political formations. I and my colleagues at PARC did work to explore various recombinations of disciplinary practices and technoscientific possibilities during our tenure there. Each project was shaped by what was learned and what was absent from the previous one, the question being always, given what we know now, what should we do next? Given where we are, how can we proceed in a responsible way? But looking back on these efforts I would argue, contra the widely accepted narrative, that a site such as PARC is designed in important respects systematically to block innovation, if by the latter we understand a kind of ongoing or unfolding transformation. In his metaphysics of creativity, Ingold (2010) seeks "an ontology that assigns primacy to processes of formation as against their final products, and to flows and transformations of materials as against states of matter . . . this is to read creativity 'forwards', as an improvisatory joining in with formative processes, rather than 'backwards', as an abduction from a finished object to an intention in the mind of an agent" (pp. 2–3). This rereading of creativity is, of course, inimical to the investment in proprietary rights over fixed forms that underwrites intellectual property, patenting, licensing, and the other legal underpinnings of contemporary capitalism. In this sense, one could argue that the conditions enabling of particular forms of action and disabling of others that PARC provided were at least conflicted—caught between a commitment to openness and flow on one hand, and an investment in objects with definite and fixed boundaries, separable from their surroundings, on the other. The regimes of value that we inhabited pulled in both directions a conflict described by one of my colleagues, in the context of the exercise of PARC 2000, as the thin line between "balance" on one hand and "schizophrenia" on the other.

Things, Ingold (2010) observes "are alive because they leak" (p. 7). Our projects of design aimed to produce, in this sense, things and not objects, and this was an aim in tension with the conditions of possibility that comprise corporate research. The making of things versus objects is not the exclusive provenance of professional designers, but an always already ongoing effect of material practices in motion. A kindred argument to Ingold's has been made by Lave with respect to learning (1988, 2011). Rather than assume an inert person who must be activated to learn, Lave argues that learning is an irrepressible constituent of aliveness, one that formal schooling denies in its very projects of pedagogy. Lave (2011) reads the practice of anthropology, as a theoretical/empirical project, in and through her studies of learning and making by Vai and Gola tailors in Liberia and shoppers and cooks in Southern California—studies that in turn take "comparative educational theory and cognitive theorizing about learning as exemplars of colonialist politics, dualistic argumentation, and experimental method" (p. 34). Embracing a figure of ethnographic projects as always in motion, Lave reflects on her own journey and proposes that "[t]he question is how to become over the long-term an apprentice to one's own changing practice" (p. 2). It is this, research as learning, that she names a critical ethnographic practice. Like Ingold's "thing," Lave's "learning" references a practice always entangled in ongoing lines of movement and relationship, situated in environments that provide its conditions of possibility and furnishings and which it, in turn, works to variously reproduce and transform. This is not only a theoretical and methodological practice but also a political/ethical one as well, insofar as taking account of one's own location and modes of implication is a commitment of feminist anthropology and kindred approaches, as arguably the only basis for a scholarship that illuminates its own entanglements in the knowledge that it makes (Haraway 1988, Strathern 1999, Verran 2001, Barad 2007).

Like Lave's, my own relocation in the 1970s was aimed at an intervention, one that turned into a series of engagements with prevailing figures within information systems design, including labor and practical reasoning, action and interaction, and eventually the politics and professional practices of design itself. Whereas Lave's strategy led her to sites "nominated by historical, political, official Western commonsense theorizing to be marginal and inferior" (Lave 2011, p. 32), my own strategy, inspired by the same concerns, was the opposite—that is, to position myself in a place posited to be a central and superior site of knowledge making. Anderson & Adams (2007) characterize postcolonial science and technology studies as an approach that "challenges us to understand 'global' technoscience as a series of local economic accomplishments, each of them confused and contested" (p. 736). They continue:

> We need multi-sited histories of science which study the bounding of sites of knowledge production, the creation of value within such boundaries, the relations with other local social circumstances, and the traffic of objects and careers between these sites, and in and out of them . . . If we are especially fortunate, these histories will creatively complicate conventional distinctions between center and periphery, modern and traditional, dominant and subordinate, civilized and primitive, global and local. (p. 736)

In contribution to this project, I ask what insights we might gain by shifting questions of innovation, creativity, and the new from their status as unexamined qualities, to constitutive moments in the reproduction of familiar modes of identification and action within particular locales and imaginaries. The universalization of novelty as a good presupposes criteria by which places, persons, and things can be identified as points of origin. But while this qualification implies the existence of criteria applicable across times, events, and materialities, I am interested in interrogating the category of the new according to a more performative metaphysics. The latter aims to characterize innovation's enactment as an identification produced through multiple, particular, intersecting performances (Robbins 2008). Innovation in this sense involves making differences that variously disrupt particular arrangements of interest or, through associated continuities, further fix them in place. At the same time, relevant histories and futures are made. The new on this understanding is an outcome rather than a starting point of assessment; the similarity that enables the making of difference is not inherent in things but an achievement of relevant discursive and material practices.

Postcolonial scholarship within anthropology, science and technology studies, and related fields makes clear that far from a universal good, the valorization of newness is a local preoccupation, identifying actors invested in particular forms of property within specific regimes of commodity capitalism (see Philip 2005). And a performative metaphysics of the new makes evident that originals and copies are not different in kind so much as in time and place, and that just as translation invariably produces difference, novelty requires imitation or likenesses to familiar forms. Bhabha (1994) directs our attention to the indeterminate spatiality and temporality of the "in-between" as crucial to a postcolonial figuration of difference (p. 227), an insight that I take to be generative for thinking about objects as well as subjects and about relations of old and new so central to discourses of design. The latter systematically obscure the "in-between" to assert discontinuity. If we treat oppositions not in terms of fixed boundaries or breaks, however, but rather as ongoing engagements through which each term defines itself in relation to the other, then newness is less a property than it is an articulation that calls out differences from whatever is referenced as the thing that came before. The premium placed on discrete, discontinuous change events and the generally negative value attributed to processes of incremental change are part of a form of wishful thinking that aims to bring about desired transformations without the associated costs in time and human effort. In contrast to the premise that innovation can be measured in terms of the number of ideas that are locked in place through their materialization as patented artifacts, Barry (2001) proposes a view of inventiveness as "an index of the degree to which an object or practice is associated with opening up possibilities.... What is inventive is not the novelty of artefacts in themselves, but the novelty of the arrangements with other activities and entities within which artefacts are situated. And might be situated in the future" (pp. 211–12). I have explored terrain similar to that which Barry identifies under the heading of artful integrations (Suchman 2002). A frame of artful integration emphasizes the ways in which new things are made up out of laborious reconfigurations—always partial, provisional, and precarious—to familiar arrangements and modes of action.

Tsing (2005) provides us with further guidance through her elaboration of the trope of "friction" as a way of figuring encounters with difference, including (but not limited to) anthropological ones. She invites us to think about the ambivalent effects of relations characterized by often uncomfortable alliances, where it is the failure to resolve significant, even incommensurable, points of difference that makes working together (at least in limited ways, for practical purposes) possible. Echoing Verran's (1998, 2001, 2002) exploration of strategies for working disparate knowledge systems together, these writings resonate deeply with the relations of anthropology and design that I elaborate here. Of course the line between generative frictions and those that operate through the denial of power differences and in-built forms of coercion is a slippery one: Not all conciliations are desirable or sustainable. Knowledge in these contexts, Tsing (2005) observes, "grows through multiple layers of collaboration—as both empathy and betrayal" (p. 155). Articulating and negotiating the tricky politics of friction is a continuing and integral aspect of engagement.

My aim in this article has been to weave relocations in the discipline of anthropology since the 1960s together with the rise of professional design as a dominant figure of transformative change. Anthropology's growing awareness of its own colonial history and associated calls for its reinvention have led, among other shifts, to a turn toward "home," understood as the value, even urgency, of anthropological inquiry into locations characterized by their cultural familiarity and their political and economic centrality. For me, this turn unfolded as a long-term immersion within a site identified as a center of innovation and future-making, which became my own professional home. I have traced the outlines of the founding commitment to a "design science" that characterized the growth of interrelated disciplines of computer science, AI, management, and organization theory during the same period that anthropology was beginning its own critical self-examination and the related turn within design research toward a more critical design practice. Outlining a series of moments as illustrative cases, I have articulated an engagement between anthropology and design based in anthropological reframings of received conceptualizations of the design problem. In each case, these reframings shift attention to that which overflows the frame, arguing that those things that exceeded the bounds of design comprise the conditions of possibility for its efficacy. These cases are contextualized within the aspirations of a critical anthropology of design as a way of contributing to the emergence of a critical technical practice (Agre 1997, p. 23). The conditions of possibility for both include recognition of the specificity of location and the generative limits of method, such that a responsible practice is one characterized by humility rather than hubris, aspiring not to massive change or discontinuous innovation but to modest interventions within ongoing, continually shifting and unfolding, landscapes of transformation.

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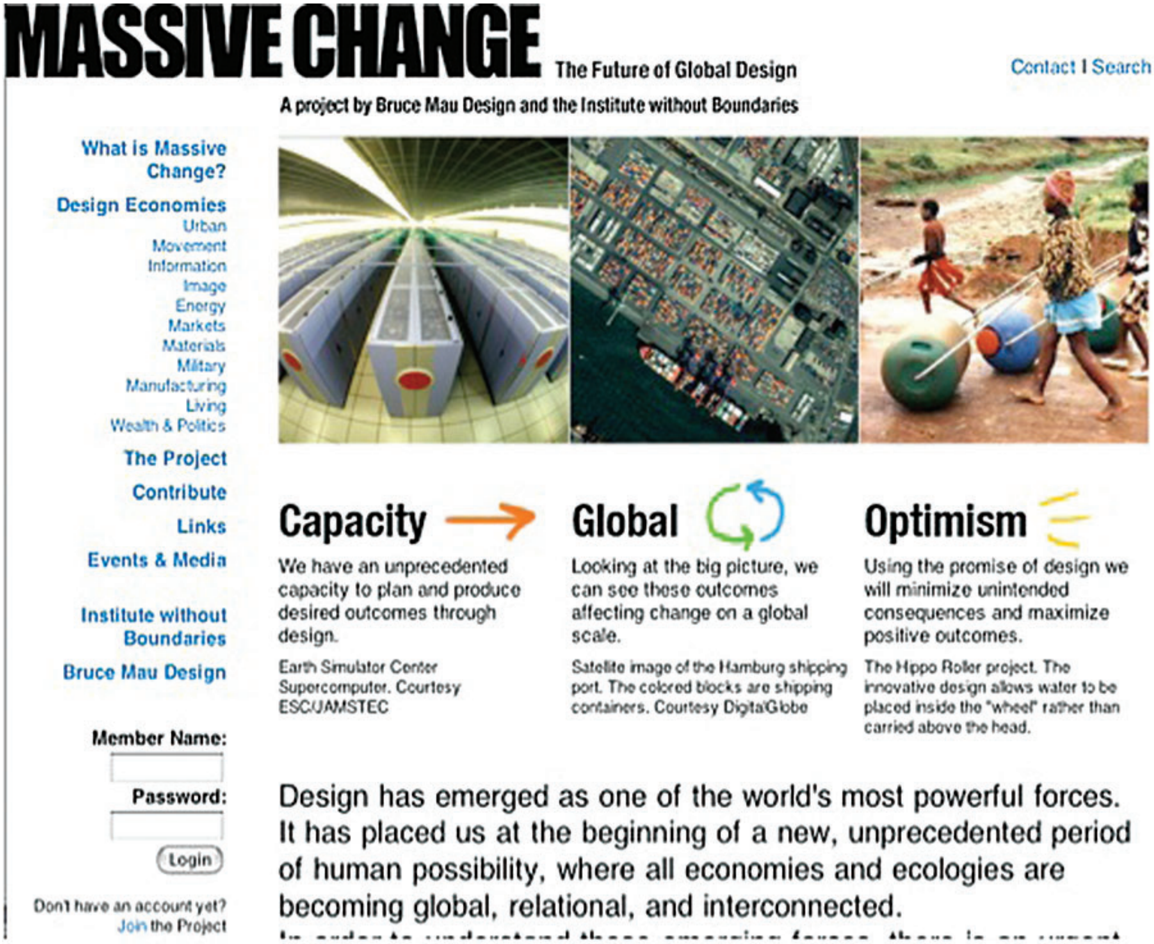
Contact I Search
What is Massive Change?
Design Economies
Urban
Movement
Information
Image
Energy
Markets
Materials
Military
Manufacturing
Living
Wealth & Politics
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Institute without Boundaries
Bruce Mau Design
Member Name:
Password:
Login
Don't have an account yet?
Join the Project

MASSIVE CHANGE The Future of Global Design

A project by Bruce Mau Design and the Institute without Boundaries

Capacity

We have an unprecedented capacity to plan and produce desired outcomes through design.

Earth Simulator Center Supercomputer. Courtesy ESC/JAMSTEC

Global

Looking at the big picture, we can see these outcomes affecting change on a global scale.

Satellite image of the Hamburg shipping port. The colored blocks are shipping containers. Courtesy DigitalGlobe

Optimism

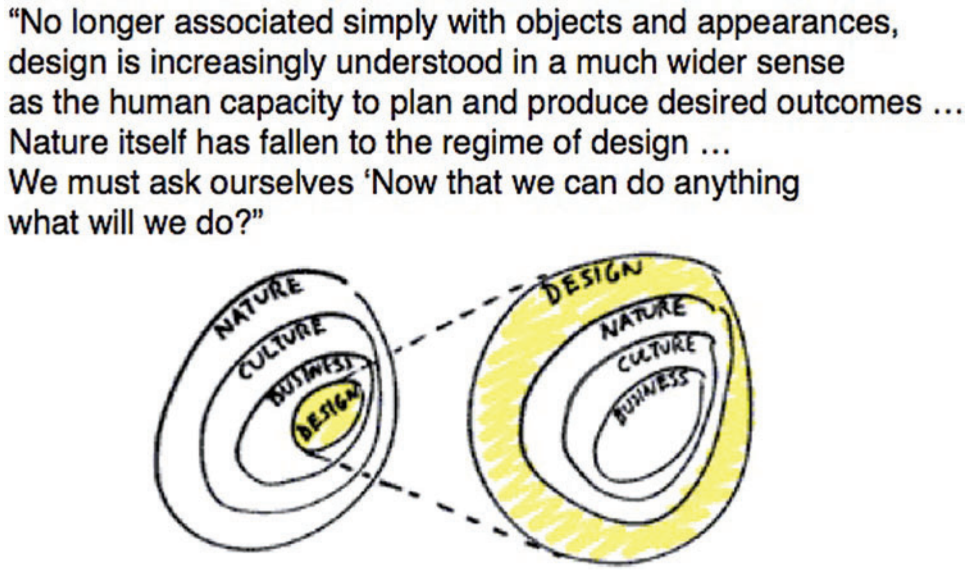
Using the promise of design we will minimize unintended consequences and maximize positive outcomes.

The Hippo Roller project. The innovative design allows water to be placed inside the "wheel" rather than carried above the head.

Design has emerged as one of the world's most powerful forces. It has placed us at the beginning of a new, unprecedented period of human possibility, where all economies and ecologies are becoming global, relational, and interconnected.

Figure 1

The 2005 home page of the Massive Change project. From Bruce Mau Design and the Institute Without Boundaries (2005).



"No longer associated simply with objects and appearances,
design is increasingly understood in a much wider sense
as the human capacity to plan and produce desired outcomes …
Nature itself has fallen to the regime of design …
We must ask ourselves 'Now that we can do anything
what will we do?"

NATURE
CULTURE
BUSINESS
DESIGN
DESIGN
NATURE
CULTURE
BUSINESS

Figure 2

Model showing the primacy of design. From Bruce Mau Design and the Institute Without Boundaries (2005).

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