The Art of Displacement: Designing Experiential Systems and Transverse Epistemologies as Conceptual Criticism

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It is equally deadly for a mind to have a system or to have none. Therefore, it will have to decide to combine both.
Frederich Schlegel (1798)

Each member of society can have only a small fraction of the knowledge possessed by all, and each is therefore ignorant of most of the facts on which the working of society rests ... civilization rests on the fact that we all benefit from knowledge which we do not possess. And one of the ways in which civilization helps us to overcome that limitation on the extent of individual knowledge is by conquering ignorance, not by the acquisition of more knowledge, but by the utilization of knowledge which is and which remains widely dispersed among individuals.
F.A. Hayek, *The Use of Knowledge in Society* (1945)

I put a picture up on a wall. Then I forget there is a wall. I no longer know what there is behind this wall, I no longer know there is a wall, I no longer know this wall is a wall, I no longer know what a wall is.
Georges Perec, *Species of Spaces and Other Pieces* (1974)

A theorist is one who has been undone by theory.
Irit Rogoff, *From Criticism to Criticality* (2003)

What would it mean to be a 'Conceptual critic'? To conceive of ideas and methodologies as 'emblems' and thereby create an *ars combinatoria* for the generation of theory? To investigate how meaning works

through 'playing' with science, as Roland Barthes suggests, 'like a gadget'?[1] This paper attempts such an experiment, exploring design, research and theory subjected to *transverse epistemologies* - a 'flow of transformations' through processual themes such as authorship, remediation, experience design, and smuggling, overflowing into political and philosophical areas such as social intervention, disruptive innovation, performative knowledge, gesture versus identity. I argue that 'trans-disciplinary' methodologies require a liminal, 'neither/nor' mindset, and this leads me to the central theme of the paper: boundary concepts. How should one identify the appropriate 'boundaries' of a given design or critical practice? What if each 'context' has become a moving target? Swept along on each current of inquiry, my aim is not to nail such concepts to the wall of reason with the hammer blows of scholarly argumentation, but rather to set a number of related themes rippling beneath the cool gaze of the reader.[2]

My stated concern is with 'neither/nor' logic - *between*, *across*, and *beyond* existing disciplines - and this implies in turn a concern with 'relationality' (i.e. *how* we establish relations, positions, borders between different disciplinary themes and methods) and thus the nature of distinction itself. Yet to distinguish (and thereby establish relations *between*) entities, obliges us to confront a problem that is both ancient and contemporary, that affects the way we think of disciplinarity, interdisciplinarity, networks of various kinds, and transdisciplinarity - namely the problem of 'substance' ('content' or 'matter'). What

is the fundamental property of, say, a creature, a subject, or the world itself that allows us to categorise matter within such terms? The answer is less likely to be found in the fact *that* a thing exists (a dodo, decision theory, or 'Planet Earth') than in *how* it works. The critic, curator, and systems theorist Jack Burnham anticipated the point in his 1968 essay 'Systems Esthetics':

Increasingly 'products' - either in art or life - become irrelevant and a different set of needs arise: these revolve around such concerns as maintaining the biological livability of the earth, producing more accurate models of social interaction, understanding the growing symbiosis in man-machine relationships, establishing priorities for the usage and conservation of natural resources, and defining alternate patterns of education, productivity, and leisure. In the past our technologically-conceived artifacts structured living patterns. We are now in transition from an object-oriented *to a* systems-oriented *culture. Here change emanates, not from things, but from the* way things are done.[3]

The paradigm shift that Burnham identifies from object to system is representative of a broader transition between major scientific, technological, artistic and theoretical concepts over the last fifty years or so, and corresponds to the 'morphological development' of such concepts that Thomas Kuhn has described in *The Structure of Scientific Revolutions* (1962). In what follows I will try to tease out some of the implications of this for architecture, design, and our relation to the notion of disciplinary identity.

A series of transformations
In opposition to what he characterises as a 'desperately static' view of architecture, one that regards buildings as inert masses of intention and execution, Bruno Latour argues that we should learn to look at architecture as a 'flow of transformations […] as movement, as flight, as a series of transformations'. Everybody knows, he claims, (and especially

architects) that a building is 'not a static object but a moving project, and that even once it has been built, it ages, it is transformed by its users, modified by all of what happens inside and outside, and that it will pass or be renovated, adulterated and transformed beyond recognition'.[4] He concludes: 'Only by generating earthly accounts of buildings and design processes, tracing pluralities of concrete entities in the specific spaces and times of their co-existence, instead of referring to abstract theoretical frameworks outside architecture, will architectural theory become a relevant field for architects, for end users, for promoters, and for builders.'[5]

The question is: What should we expect from such 'earthly' accounts? What details, facts, atmospheres or affects should be included? To give an account of a *coming-into-being* - be it a person, a building, a process, or a nation - involves the problem addressed so memorably by Lawrence Sterne in *The Life and Opinions of Tristram Shandy*, namely, how far back should one trace a line of implied or assumed 'cause and effect' to understand the 'context' in which a new entity came into being?[6] And what of the 'earthliness' of these accounts? Are they swarming with 'angry clients and their sometimes conflicting demands […] legal and city planning constraints […] budgeting and the different budget options […] the logistics of the many successive trades […] the subtle evaluation of skilled versus unskilled practitioners […] the continuous demands of so many conflicting stakeholders - users, communities of neighbors, preservationists, clients, representatives of the government and city authorities', all the details that Latour finds lacking from the typical dehumanised renderings of 3D-CAD architectural fantasies?[7] Does this clamour from the real world make the representation more plausible, persuasive - in short, more 'real'? Or is this demand for greater 'authenticity' not part of the problem? Donald Preziosi writes that when 'seemingly secure oppositions between what we might want to believe are fact and fiction; history and poetry; reason and

emotion' are exposed by artifice, and particularly by what Plato called the pantomimic or mimetic arts, as 'circumstantial and mutable effects of human artistry', there are repercussions for the way we conceptualise 'primary' and 'secondary' conceptual orders:

If we believe that a particular made thing 'represents' some essence (either metaphorically 'contained' in some thing or absent and elsewhere - the 'soul' or 'spirit' of its time and place), then it is obvious that the essence purportedly 'represented' may be represented in other ways, problematising the existence of that essence itself. Leading one to imagine that the essence supposedly represented is in fact created by its so-called 'representation'. Such an awareness obviously has the potential to undermine the claims of any political or religious power to security and truth.[8]

Alongside conceptual orders, the same considerations can be applied to the formulation of 'primary' and 'secondary' professional roles - artist and critic, for example, or 'designer' and 'user'. If design is an actualisation of critical practice, the breathless arrival of design criticism 'after the event' becomes a form of *ekphrasis* around an abandoned site - the critical equivalent of the 'utterly unrealistic' Euclidian space of 3D-CAD rendering that so provokes Latour.[9] This is to dissolve boundaries between practitioner and theorist, a separation that at various epochs has served both interest groups, allowing them room to manoeuvre in relation to changing configurations of power. 'One of the invidious tests in the academy for whether a notion or a practice has any value,' Victor Vitanza writes, 'is whether or not it can be generalized (is generic, accountable) and whether or not it is transferable (codifiable, teachable). All of Socratic and Platonic thinking (dialectics) deals with the central question of whether or not something (justice, piety, virtue, rhetoric, etc.) can be taught. If not, then, it is a mere knack, irrational, and thus left to the forces of chance.' Believing that we

are today 'far from being ruled by this kind of thinking', Vitanza adds, 'Not all knowledge is objective; much is personal knowledge, as Michael Polanyi says: We can know a great deal more than we can articulate. Not all knowledge is to be determined by *physis* or *nomos* but also by *kairos*, which as Eric C. White reminds us is a principle of "spontaneity and risk".'[10]

Michael Speaks's notion of 'design intelligence' - defined as 'practices [that] allow for a greater degree of innovation because they encourage opportunism and risk-taking rather than problem solving'[11] - demands a new kind of synthetic imagination, one that can be seen in the increasingly interdisciplinary ways of working of many contemporary artists, architects, and designers drawing on shifting constellations of art, science, the humanities and technology. Design tools and methodologies are being transformed in the pursuit of new areas of relevance, which makes significant demands on our critical resources. Previous concerns with origin, intentionality, agency and accountability, for example, are less likely to be illuminating when applied to cultural production characterised by 'post-human' creativity or a computer manifesting complex adaptive behaviours. Should then we *adapt* our existing critical tools - by focusing, for example, on the *visual* aspect of a genre such as 'evolutionary' design, or asking film animators to discuss the aesthetics of motion, or asking designers of interactive interfaces to evaluate the interactive experience of users in other fields? Such approaches, while useful for specific purposes, are of somewhat limited significance. As Stephen Wilson observes, 'literacy' is a key problem in 'information arts' fields - artists, audiences, art historians and critics alike will need to learn about the research areas that this work explores.[12] Just like early computer art pioneers such as Herbert W. Franke, Charles Csuri and Kenneth Knowlton, many current 'metacreationists' or 'information artists' (in the absence of more compelling descriptive tags) are interested not so

much in the final image or artefact produced, but rather in devising abstract generative processes, new kinds of artistic skills involving the development of innovative algorithms, and understanding and experimenting with organic matter such as cell manipulation or working with the constraints and possibilities of genetic materials. So this 'art of managing complexity', made necessary when formerly distinct disciplines not merely co-operate (as in interdisciplinarity), but merge to form new disciplines (as in transdisciplinarity), puts a strong emphasis on the 'appropriateness' of the methodologies and forms of communication used to connect ideas from distinct fields. We can learn from theories of metaphor and analogy in this respect.[13] But the notion of *transverse epistemologies* designates not so much a confluence of methodologies as an epistemological displacement from one area of relevance to another - that is to say, a rhizomic praxis of 'linking', 'seeing connections', generating 'networks' to arrive at new knowledge - requiring, in turn, theories of 'edges', 'borders', 'slippage' and 'distinctions' (otherwise *how* can we know *what* we are linking?). Such concepts imply a notion of a boundary or edge condition of 'substance' ('content' or 'material') - the 'matter' between which we are seeking to operate our conceptual looms and weave our connective threads. To work the space *between* disciplines, we may have recourse to liminal thinking - paradox and contradiction, epistemic control and release.

Or perhaps we look elsewhere for liminal metaphors and analogies - instead of curating, for example, with its assumption of framing value in sanctioned or quasi-institutional settings, we might explore the implications of a less familiar analogy, such as that of 'smuggling' (as Irit Rogoff proposes):

Smuggling operates as a principle of movement, of fluidity and of dissemination that disregards boundaries. Within this movement the identity [sic] *of the objects themselves are obscured, they are not visible, identifiable. They function very much like concepts and ideas that inhabit space in a quasi legitimate way. Ideas that are not really at home within a given structure of knowledge and thrive in the movement between things and do not settle into a legitimating frame or environment. The line of smuggling does not work to retrace the old lines of existing divisions - but glides along them. A performative disruption that does not produce itself as conflict.*[14]

In the project *Parcel*, by the architectural research group KRETS (based in Stockholm, Sweden, and affiliated both to AKAD, the Academy for Practice-Based Research in Architecture and Design, and the architectural group SERVO), we find a parallel process.[15] Seeking new ways of establishing relations between everyday materials, audiovisual and digital technologies, the investigations of KRETS led them to the use of ink, not as a conventional tool of architectural representation (the artisan's authentic mark, or the genius's moody spatter across the drawing table), but as a potential means of transmitting electricity and signals between circuits.[16] A repurposing of methodologies from other disciplines or practices, *as well as* the materials themselves, becomes characteristic of design strategies that pursue a constellation of hybrid techniques while yet seeking to innovate through the selection and adaptation of existing forms. Bolter and Grusin use the term 'remediation' to describe this process:

[W]e call the representation of one medium in another remediation, and we will argue that remediation is a defining characteristic of the new digital media. What might seem at first to be an esoteric practice is so widespread that we can identify a spectrum of different ways in which digital media remediate their predecessors, a spectrum depending on the degree of perceived competition or rivalry between the new media and the old.[17]

Information here is understood as 'difference' in

an otherwise homogenous (and thus meaning-less) system; it may concern reformulating an existing problem, applying a technology in a way previously unforeseen, combining the metaphors and references of one community of practice with the products of another to create a third, separate system, and so forth.[18]

Some may prefer to reformulate the question by considering instead the difference between discipli-nary *identity* ('I am an architect') and *gesture* ('Je est un autre', in Rimbaud's famous phrase), a distinction that may be central to disciplinarity's epistemologi-cal stranglehold on our imaginations. Architecture delineates a broad sphere of practice; architects are (among other things) negotiators par excel-lence, needing to communicate successfully with a wide range of stakeholders (including engineers in all their guises, politicians, economists, urban plan-ners, environmentalists, interior designers, artists, management consultants, business professionals, facility managers, lawyers and so forth).[19] What does it take for such a fragmented practice to congeal around a core disciplinary identity?[20] One answer might be: the capacity to interact at the level not of *substance* (depth, weight, disciplinary speciali-sation etc), but of *gesture* (the ability to express and negotiate - or modulate - Latour's 'context-in-flight'). Gesture is here conceived as an essentially performative mode, an escape from the 'anxiety of influence' that seems bound to any consideration of biological, cultural and historical 'identity'. The Czech novelist Milan Kundera explores this insight-fully in his novel *Immortality*: 'If our planet has seen some eighty billion people,' he writes, 'it is difficult to suppose that every individual has had his or her own repertory of gestures. Arithmetically, it is simply impossible. Without the slightest doubt, there are far fewer gestures in the world than there are individu-als. That finding leads us to a shocking conclusion: a gesture is more individual than an individual. We could put it in the form of an aphorism: many people, few gestures.' If we follow the implications

of this line of reasoning, we must line up alongside Marco Steinberg in noting that 'academia is going to have to challenge itself to define the right frame-works, incentivizing students and faculty to work in ways that may inherently contradict the established structures of success. The institutional dilemma is that with success comes rigidity towards change. The future will be in the hands of those whose past success won't create an insurmountable barrier towards rethinking how they operate in this design driven age.'[21]

Origins / Repurposing

In the modern period, the ability to design something 'deliberately' and 'at will' implies that such skills can be taught, passed on via courses, apprenticeship or some other pedagogic technique. An artefact with an identifiable origin (or set of origins, as in the case of design teams working on component parts) usually has been made for a purpose, and its performance in serving that purpose is the designer's respon-sibility. The dispersed or fragmentary modes of production of many contemporary practices unravel this binding of artefact to origin. Consider owner-ship rights in science, for example. These are today typically dispersed across a paradigm of multiple authorship, 'a fragmentation of scale undreamed of even a generation earlier' (according to Biagioli and Galison), one that furthermore demands that collaborators devise 'increasingly more elaborate systems to integrate their subgroups and partici-pants into a whole':

How do we distinguish who or what is an author in such collaborations? Defining the author is an ever more difficult, tricky business as increasingly specialized and interdisciplinary work casts author-ship in a different light within the diverse species of Big Science. Academic laboratories, nuclear weapons laboratories, and industrial sites all carry dramatically different, if not contradictory, values of openness, secrecy, publication, and credit. Accord-ingly, each develops its own, often divergent,

standards of authorship.[22]

Contemporary cultural production similarly often involves designers and non-designers collaborating with materials and tools that are typically different and sometimes incompatible. In the process conventional roles such as producer and client, architect and engineer, as well as existing distribution models are reconfigured. New media theorist Lev Manovich goes so far as to propose that the medium may now have eclipsed the message - film editing software, for example, may now have surpassed the output of the avant-garde *auteurs*: 'The greatest avant-garde film is software such as Final Cut Pro or After Effects which contains the possibilities of combining together thousands of separate tracks into a single movie, as well as setting various relationships between all these different tracks - and it thus develops the avant-garde idea of a film as an abstract visual score to its logical end, and beyond.'[23] The American filmmaker and activist Craig Baldwin cuts, splices, mixes and edits his films almost entirely from samples recycled from the twentieth-century image-reservoir of film and television, particularly science fiction and fantasy B movies, as well as (what he calls the 'touchstones of surrealistic magic') ethnographic, documentary, and educational films. This mode of production has obvious affinities to the sampling and recycling culture of hip-hop.[24] Yet many contemporary artists, architects and designers are less concerned with the logic of origins (resemblance, reproduction, representation as well as their satellites such as agency, ownership and intentionality) than with manipulating (or 'hacking') the 'source code' of media itself to create 'new media'. In his version of Dolly Parton's version of *The Great Pretender*, for example, John Oswald, Plunderphonics founder, does not merely sample, alter, add to, and/or subtract from the original recording - in fact, Oswald does not alter the original in any way, with the exception of one of its many parameters.[25] What we hear is a recording of Oswald playing Parton's track all the way through,

but transformed via vari-speed media - first, via a high-speed cassette duplicator, then an infinitely variable speed turntable, and finally a hand-controlled reel-to-reel tape, all seamlessly edited together. Aside from this performance of controlled deceleration and re-acceleration, the original recording remains untouched. Yet while the integrity of the source material is respected - only its pitch is altered through changes in speed - the interpretation and 're-presentation' of the material is clearly the result of Oswald's compositional intention, technical skill and artistic vision. Thus a new composition is created with its own logic, structure, sensuous tones and humorous or despondent pleading between male and female rivals for the same lover (thereby foregrounding the sexual insecurity or ambiguity of the original).[26] Oswald uses the media of vari-speed recording devices as tools for a performance that blends interpretation and authorship to the extent that the distinction ceases to make any meaningful sense. Interdisciplinary artists, architects and designers similarly appropriate and recontextualise ideas, discourses, forms and methods from other practices, letting the specific project determine the applicability and relevance of the materials, references and discourses adopted, rather than any real or imagined affiliation to disciplinary or institutional authority. Such practitioners provide strategies for managing the uncertainty of practice within a research context. But because they do not operate within a zone of ethical, political and philosophical neutrality, their assumed pragmatism also requires critical self-reflexivity.

Experience Design / Disruptive innovation
Design, then, has taken over the mantel from conceptual art in exploring the implications of shifting focus from the 'object' (artefact, collection or archive - library or database), towards 'information', including the question how expertise is 'actualised' (performed, articulated) *in practice*. This may well include an element of interpreting, adapting and applying information stored in various collection

systems (historical, methodological, educational or technical archives), but it also involves the imperative to communicate a meaningful experience in (or across) time. Such expertise is simultaneously 'situated', 'embodied', 'connective' and 'performative'; that is to say it draws on both practical as well as highly theoretical knowledge. To change the terms by which we describe (and conceive of) our various knowledge concepts is not a mere academic fad or philosophical whim; it affects the way we set about 'problem-solving' - or, if we might raise our level of ambition, 'disruptive innovation'.

The shift from 'object-based' to an 'information-based' culture demands that we reconsider the role of art, craft and design within such a culture. Towards this end, faculty at the Department of Inter-disciplinary Studies at Konstfack in Stockholm, led by Professor Ronald Jones, have over the past two years been developing a unique perspective on an emerging discipline - that of Experience Design. Experience Design is here conceived not as a means towards understanding and improving so-called 'user experience' of designed products, processes, services, events and environments, but as the design of human experiences over time with real and measurable consequences, thereby 'to persuade, stimulate, inform, envision, entertain, and forecast events, influencing meaning and modifying human behavior'.[27] Industry's deepening appreciation of consumer preference for experience over more traditional commodities, coupled with the 'dematerialization of the art object', in Lucy Lippard's phrase, are taken as indicators of the paradigm shift already mentioned - here, the privileging of 'experience creation' over object-making.[28] Such a shift highlights the need to investigate what new relevance experience-based culture can bring to established disciplines such as those within art, craft and design. While existing approaches to Experience Design have spanned areas as diverse as entertainment design, lifestyle design or web design (with the aforementioned 'user' focus), we prefer to

emphasise designing 'experience' itself - this, in our formulation, is inseparable from designing 'time'. So we design 'meaningful experience' over (or across) 'time'. This means that 'time' itself is our designers' primary 'media'. Experience + time requires a systems approach, integrating perspectives from the likes of psychology, phenomenology, interactivity, narrative (story telling), performance studies, architecture and dance. Our designers of experiential systems accordingly develop a narrative and/or performative approach to time, supported by the skills and methods of the established design disciplines informed by research from the humanities and natural sciences. This is a form of design as social intervention - or (the phrase we prefer) 'disruptive innovation'. Here's Burnham again from 1968:

The priorities of the present age revolve around the problems of organization. A systems viewpoint is focused on the creation of stable, on-going relationships between organic and nonorganic systems, be these neighborhoods, industrial complexes, farms, transportation systems, information centers, recreation centers, or any of the other matrices of human activity. All living situations must be treated in the context of a systems hierarchy of values. Intuitively many artists have already grasped these relatively recent distinctions, and if their 'environments' are on the unsophisticated side, this will change with time and experience.[29]

In a recent article on how designers are adopting the strategies of conceptual art, Ronald Jones cites Robert Pincus-Witten's distinction between ontological Conceptualism (advanced by Joseph Kosuth, among others, as an assault on art's very identity) and epistemological Conceptualism, which Pincus-Witten characterises as making or doing things 'for the kinds of information, knowledge or data which things or activities reveal' - in other words, an emphasis on the experience of knowledge production rather than its ontological end. Citing the increasing value of experiences over commodities

in the entertainment, airline and sports industries, as identified already in B. Joseph Pine II and James H. Gilmore's (1998) article 'Welcome to the Experience Economy', Jones comments:

[T]he potential of this methodology to design experiences in order to project power and influence has been consistently underappreciated by artists, especially when compared with contemporary designers who co-opted epistemological Conceptualism as a platform for designing the experiences of knowledge production, reception and comprehension across disciplines - often furthest from their own - affording them an expanding sphere of influence. [...] The customization of epistemological Conceptualism represents the most significant paradigm shift in living memory, as design professions migrate from myopic design assignments - design me a toaster - towards conceiving the intangible commodities that feed the experience economy - design me a system.[30]

The demand for a system over an object recalls 'Systems Esthetics', in which Burnham stated:

The systems approach goes beyond a concern with staged environments and happenings; it deals in a revolutionary fashion with the larger problem of boundary concepts. In systems perspective there are no contrived confines such as the theater proscenium or picture frame. Conceptual focus rather than material limits define the system. Thus any situation, either in or outside the context of art, may be designed and judged as a system. Inasmuch as a system may contain people, ideas, messages, atmospheric conditions, power sources, and so on, a system is, to quote the systems biologist Ludwig von Bertalanffy, a 'complex of components in interaction', comprised of material, energy, and information in various degrees of organization. In evaluating systems the artist is a perspectivist considering goals, boundaries, structure, input, output, and related activity inside and outside the system. Where the object almost always has a fixed shape and boundaries, the consistency of a system may be altered in time and space, its behavior determined both by external conditions and its mechanisms of control. [...] [A] system esthetic is literal in that all phases of the life cycle of a system are relevant. There is no end product that is primarily visual, nor does such an esthetic rely on a 'visual' syntax. It resists functioning as an applied esthetic, but is revealed in the principles underlying the progressive reorganization of the natural environment. [My emphasis][31]

Architects, as has been noted, excel at designing systems, but Jones's point is applicable more widely than to the practice of architecture as conventionally conceived - it is the belief that 'designers should be critical thinkers and strategists first, capable of addressing cross-disciplinary problems by designing the social, political, economic and educational "systems" that give them greater reach, responsibility, influence and relevance'.[32] This is a more expanded role for the designer than simply that of problem-solver (with its associations of intervention in localised situations of intellectual spillage or accident); the problem-solver typically works within prescribed limits - 'fix it and be gone!' - while experience designers are required to synthesise a broad range of information from a diverse range of knowledge traditions. Even a 'simple' experience design project, for example, would likely involve research-related activities spanning behaviour that can be classed as teleological ('goal seeking'), conceptual, analytical, evaluative, quantitative, qualitative, hermeneutical ('interpretative'), generative, explorative and so forth. Each activity produces its own class of outcomes that need to be synthesised without damaging the integrity of the findings or the coherence of the experience design project as a whole.

This, then, is one reason why architecture may be a useful analogy to a nascent field such as that of

experience design. Both sets of designers increasingly face problems that are neither predictable nor simple, but rather highly complex. As a result, as Julie Klein has noted, 'the art of being a professional is becoming the art of managing complexity'.[33] In both cases (architecture and experience design), as in transdisciplinary practice-based research more generally, a particular synthesis of design intelligence and creativity is required. We have already mentioned Michael Speaks's notion of 'design intelligence'. The three types of creativity identified by Margaret Boden - combinatorial, exploratory, and transformational creativity – also help outline the particular style(s) of thinking involved:

Combinatorial creativity involves the generation of unfamiliar (and interesting) combinations of familiar ideas. […] Exploratory and transformational creativity are different. They're both grounded in some previously existing, and culturally accepted, structured style of thinking - what I call a 'conceptual space'. […] In exploratory creativity, the existing stylistic rules or conventions are used to generate novel structures (ideas), whose possibility may or may not have been realized before the exploration took place. […] It can also involve the search for, and testing of, the specific stylistic limits concerned. Just which types of structure can be generated within this space, and which cannot? Transformational creativity is what leads to 'impossibilist' surprise. The reason is that some defining dimension of the style, or conceptual space, is altered - so that structures can now be generated which could not *be generated before. Imagine altering the rule of chess, which says that pawns can't jump over other pieces: they're now allowed to do this, as knights always were. The result would be that some games of chess could now be played which were literally* impossible *before. The greater the alteration, and the more fundamental the stylistic dimension concerned, the greater the shock of impossibilist surprise.*[34]

In the *ars combinatoria* of 'Conceptual criticism' with which I began this discussion, as in transdisciplinary practice and the notion of 'disruptive innovation', Boden's three types of creativity - combinatorial, exploratory, and transformational - come together to generate new structures that, as described above, *could not* be generated before. It is the purpose of the next section to explore *why* this might be important.

Managing complexity / Disruptive innovation: the 'secret bridges' between knowledge

Certain problems or challenges (poverty, space exploration, health, security, play, for example) exceed the reach of any single conventional discipline and therefore require a co-ordinated, synthesising approach. 'Society has been served well by the pursuit of deep knowledge (the cornerstone of any self-respecting academic institution),' Marco Steinberg writes, 'but more and more the nature of today's "big picture" problems resides at the intersection of what we know. What is - for example - healthcare? It's not medicine, law, buildings, therapies, doctors, processes, ethics, or business but rather the convergence of all of them in a complex system. We need to first see the nature of these system problems to define the path towards more complete solutions. Not reductively, not as fragments, but in the complex, integrated and synthetic ways that drive them. These are the cornerstones of design, yet it's not design as defined by our professions, rather design as defined by our needs.'[35] These 'big picture' problems are typically engaged through transdisciplinary approaches. The Academy for Transdisciplinary Learning and Advanced Studies (ATLAS) states:

In following the transdisciplinary concept, researchers representing diverse disciplines work jointly to develop and use a shared conceptual framework that draws upon discipline specific concepts, theories, and methods, but addresses common problems through a new synthesis of a common ontology,

theories, models, and methodology.[36]

'If joint problem solving is the aim,' Helga Nowotny notes, 'then the means must provide for an integration of perspectives in the identification, formulation and resolution of what has to become a shared problem.'[37] As the prefix 'trans' indicates, transdisciplinarity denotes that which is *between*, *across*, and *beyond* the different disciplines (or, as Diana Domingues remarks, it 'establishes the "secret bridges" between knowledge, the unknown passages of theories, the hidden shared operations in knowledge generation at microbiological levels').[38] The assumption is that the uncertain space *between* and *beyond* disciplines is a rich seam of untapped information and potential insight, not least at the methodological level. At the same time, disciplinary research is not eclipsed or rendered obsolete by transdisciplinary research; rather the two approaches complement and clarify each other.

For designers, establishing the limits of professional practice must remain an open question. The designer who sets prescribed limits to his or her field of operations runs the risk of irrelevance in a rapidly changing economic climate. What, however, would it mean to design a genuinely transdisciplinary curriculum? What type of problems would such transdisciplinarians choose to address, using what synthesis of methods and materials? Would they even be considered designers, as we understand the term today?[39] In the logic of disciplinary identity - the partitioning of appropriate topics, references and methods, the opposition, juxtaposition, or integration of theory and practice, the inclusion and exclusion of categories, their 'binding' and dissemination - we see the power of the *how* alongside that of the *what* in the formation of disciplinary 'substance', 'content' or 'matter'. In his essay 'Borges and Conceptual Art', Gregory Ulmer writes: 'We have come around at last to the same relation between theoretical or pure research and applied knowledge that exists in many other disciplines. One consequence of this shift, best exemplified in the work of the Tel Quel group in Paris, is the creation of an interdisciplinary genre in which theory precedes practice, which is a theoretical praxis. With this praxis criticism joins the vanguard - it is theory oriented towards the future of art, which concerns itself with the modes of art yet to be realized as well as with those now past.'[40]

We see an increasing number of disciplines that have been formed around no conventional 'content' per se: logistics, statistics, game theory, network theory, decision theory and so on.[41] What might we call the pursuit of unknowing, or *not* knowing? Is it a discipline, as George Steiner has claimed, of 'respect' in front of what the questions really are? And, if so, is such respect also the defining feature of our relation to 'higher' perspectives - the 'non-earthly' in contrast to the 'earthly' accounts that Latour called for - such as those promised both by religion and philosophy - that is to say a respectful acknowledgement of our extremely limited human capacity for understanding?

Let us take, as a final example, the Swedish artist duo Bigert and Bergström, whose project *Everybody Talks About the Weather, but Nobody Does Anything About It* (2007), dabbles in the stuff of weather itself, using dry ice to puncture a hole in a cloud and thereby produce 'physical nothingness'. Thus do we confront the question of 'substance' directly, while also circling back to our initial question of boundary concepts (i.e. what are the 'boundaries' of a given practice?) - to modify the weather may seem to be the work of, if not an *auctor vitae*, at least a pair of seriously over-extended egos. 'Cloud seeding' (to give the technique its official name) has been of considerable interest since the Second World War to the US Air Force as a means of weather control for military offensive purposes, as Ronald Jones has chronicled in his essay 'A gun in a knife fight'. But it is also worth remarking that projects such as *Everybody Talks About the Weather, but Nobody*

Does Anything About It reveal a shift in roles (a shift we find in bio-art too) from art as mere imitation of nature to nature as the material for artwork. Here then is one interesting problematisation of the concept of 'substance' - for, as Jones points out, what links both bio-art and Bigert and Bergström is (once again) a contested connection to 'the real':

The desire to transform the natural world as a work of art is an affinity Bigert and Bergström share with Steven Kurtz and other bioartists whose field has grown in direct proportion to advances in biotechnology. Controversial and topical subjects - genetically altered plants and animals, cloning - are bioart subjects and like environmental modification, whether for art or war, they are not only relevant subjects but they are real. *They are* more real *than Chris Burden's 747, 1973 where he took ritualized 'what if' pistol shots at a 747 departing Los Angeles International Airport. And where Burden never had to face up to culpability and catastrophe, for Kurtz, Bigert and Bergström it is unavoidable.*[42]

Is a discipline of unknowing, or not-knowing, rather a form of intellectual 'cloud seeding' whereby we risk facing, either when we return to earth or soar above the fog in our military-sourced hardware, a major epistemic hole of our own devising? One of the pioneers of systems applications, E. S. Quade, stated that 'Systems analysis, particularly the type required for military decisions, is still largely a form of art. Art can be taught in part, but not by the means of fixed rules...'[43] We might turn this the other way around and ask (as does Latour) why our art critics and humanities scholars have failed to revise their methodologies and learn from other forms of practice in the way that military planners, for example, routinely undertake; 'military experts constantly revise their strategic doctrines, their contingency plans, the size, direction, technology of their projectiles, of their smart bombs, of their missiles: I wonder why we, we alone, would be saved from those sort of revisions. It does not seem to me that we have been

as quick, in academe, to prepare ourselves for new threats, new dangers, new tasks, new targets.'[44]

A cautionary word to end: the concepts foregrounded in this essay - blurrings of boundaries, indistinctness, gesture, the 'trans' prefix as calculated epistemological slippage, and so forth - are admittedly seductive, not least (I have discovered) to architects, perhaps because they seem to promise imaginative emancipation and 'delirious' self-invention. This promise is at best deceptive - adaptable to emancipatory and reactionary ends equally. Bertold Brecht's warnings, issued from 1934 Germany in 'Writing the Truth: Five Difficulties', remain valid today, applying not only to writers, but to designers of experiential systems of all types. Thus I choose to close by recalling Brecht's words:

Nowadays, anyone who wishes to combat lies and ignorance and to write the truth must overcome at least five difficulties. He must have the courage to write the truth when truth is everywhere opposed; the keenness *to recognize it, although it is everywhere concealed; the* skill *to manipulate it as a weapon; the* judgment *to select those in whose hands it will be effective; and the* cunning *to spread the truth among such persons.*[45]

Notes

1. Barthes writes 'la modernité est essayée (comme on essaye tous les boutons d'un poste de radio dont on ne connait pas le maniement)', *Roland Barthes par Roland Barthes* (Paris: Seuil, 1975), p. 78. Cited in Gregory L. Ulmer, 'Borges and Conceptual Art', *boundary* 2, 5, 3 (Spring 1977, Duke University Press), pp. 845-62 (p. 854).
2. Compare the gaze of the ice fisherman or woman - the *vintermetare* or *pimplare* in Swedish - poised in the dark above the ice hole they have bored, ready to strike with spear or rod when their prey finally swims within sight; it is a gaze of keen concentration despite the demands of the monotonous vigil - hence 'cool'.

3. Jack Burnham 'Systems Esthetics', Reprinted from *Artforum* (September, 1968), http://www.arts.ucsb.edu/faculty/jevbratt/readings/burnham_se.html [accessed 18 March 2009].

4. An example, already mentioned, is that of *parkour*, or *l'art du déplacement*, whereby the urban landscape - irrespective of the original purposes of its component buildings and structures - becomes a series of obstacles or facilitators of human movement. According to David Belle, one of the founders of *parkour*, 'the physical aspect of parkour is getting over all the obstacles in your path as you would in an emergency. You want to move in such a way, with any movement, as to help you gain the most ground on someone or something, whether escaping from it or chasing toward it'. From 'Cali meets David Belle', http://www.pkcali.com/parkour_plugins/content/content.php?content.8 [accessed 18 March 2009].

5. Bruno Latour and Albena Yaneva, 'Give me a Gun and I will Make All Buildings Move: An ANT's View of Architecture', in *Explorations in Architecture: Teaching, Design, Research*, ed. by Reto Geiser (Basel: Birkhäuser, 2008), pp. 80-89. Available online: http://www.bruno-latour.fr/poparticles/poparticle/P-138-BUILDING-VENICE.pdf [accessed 18 March 2009].

6. As one example, Simon Barraclough's poem 'Bounded in a Nutshell' (2008) seeks to trace the material and resonant origins of a performance space by imagining the concert hall of Kings Place unfolding ('as history hurtled by') from 'a German acorn sweetened on the branch / until it reached its crucial mass / and blew the bolts to give itself to gravity', through 'six thousand moons', until fully grown and cut into 'an acre of veneer / to line this room, this snug nutshell, replanted in the earth / in which we sit and feel the taproot of the bass notes shift, / hear sonic tendrils lift.' Published online, http://www.guardian.co.uk/global/2008/oct/21/poetry-architecture-hardy-larkin-betjeman [accessed 18 March 2009].

7. Latour and Yaneva, 'Give me a Gun', p. 81.

8. Donald Preziosi, 'Afterword: Artifice and Interactivity', *media-N*, Fall 2006, 2, 3, on the theme 'Art in the Age of Technological Seduction'. Available on-line: http://median.shiftingplanes.org/issues/html_only/2006_fall/media_N_S2006v2n3.pdf [accessed 18 March 2009].

9. Latour and Yaneva, 'Give me a Gun', p. 81.

10. Victor J. Vitanza, 'Writing the Paradigm', review of Gregory L. Ulmer's *HEURETICS: The Logic of Invention* (1996). Available: http://www.altx.com/EBR/EBR2/R2VITANZA.HTM [accessed 18 March 2009].

11. Michael Speaks, 'Theory was interesting . . . but now we have work', *Architecture Research Quarterly*, 6, 3 (September 2002), pp. 209-12.

12. Stephen Wilson, 'Artificial Life and Genetic Art', in *Information Arts: Intersections of Art, Science, and Technology* (Cambridge, Mass.: MIT Press, 2002), p. 364.

13. See, for example, Jon Cook, 'Reflections on Metaphor', in *The Book of Models: Ceremonies, Metaphor, Performance*, ed. by Rolf Hughes and John Monk (Milton Keynes: Open University, 2003).

14. Irit Rogoff, '"Smuggling" - An Embodied Criticality'. Available online: http://eipcp.net/dlfiles/rogoff-smuggling [accessed 18 March 2009].

15. AKAD: http://www.akad.se; SERVO: http://www.s-e-r-v-o.com/ [accessed 18 March 2009].

16. 'With *PARCEL*, the research group Krets installs a three-dimensional intelligent wall panel system. PARCEL suggests new ways of establishing relations between the material, audiovisual and digital techniques that are increasingly forming the environments around us. The project considers off-the-shelf technologies normally used in the packaging industry and consumer electronics as integral parts of an architectural design. Punched plastic sheets equipped with computational intelligence through microprocessors, printed circuits, and variations of sensors, lighting and speakers, are folded into volumes. When combined they form a wall-panelling system integrating information technology and infrastructure as well as illumination and sound. The folded sheets create depth from surface and respond to the color scheme of the Stockholm Concert Hall. The rendering of the color shifts as a result of the inherent curvature in the pieces and the integrated light. The formal logics of the PARCEL prototypes are imported from printed matter and disposable articles, transfer-

ring their qualities to an interior scale. The material and immaterial aspects of PARCEL suggests a light mode of operation, where the ambience of an environment can be shifted from one moment to the next.' From http://www.akad.se/krets.htm [accessed 18 March 2009].

17. Jay David Bolter and Richard Grusin, *Remediation: Understanding New Media* (Cambridge, Mass.: MIT Press, 1998), p. 45.

18. In *Difference and Repetition*, Deleuze defines 'repetition' as an idea that 'cannot be exchanged' and is therefore 'singular'; he contrasts this idea with the notion of the 'particular,' which he relates to an exchangeable generality that is obedient to the law. Repetition emerges singularly and resists the idea of generality/law, which enables the operations of comparison and analogy. Repetition does not entail consciousness and memory, but rather is manifested with intensity. In other words, when one is in the state of repetition, it is impossible to be aware of or to report one's state. This would seem to have implications for one's critical capacities within an acquired disciplinary mindset. Deleuze claims that repetition can only be recalled from the perspective of the future, that is, as recollection. Since repetition is unexchangeable, it is unrepresentable; it is a singular event which speech inevitably fails. For a more detailed discussion of the concept of repetition with reference to the 'singular' and 'particular', see Gilles Deleuze, *Difference and Repetition*, trans. Paul Patton (London & New York: Continuum, 2004) (especially 'Introduction: Repetition and Difference' and Chapter 2: 'Repetition in Itself').

19. Dagny Stuedahl makes a similar point in his paper 'Designing as Performance': 'By integrating […] contextual and multidisciplinary influences in the understanding of design, the design process may also be seen as a negotiation. This is a negotiation not only between professional groups or between diverging translations of the participants in the design group but between diverging sets of cultural, social and commercial values and politics. Design is the point where worlds collide and disciplinary categories dissolve and melt into new ones.' Available online: http://imweb.uio.no/seminarer/designingdesign/papers/Designing_as_

performance.htm [accessed 18 March 2009].

20. The question is explored through historical case studies by many of the contributors to *Architecture and Authorship: Studies in Disciplinary Remediation*, ed. by Tim Anstey, Katja Grillner, and Rolf Hughes (London: Black Dog Publishing, 2007).

21. Marco Steinberg, 'Systems and Systems of Change' (2008). Available online: http://www.changingthechange.org/blog/2008/06/01/systems-and-systems-of-change/ [accessed 18 March 2009].

22. Mario Biagioli & Peter Galison, 'Introduction', *Scientific Authorship: Credit and Intellectual Property in Science* ed. by Biagioli & Galison (NY and London: Routledge, 2003), pp. 6-7.

23. Lev Manovich, 'New Media from Borges to HTML', in *The New Media Reader*, ed. by Noah Wardrip-Fruin and Nick Montfort (Cambridge, Mass.: MIT Press, 2003), p.15.

24. For information on Craig Baldwin and his films see http://www.othercinema.com [Accessed 18 March 2009]. An interview with Craig Baldwin ('No Text/No Truth/Jouissance and Revolution' by Jack Sargeant) appears in *Tribulation 99*, available online at: http://www.sensesofcinema.com/contents/01/13/baldwin-revolution.html [Accessed 18 March 2009].

25. A recording is available at the time of writing on http://www.plunderphonics.com [Accessed 18 March 2009].

26. Chris Cutler's description in his essay 'Plunderphonia' is worth citing at length: 'Sounds like a dive downwards as a sped up tape slows rapidly to settle into a recognisable, slightly high-pitched Dolly Parton. It continues to slow down, but more gradually now. The instruments thicken and their timbres stretch and grow richer. Details unheard at the right speed suddenly cut across the sound. Dolly is changing sex, she's a man already; the backing has become hallucinatory and strange. The grain of the song is opened up and the ear, seduced by detail, lets a throng of surprising associations and ideas fall in behind it. The same thing is suddenly very different. Who would have expected this extraordinary composition to have been buried in a generic country song, one thousand times heard already and one thousand times copied and forgotten?' Available online:

http://kaganof.com/kagablog/2008/11/22/plunderpho-
nia-by-chris-cutler/ [accessed 24 March 2009].

27. Ronald Jones, *Konstfack Vårutställning* (Spring exhibi-
tion catalogue, Stockholm 2008).

28. Lucy Lippard and John Chandler, 'The Dematerializa-
tion of Art', *Art International*, 12, 2 (February 1968), pp.
31-36. Lippard also used the term as the subtitle of her
anthology, *Six Years: The Dematerialization of the Art
Object from 1966-72* (New York: Praeger, 1973).

29. Burnham, 'Systems Esthetics'.

30. Ronald Jones, 'Are You Experienced?', Frieze, 120
(Jan-Feb 2009). Available online: http://www.frieze.
com/issue/article/are_you_experienced/ [accessed 18
March 2009].

31. Burnham, 'Systems Esthetics'.

32. Jones, 'Are You Experienced?'.

33. Julie Klein in 'Rethinking Interdisciplinarity'. Available
online: http://www.interdisciplines.org/interdisciplinar-
ity/papers/5/7/1#_7 [accessed 24 March 2009].

34. Margaret A. Boden, 'Creativity and Conceptual Art', in
Philosophy and Conceptual Art, ed. by Peter Goldie
and Elisabeth Schellekens (Oxford: Oxford University
Press, 2007), p. 219.

35. Steinberg, 'Systems and Systems of Change'.

36. From 'Transdiscipline'. Available online: http://theatlas.
org/index.php?option=com_content&task=view&id=10
2&Itemid=82 [accessed 24 March 2009].

37. Helga Nowotny, 'The potential of transdisciplinarity', in
Rethinking Interdisciplinarity. Available online: http://
www.interdisciplines.org/interdisciplinarity/papers/5
[accessed 18 March 2009].

38. Diana Domingues and Eliseo Reategui, 'Collabo-
rative and Transdisciplinary Practices in Cyberart:
from Multimedia to Software Art installations'. Avail-
able online: http://www.banffcentre.ca/bnmi/programs/
archives/2005/refresh/docs/conferences/Diana_
Domingues.pdf [accessed 18 March 2009].

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tions of this question in practice as well as theory.

40. Gregory L. Ulmer, 'Borges and Conceptual Art', p.

858.

41. I am grateful to Professor Gerard de Zeeuw, my
colleague at Sint-Lucas School of Architecture in Brus-
sels, for sharing this observation with me at a recent
research meeting.

42. 'Indeed,' Jones continues, 'after sizing up his own culpa-
bility, the first pilot Bigert and Bergström contracted to
seed clouds with dry ice, ultimately expressed doubts
and backed out. They found another pilot. Once
engaged in practices the UN (see the United Nations
Declaration on Human Cloning) and other international
organizations have sought to proscribe, are Kurtz or
Bigert and Bergström acting as artists any longer?
And if not artists, are they more like hooligans who
know just enough about science to be dangerous? Or
are they simply artists acting immorally? Should the
right to free expression extend to artists who are self-
appointed amateurs in the realm of science? Should
free-expression, as artists understand it, be allowed
to cross over disciplines? Some say not. Kurtz was
arrested by the F.B.I. under the Biological Weapons
and Anti-Terrorism Act on charges of illegally obtaining
biological samples that could send him to prison for 20
years.' Ronald Jones, 'A gun in a knife fight', *Everybody
Talks About the Weather, but Nobody Does Anything
About It*, ed. by Bigert and Bergström (Exhibition cata-
logue, Uppsala Art Museum, 2007), p. 14.

43. Burnham, 'Systems Esthetics'.

44. Bruno Latour, 'Why Has Critique Run out of Steam?
From Matters of Fact to Matters of Concern', *Critical
Inquiry*, 30, 2. Available online: http://www.uchicago.
edu/research/jnl-crit-inq/issues/v30/30n2.Latour.html
[accessed 18 March 2009].

45. Bertolt Brecht, *Galileo*, edited and with an introduction
by Eric Bentley, English version by Charles Laughton
(New York: Grove Press, 1966); essay translated by
Richard Winston, Appendix A, pp. 133-50.

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Biography

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