

Draft paper for the conference: -

*DOCTORAL EDUCATION IN DESIGN*

Title:

**THE SCIENCE OF UNCERTAINTY:  
THE POTENTIAL CONTRIBUTION OF DESIGN TO  
KNOWLEDGE**

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*Preface*

Thought essentially as configuration or as disposition, though in ways that will have to be explored, design is difficult conceptually. As Phillippe Jullien has pointed out with respect to how we understand some similar concepts in Chinese, the term lies stranded between the over-powering distinction between things (“their condition, configuration, and structure”) and forces or effects (the processes that give to things their form and therefore also their efficacy, their implications). The dichotomy in question is, like all dichotomies, abstract and inadequate to understanding. Nonetheless, it operates to ensure that, caught between the realms of forces and consequences on the one side, and that of the facticity of objects on the other, design is consigned to inconsistency. Its location uncertain, it thus remains largely unconceptualized—even though we sense that what is at stake here is everything that really matter (particularly, it must said, in reference to the realm of the artificial, which is of course the realm of design).

*Introduction*

In this paper I would like to address the question of design knowledge, considered in the light of this conundrum and in relation to the issue we are discussing today, which I take to be the question of how there can be Ph.D’s in design at all—meaning by this last point that, for me, the issue is the double one; of whether there can be a field of knowledge which the Ph.D. in design contributes to, helps establish, places itself in dialogue with,

and, if so, what that field is, what it consists of, what it's characteristics are.

The paper will therefore try to define, albeit schematically, the nature or character of design-knowledge that Ph.D. programmes might explore. It will also try to say something about the potential contribution that this knowledge might make, at once to design's self-understanding (i.e., the self-comprehension of design; the means of how it understands what it achieves, what its activities are, how it negotiates the world, what it means *to* design) *and* to knowledge in general.

This last point is key. I see no point in trying to shape a design-knowledge that does not contribute to knowledge in general. The preface already suggests that adequate knowledge of design must find ways across some of the fundamental dichotomies that divide knowledge in general today. This immediately seems to indicate one opportunity for design knowledge. At the same time it is increasingly important to try to overcome the rampant failures of design knowledge both within and without the professional field of design. These failures are not insignificant. Though not entirely dependent on the failure by those within design to “build an intellectual tradition of substance” – since this is also a failure of other disciplines to recognize the significance of issues centrally concerned with artifice and its shaping—still the overarching intellectual condition under which we meet is less celebratory than we would wish, and not only in terms of what is absent from our own agenda, but also in relation to what Tony Fry has labeled, rightly, as the general “gross deficiency of knowledge” of the impact (and potential) of human action upon the making and unmaking of the material, symbolic and natural worlds.(Fry, 1997, 53-54) This failure design participates in. I see one potential role for the design knowledge gained through Ph.D. programmes, in helping to repair these deficiencies—though this would require, of course, programmes at least partially orientated to this end.

Keeping these points in mind—using them as in effect the critical foil through which to try to see where we are today with respect to knowledge—the argument will proceed by showing four things: -

- i. That design knowledge can be created only through utilizing models of knowledge adequate to design. If this is on one level self-evident, the argument nonetheless involves a comprehensive denial of the value of utilizing, metaphorically, other models of knowledge to model design, be they technical, semiotic, humanistic or whatever;
- i. that design involves and embeds *particular* modes of knowledge which it is the task of the Ph.D. to dis-embed, extract and translate;
- i. That the implications of this knowledge in relation to the comprehension of artifice in turn help to set an agenda for design doctoral study and design research; and, equally significantly, allow us also to see the contribution to knowledge per se that design makes.
- i. That it is out of this engagement with, or exemplification of, the central conditions of artifice that we can begin to see the potential contribution to knowledge per se of the study of design at doctoral level.

So fundamental are these last two points that it is worth extending them a little. Even at a first glance it is clear that design may contribute to knowledge, in two ways. First, through the manner in which it articulates the nature of artifice. That is, via the diverse ways in which design can be understood as that “through which” the character of artifice shows itself or presents itself to us for our understanding, then design provides, for our time, the ideal subject-matter, or the “Royal Road” to grasping the nature of artifice and making—particularly in terms of how we understand the shaping of the reciprocal relation between world-making and self-making. Considered as a subject-matter for knowledge, design therefore potentially provides insight into the interface between the artificial world—or the world-made-artificial—and ourselves, particularly in the double respect of the manner in which this relation can or *could* be inflected and nuanced on behalf of subjects and world versus the manner of how it *actually is* so inflected and nuanced in practice.

Second, and this re-iterates a slightly more familiar point, design may potentially contribute to knowledge through putting into play what Archer and others have previously called a “third way” of knowing. Because design cannot be accommodated satisfactorily within either the model of the sciences/technological sciences or within the humanities/social sciences, then design sets up “an-other” model of knowing and doing; instantiates a particular form of praxis or phronesis. The significance of this “third way” of knowing in terms of knowledge is not simply that it lies there, passive, vis-à-vis the existing dominant modes of knowledge. Understood in its full implications, it challenges the absolute nature of the claims of the latter (and especially of science) to set the agenda for what “is” and to elucidate the character of truth for the modern period. This praxis in turn puts into being a new and different way of comprehending the world as a whole—particularly, of course, the artificial world.

This is important. Design is a form of praxis linked to that of the technological (for example) yet distinctly different from it. At the same time, if both the humanities and design are concerned with how self, life-world and meaning are created and known, they are so *differently*—the one essentially narratively, the other artefactually. This difference is profound. The *different* orientations that design takes up to subject matter directly comparable to and in some cases identical with, that of the humanities/technical sciences are what *produces* differences in the modes of knowledge about the world that each produces. These differences are wider, more extensive and of more implication than is usually accepted. For example, to say that science numbers the world and the humanities narrate it is not simply a cliché of knowledge. What it indicates is that both disciplines are primarily concerned with description. That is, they are essentially concerned with what-is (or with what-has-been, which comes to the same thing). Both are essentially retrospective (prediction, in science is merely the obverse of this more fundamental condition). In a profound sense therefore, both, as disciplines if not in terms of the activities they subsume, are essentially historical (and recall here that modern science began as natural *history*). Though, on another level, as symbolic activities, both are actually concerned with world-making (with re-describing the world with the aim of

transforming it in terms of the image of the world each offers) neither explicitly recognizes, or seeks to seriously account for, this fact. Each prefers to stress (if differently) their respectively analytical and evaluative foci on the world already made or the world-given. Indeed both *must* stress this, in order to retain their credibility, as disciplines, in the terms they have originally set up for themselves (that is, as disciplines dealing with an already given and fixed given plane of facts upon which they operate).

The revolution in knowledge that design portends can be sensed when we realize that none of the terms applied above in relation to the humanities or to the sciences applies to design. Design neither narrates nor numbers (though it may utilize either or both they are taken up only as tools, not as essential characteristics) nor, save as design history—which has little to do with design—is design concerned with what has been (save again that reference to the past is sometimes a tool to enable a future to be constructed). The praxiological bent of design, which is orientated *essentially* to possibility, differentiates it both from science—which is orientated to prediction—and from the humanities.

That possibility *belongs* to design in this sense is of the essence. It is the core of how it may potentially challenge the given parameters of knowledge set by the humanities and the sciences. For example, through possibility design contests science's nominal acquiescence to the Real: it sets in play both actions and concepts which transcend the dichotomies that the former depends upon. As Gillian Rose puts it in a neat summary: “recognizing our transformative or productive activity” [and design of course is such a recognition: by definition it is the becoming conscious of transformative action as a shaping activity] “has a special claim as a mode of acknowledging actuality which transcends the dichotomies between theoretical and practical reason, between positing and posited. Transformative activity acknowledges actuality in the act and does not oppose act to not-act.” (Rose, 204)

Rose continues her point by noting that what transformative productive activity understands in this process is that the Real (Actuality) is neither given nor posited but is manifested *through* the act, specifically, “through what it produces.” (Rose, 205). This

means that what design, as a mode of transformative action, allows us to see is how we negotiate the limits of what we understand, at any moment, as the Actual. In design, in other words, we begin to see the processes whereby the limits of the Actual are continually formed and re-formed. And we do so in the context of a mode of acting which, because it privileges neither what “is” nor the pure positing of mind, essentially transcends the dichotomies that so often delimit thinking in other disciplines

At the same time, from the other side, design contests the stress the humanities place on evaluative judgement and the retrospective examination of human possibility. “How self, life-world and meaning are created and known” are *differently* created and known is thought essentially retrospectively (narratively) on the one hand or artefactually (and through propositions) on the other. One way of grasping this difference is through accepting the degree to which design is concerned fundamentally with the (design’s fundamental question is “if this perhaps possible?” or “why not this?). If this is so then design in this respect akin to culture. It was Zygmunt Bauman’s insight some years ago that culture is the

only facet of the human condition and life in which knowledge of the human reality and the human interest in self-perfection and fulfillment merge into one. The cultural is the only knowledge unashamed of its partisanship and ensuing bias. It is the only knowledge, for that matter, which is bold enough to offer the world its meaning instead of gullibly believing (or pretending to believe) that the meaning lies over there, ready-made and complete, waiting to be discovered and learned. Culture is, therefore, the natural enemy of alienation. It constantly questions the self-appointed wisdom, serenity and authority of the Real. (Bauman, 176)

And Bauman goes on to note the cognitive significance, of as he puts it, of “fathoming the vast cognitive space” which the cultural stance opens:

assuming this stance . . . [implies] transcending the range of questions and methodological tools which [the project of positive science] condescends to legitimize . . . the cultural stance refuses to acquiesce in the narrowing attitude of positive science and its claim that only the already-accomplished, sentient, “empirical’ reality attainable in the

way that appropriate the past, may be called in as the standard of valuable knowledge . . . While encompassing the future in its unique quality of irreducibility to the past, the cultural stance admits a multiplicity of realities. The set of universes it explores . . . contain also the possible, the potential, the desirable, the hankered after, even if as yet improbable worlds. (176-177)

He concludes the passage:

This concept of sociology comes very close to the suggestion . . . made [some] years ago by Johann Galtung. . . that one of the sociologists tasks “is not just to uncover mechanisms to account for the empirically existing, and to predict what will happen. It is also to escape from the straitjacket of the empirically existing and narrow range of the predictions— into the total range of the socially possible. That is one assumes that the social order found empirically is only one among at this stage, a cognitive space—of enormous import. It is the space of being able to think about thinking-differently-about-the-present; a space of thinking about the possible in a quite different way than can be offered through the sciences or the humanities. When Bauman speaks about the cultural (tellingly, these quotations come from the end of his book which is significantly titled *Culture as Praxis*), he is evoking precisely the space of design—and showing us in effect that this space transcends the knowledge spaces of the existing disciplines, be they the social or the physical sciences. Above all, what we are incipiently offered here is a cognitive space that is congruent with the artificial: the artificial who’s defining characteristic remember, is that it *could be other*.

The significance of this last point should not be lost. It is increasingly clear that, to date, we, that is modern culture as a whole, have not taken fully on board the implications of artifice. In a certain sense, even though our world is increasingly constituted as an artificial world, artifice and the artificial are still that which we do not know. One reason for this is that, as we have just seen, our presently dominant modes of knowing the world are not formed take cognizance of the “that which could be other.” These disciplines are still not fully comfortable with the idea of world making. What Bauman’s formulation lets us catch a glimpse of, is how to think culture as artifice and therefore through artefacture (using this term now in its

widest possible sense): to think culture propositionally, in terms of world making rather than world-telling.

This implies that, as a mode of knowledge, what design may ultimately contribute towards the development of a more adequate “science”—that is to say a praxis, or *phronesis*—of the artificial. This praxis or phronesis is of considerably more significance than “design” as it is constituted at the moment, when we think the latter only its narrow sense as either as a professional practice or as a putative discipline. Nonetheless, what design (in the way we conventionally understand it) contains (carries in *potentio*, on occasion exemplifies or emblemizes) is this wider sense of the dialogical and praxiological means (operational, transformational, configurational, dispositive and strategic) of negotiating and shaping artifice. To put this another way: we know that design is emblematic. We have not yet discerned, or made evident what, cognitively, it is emblematic of.

### **The problem of design knowledge**

All of this is not irrelevant to the question of the Ph.D. in design. What connects the problem of design knowledge—that is the problem of attempting to ascertain the nature of the modes of knowing (and I use this term in the widest possible sense) with which design is concerned—with the question of the Ph.D. is the argument, which amounts to a premise for this paper, that there can be no resolution of the problem of doctoral education in design (and therefore no adequate estimate of the potentialities contained in developing Ph.D. programmes in the field) until there is a deeper understanding of the contribution that design knowledge can make to knowledge in general.

That there is a problem with doctoral education in design is clear. Were there not, then Ph.Ds in design would not be in their infancy. And Herbert Simon’s signal argument put forward many years ago that, “the proper study of mankind is the science of design, not only as the professional component of a technical education *but as a core discipline for every liberally educated person,*” (Simon, 159: my emphasis) would not sound so

strange to our ears today. Strange, of course, not because of the sentiments that Simon expresses—though these are rare enough—but because, in reading it once again, we are surprised twice over: first, that such a statement should come from someone who, however he thought of himself, was essentially *outside* of design professionally considered; second, that it should appear in the context of a discussion about knowledge and its roles in the university, and that Simon should take seriously design's potential strategic role in relation to the university and the formation of (professional) knowledge.

Given that today, as we only too well aware, “Design . . . currently does not occupy the minds of many disciplines” (Fry, 53) the statement still retains its shock value—the more so if we throw in the even stronger observation that Simon makes earlier in the same chapter, namely that

Everyone designs who devises courses of action aimed at changing existing situations into preferred ones. The intellectual activity that produces material artefacts is no different fundamentally from one that prescribes remedies for a sick patient or the one that devises a new sales plan for a company or a social welfare policy for a state. Design, so construed, is the core of all professional training; it is the principal mark that distinguishes the professions from the sciences. Schools of engineering, as well as schools of architecture, business, education, law and medicine, are all centrally concerned with the process of design.” (129)

To which we can only say: as if! While we would most of us feel that Simon is essentially correct in the logic his arguments—even if, tellingly, few of us would today dare articulate them as strongly as Simon has done here—and in truth of Simon's observations.

How does this bear on Ph.D's in design? It bears because the mis-match between the case made and the facts of the case is clearly *directly related* to the capacity (or in this case, incapacity) of design to construe itself as a field of knowledge. *Both* problems then, of the Ph.D. in design and of the status of design within the university, hinge on the question

of what it is that that (design) knowledge might be.

### **Two questions.**

We are faced then with the question of knowledge. Which now transposes itself into two questions.

What is the nature of the knowledge that is sought to be developed in and through the (design) Ph.D. programme?

and

What is the potential contribution of the particular knowledge won in the (design) Ph.D. programme to knowledge in general?

Now *all* Ph.D. programmes, whatever they're particular are faced at the outset by these two questions. But for design these questions are both inescapable and, it would appear, acutely difficult to answer. They are *inescapable* because no matter how much design may see itself as essentially concerned with what I would call dispositive action (this term including within itself moments of operational, transformational, configurational and strategic action), and no matter the degree to which, particularly at the doctoral level, designers might, quite correctly, want to open up and to put into question the issue of what 'knowledge' might consist of when considered as design, it is nonetheless in terms of knowledge, both in regard of knowledge about design and in relation to the fields of knowledge in general, that any Ph.D. programme (and design can be no exception to this) *must* be organized. Equally, it is on the basis of being able to demonstrate an achieved level of knowledge creation and advancement that such a programme can be evaluated.

They are *difficult* because, unlike similar questions posed in other fields, no clear answer to either question can be given. If, in their formulation they contain, I think, the seeds of their own answering—the idea of *translation* as a core element in the creation of design knowledge for example—still, their unavailability to easy answer poses problems for Ph.D. programmes: for on what basis can the programme be secured unless and until it can answer these questions?

It is not at all surprising, therefore, that in the face of this situation, attempts are always being made by programme educators and administrators (and sometimes by students themselves!) to seek to by-pass or to refuse these questions altogether-or, at best, to attempt to create quick and partial answers to them through the importation of external criteria and standards of knowledge which can then become the key intellectual models in relation to which the programme operates. Often, though not exclusively, drawn from the technological sciences, sometimes from engineering, occasionally from management theory, these models act as a kind of stop-gap; a means of giving at least a temporary methodologically coherent answer to these questions. Providing both what explicit intellectual structure the programme operates with, and permitting the programmes a degree of self-definition, both for themselves, and, crucially, to the university as a whole within which they are situated, such models give a semblance of self-identity and intellectual respectability.

There is a question however about how successful this self-description really is. In particular, while we can recognize the sometimes pragmatic necessity which forces such importing, particularly given the paucity of any tradition of doctoral research in design and therefore the lack of any developed tradition of design-knowing, the price paid for this borrowing is nonetheless great-and is much higher, I think, than is usually acknowledged. Three points will suffice to make the case.

### **The importance of questions**

The first can be easily summarily stated. It concerns questions. Borrowing pre-empt questions and that is a problem. Borrowing supplies an underlying metaphor or model, which provides a reference point for answering, as if by rote, the most fundamental questions. Yet it is fundamental questions, and the keeping alive of basic issues through questioning—and the use of research not to answer or close them down these issues but to keep them in play, to keep them in the forefront of mind, to find ways of re-stating them time ad again so they continue to be *thought*--that is vital to an intellectual

discipline. To see how crucial a point this is; and to understand, in another sense, how, by negating questions, design may crucially short-change itself, (and through this lessen its own impact, frustrates its own ambitions, and (not least) negates the impulses and instincts of those that come to it as both students and professionals) one has to take a double-step backwards.

Writing in 1974, in the TLS, on what he considered as the crisis of art history, T.J. Clark asked his readers to remind themselves of what art history had once been. Referring to Lukacs famous essay of 1922, “Reification and the Consciousness of the Proletariat,” Clark quoted a passage which is highly relevant to this issue and which can serve to remind us what is at stake here.

And yet, as the really important historians of the nineteenth century such as Riegl, Dilthey and Dvorák could not fail to notice, the essence of history lies in the change undergone by those structural forms which are the focal point of man’s interaction with the environment at any given moment and which determine the nature of his inner and outer life. But this only becomes possible (and hence can only be adequately comprehended) when the individuality, the uniqueness of an epoch or historical figure, etc., is grounded in the character of those structural forms, when it is discovered and exhibited in them and through them.

(Lukacs (1971), 153 quoted in Clark, 1974, 561)

The sentence point immediately of course to the significance of what we study. To argue that the “*essence of history* lies in the change undergone by those structural forms which are the focal point of man’s interaction with the environment at any given moment and which determine the nature of his inner and outer life,” is to present a summary case for the centrality of the study of one activity which is crucial in shaping those “structural forms”: Lukacs as therefore the primary historiographer of design! But Clark uses the quote in a slightly different sense. Reminding his professional readers that two out of the three examples of historians cited by Lukács were art historians—“What an age this was, when Riegl and Dvorák where the real historians worrying away at the fundamental questions . . . the conditions of consciousness, the nature of “representation”—he

contrasts the passivity of current art history with its *avoidance* of such questions, with the active, “unresolved, sharpened, often bitter” quality of the debates on these issues that had extended down to Lukacs own time. As he put it:

The roll call of names . . . is not what matters exactly. It is more the sense we have, reading the best art history of this period, of an agreement between protagonists, as to what the important and unavoidable questions are. It is the way in which the most detailed research, the most arcane discoveries, lead back time and time again toward the terrain of disagreement about the whole nature of artistic production . . . (about the) conditions of artistic creation . . . (and the questions of) the artists resources and his materials.

Are, note not were. And the implication is equally direct: that the vigor and essential character of the questions practitioners ask of their material distinguishes not just the caliber of the debate but the adequacy of the discipline itself. By “adequacy” (a term which Clark does not use but which seems implicit throughout his article) is meant the way in which a discipline or a field measures up to the key issues that characterize its activity, its practice, the manner in which it comprehends the real possibilities open to it and the multiplicity of circumstances (contexts) to which it refers or which are related to it.

### **Design in its own field**

If what “measures up” are precisely questions, if it is through *questions* that a discipline discovers who and what it is, and which multiplicity of circumstances and contexts are related to it, then in the end questions cannot be avoided-or can so only at the risk of sclerosis of the discipline or of creating a discipline or field as that which does not know or fails to know. There are arguments of course to say that, in many if not most of its manifestations, design is such a field. A field which, in a sense refuses to know; that is, refuses to know what it is itself is, what are its consequences, implications, responsibilities. Certainly, if one looks at design from the point of view of ecology for example one may well come to this conclusion.

It is important to at least consider carefully this argument, because one way that a field does not know itself is when it answers too easily or too quickly the fundamental questions which constitute it. How this often occurs in design, and this is the second of my points regarding the problems of “borrowing” other disciplines to secure the basis of design knowledge, is through attempts to secure design analogously to other, more seemingly powerful disciplines. Take the attempt to secure design through the technological analogy, perhaps the most common metaphor through which design is seen, particularly at the level of design methodologies. The problem with this analogy is just that: that it is analogous, metaphoric, and not actual. To put it another way, although the metaphor may continue sufficient germ of truth to make it vaguely plausible that design is indeed “like” technology (the linkages are obvious), used as metaphor it negates the difference. Yet it is the *difference*, of design vis-à-vis technology, that is of the essence. What distinguishes design is not that it is like technology, but that, sharing certain conditions, it is clearly different from it. As we have seen already what is of interest in design not only practically but also intellectually, in terms of the knowledge offered, is what distinguishes design from technology: and how therefore design offers a related, but different, mode of knowing to that given through technical experience alone.

An example shows this. Whatever the origins of technology in the practical manipulation of things to produce specific effects and consequences, the intellectual colonization of technology by science (the reverse side to the economic colonization of science by the technological imperative) has had profound consequences on the way we view (or fail to view things). Technology today means the application of the natural sciences to the analytical comprehension of artefacts treated projectively as if they were natural phenomena. From such application are derived performative and even design criteria—understood as parameters, constraints or as performative or technical possibilities. However, it is clear that such an analytic does not yield comprehension of artefacture per se. What it yields comprehension of is the degree to which, as existents, technological things can be seen as akin natural things (can even be said to behave, to have effects, as-if they were natural things) and can therefore be said to be analyzable in terms of natural

laws, parameters and constraints (which can then be said to determine the configuration of the thing). From the perspective of science, all things (including natural things) *may* be so analyzed. The problem is that such analysis proffers only an acutely limited comprehension of configuration. As Simon has pointed out, the application of natural science to artefact *reduces* the “thin interface” of the artifact (as Science sees it) almost to naught. Crushed as it is between the “logic of the natural laws operating within and without,” (“Given an airplane or given a bird, we can analyze them by the methods of natural science without any particular attention to purpose or adaptation . . . after all their behavior is governed by natural laws just as fully as the behavior of the anything else (or at least we all believe this about the airplane, and most of us believe it about the bird)” the artefact is easily reduced to a boundary condition “about which little or nothing can be said.” (Simon, 7).

What is lost, in this view, is everything that is of occasion from the perspective of design. Design begins and ends with configuration and with the sense that that what matters, in artifice, is precisely the “boundary condition” i.e. the quality of the interface between the (internally) configured artifact, its users (using this in its widest sense), the (multi-valence) of it’s ends and the environment (worlds) which it constitutes and within which it lives and has effects. Simon, of course, understood this, i.e. understood that it is precisely in the realm of interface--in the internal relations, and reciprocal workings, of the artifact as it mediates inner and outer environments through the configuration of its form--that the core of artifice and of design lies: “The artificial world is centred precisely on this interface between inner and outer environments: it is concerned with attaining goals by adapting the former to the latter. *The proper study of those who are concerned with the artificial is the way in which that adaptation of means to ends is brought about--and central to that is the process of design itself.*” (Simon, 132).

What must still be emphasized however are the cognitive implications of all this. Even in Simon, a latent belief in the relation between reason as such and technological reason, causes the full-depth of this last point to be somewhat lost. Much design theorizing, especially that which is construed under the domination of technology, still operates with

the implicit assumption that the essential relation between artefacts and natural laws still holds, not only operatively but in the sense that this relation takes axiomatic cognitive precedence—to the exclusion of (say) interface and configuration or the artful disposition of things to have (complex) effects and to effect complex consequences. It is these configurative aspects of the artefact in the true sense—what I would call its internal relations—that are denied as without reason itself, or at least as possessing no true cognitive independence, no true basis of knowledge. Hence we pass to technology or the attempt to cast design as “like” technology.

Clearly, I think that this view is today unsustainable. Indeed, I would say that it is the *absolute* unsustainability of the view of what I will call “artefact denial” that marks the potential coming-of-age of the thinking-of-design, one symptom of which is the rise in the number of Ph.D. programmes in design around the world. It may even be that it is only with the relative demise of the “technological” view that Ph.D. programmes in design (in the full sense of the concept) are even possible. This is an argument that says that not only is the maturity of design thinking in direct relation to increased apprehension of design as a potential mode of knowledge, but this apprehension in turn based on an ultimate confidence that the designed artefact (using this term again in its widest possible sense) and its configuration (and all that is implied by it) are sufficient and necessary subject-matters from which to develop knowledge—and therefore one need not, in effect, dissolve the artefact to reach the underlying determine law as the technological sciences must. Rather, we are beginning to understand, it is precisely *through* the artefact (and what determines it, and what its consequences and effects are) that we find design knowledge.

Obviously then, as far as I am concerned, design cannot be thought as simply a sub-set of technology and it is a category mistake to think that one could (just as much as it would be to align design wholly to the humanities or to the social, psychological or managerial sciences or of any other single field one wishes to analogize it to, however much any, or all, approaches may be drawn upon in research). As Charles Owen has recently reminded us,

Design is not science, and it is not art-or any other discipline. It has its own purposes, values, measures and procedures. These become evident through comparisons, but they have not been extensively investigated, formalized, codified or even thought must about in the literature created for the field. In short there is little to point to as a theoretical knowledge base for design. As a result those who seek to work more rigorously look to scientific and scholarly models for guidance, and we find reference to “design science” and examples of “design research” that would seem to fit more appropriately in other fields. Yet it is reasonable to think that there are areas of knowledge and ways of proceeding that are very special to design and it seems sensible that there should be ways of building knowledge that are especially suited to the way design is studied and practiced. (Owen, 10)

The problem is, of course, how to construct that knowledge.

One way that we *cannot* construct this knowledge is through negating the questions that underpin this challenge. Negating questions pushes us away from comprehending design in the ways that Owen indicates. But another way of not attending to Owens’s ambition is to create knowledge *about* design that is not yet knowledge *of* design or designerly-knowledge.

### **The limitations of knowledge-about-design**

We are beginning to see that the problem with metaphoric identifications—of this field (design) as. In some manner, “like that,” are at least two-fold. Or, to put this in another way, that the use of other models of knowledge to determine and ascertain knowledge about design is a double-edged sword. Clearly, on the one hand, metaphorization permits a *degree* of knowledge to be developed. Since design is some ways co-terminus with technology there are moments of design that can be elucidates through this analogy or through utilizing the more developed language of the technical sciences to access and articulate the technological in design. On the other hand, there remains a question about whether, in the end, it is design-knowledge that is so developed.

The point is important. One way of understanding the problems involved in meeting Owen's ambitions, is to realize, as has often been acknowledged, that in speaking about knowledge in relation design we are speaking about (at least) two things. There is knowledge *about* design. And there is *design-knowledge*. The former is, broadly, knowledge which results from research into the conditions under which design operates or which results from research into the *results of* design action. The latter can be defined, in a preliminary manner, as knowledge directly concerned with, or elucidated from, the knowing involved in the processes, means and ends of design (dispositional) action. Now, if, in practice, it may be impossible to draw the boundary lines between these modes, their differentiation is theoretically significant in that it is essential to identify this second mode of knowing since it is here that the particular distinctiveness of design-knowledge lies.

How essential this is becomes evident when we realize that design knowledge in the first mode knowledge-about-design can be fairly straightforwardly understood *within* existing models of knowledge. Knowledge-about-design corresponds, as we have said, to research on all that surrounds the design activity and to all the knowledge about that activity which, so to speak, measures it from without (scientifically, technologically, sociologically, even, why not? psychologically or psychoanalytically). We can agree that this knowledge provides essential understanding in contextual terms about how it is that design operates. Let us say that through the use of critical perspectives and intellectual tools drawn from other disciplines and fields valuable insights may be drawn which should (in theory) potentially expand considerably knowledge about design.

But the limitations of this mode of knowing design are also described in this statement. Precisely because such knowledge is analogized and is sought from without it casts very little light on what is *designedly* about design action. In a profound sense this is knowledge which leaves everything the same. In using intellectual tools from other disciplines, and therefore in constituting design objects of knowledge in terms of the objects of these disciplines, design is inevitably read within these limits. Technological

understandings of design thus reflect technological priorities just as sociological understandings present design as a form of embodied sociology. This means however, that since the objects construed by knowledge-about-design are not identical to design objects per se, then design itself is inevitably mis-, or at best inadequately, represented. A number of points now arise.

- First, it is from here that there arises the familiar call that knowledge in general does not grasp what is essential in design. This call is essentially correct. And resistance to the inevitably, colonizing knowledge involved in the transcription of analogous models onto design has validity in that, under these rubrics, design will appear merely as a sub-section of another master discipline.

- Second, whatever knowledge is gained in this exercise—and it might not, in principle, be negligible—though in practice there seems often little to see, something of the case, as Walker Evans once memorably said of a student’s photograph, “that there is less here than meets the eye,”—what is clear is that, in such application, all that is particular to design (everything that is inadequately represented by the omnibus term “designedly”) all but disappears *as knowledge*. That is, the designedly may be spoken about, or spoken around, but it is not fundamentally addressed, not interrogated, not explored, not opened up, not made the subject of speech, of discourse. This is significant, since as number of authors have pointed out, if something cannot become a matter of speech then it tends to disappear as such, i.e. it does not enter discourse as such and therefore remains invisible. Hence, of course, one of design’s ironic conditions: that is everywhere seen and yet everywhere remains invisible.

- Third, and of crucial point, in the relation between design and its metaphoric other there is no equality. By this I mean that analogical knowing extracts a severe price. The relation that obtains between the master-discipline that is set up as the means that allows one to know design, and design itself, is one of subalternity. Intellectually, what is key here is not only that design is subsumed under the master-discipline—though this is itself important. Of equal point, in terms of being able to construe design as a field and practice

of knowing is that in such applications the confrontation with design does not react back onto the master discipline. Technological knowing for example is rarely challenged in its encounter with design nor is sociology transformed in its encounter with configured artifice. (Nor, in another example, has history yet permitted itself to be re-written in the light of the influence of design history). In short, what is not allowed in this process is that design should be thought to possess its own mode of knowledge and thus to contain a capacity capable of reacting back onto, or influencing, or challenging, knowledge itself. We can call the knowledge that is produced in this context non-reactive knowing. Or, to put it more bluntly, *knowledge without power*.

- Finally, to see design through the metaphor of another mode of knowledge not only effectively prevents the knowledge that is gained (and which potentially lies within design) from reacting back onto knowledge in general, it also fundamentally blocks the realization of design knowledge. To the extent that knowledge revealed through these means can be presented *as* design knowledge (or as the source of knowledge *for* design, i.e., to see the metaphor as that which essentially supplies knowledge *to* design) so it will block the formation of design-knowledge itself. The importation of other models of knowledge to stand as the criteria and reference points for knowledge in design therefore not only reinforces the idea that there is no distinct design knowledge as such, but at the same time re-emphasizes design's subaltern status within the university. Looked at in this way, as lacking its own arena of knowledge, design appears only as an inferior subset of a more substantial (and more prestigious) fields. The question then arises: why study design if there is nothing in it (i.e. no distinct knowledge that it possesses) and no particular contribution to knowledge in general which design can make? As we know, the answer to this last question is very clear. Historically at least, design, by and large, has not been studied. We come back to Tony Fry's lapidary understatement "Design . . . currently does not occupy the mind of many disciplines."

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The onset of new doctoral programmes in design does not of itself solve this problem. It

is not only that such programmes have to struggle with the (historic) failure of the field to create an informed intellectual tradition about design, but there remains a lacuna at the heart of the enterprise, that is to say the lack of a model of what design knowledge consists of in its distinctiveness and the lack of a comprehension as to what this may mean for knowledge in general. Without such a model design is both vulnerable as an intellectual activity, as well as, it should be remembered, increasingly incapacitated as a practice.

To take up the first of these points.

We know that one reason for design's marginal position with respect to the University as a whole is due, in part, as we noted earlier to the failure of design practitioners "to build an informed intellectual tradition of substance" (Fry, 53) concerning design. This (a failure in turn contributes directly to failure of the sciences and humanities as a whole to recognize just how important it is to engage with design, and also emphasizes—indeed over-emphasizes— the difficulty, complexity and obtuseness of the questions asked of this material. But that such questions appear "impossible" is also to be linked to the almost complete refusal, at the university-level to think about design in a serious way and, what comes to the same thing, to grant design the status of knowledge. Whatever cause might be assigned to this situation—and to the list already accumulated must be the astonishingly low status that artifice in general has a subject of study within the university—it is clear that this failure by the profession and the universities not only has the wider consequence of helping to produce a serious lacuna in knowledge concerning almost everything that has to do with the character of human action and intervention in shaping and giving particular characterization to the made world, but also reacts back reacts back on the comprehension and self-comprehension of design as a field of study or mode of knowledge.

As we have seen, from the position of the literal incomprehension of what is at stake here, it becomes all too easy (even from within design itself) to place design at the margins of thought and therefore to dismiss it as of cognitive seriousness. All of this of

course creates the conditions for the difficulty in design claiming *any* place, let alone a place at the center, of the university. At the same time it renders the key questions with which we began (which effectively focus on puzzle of “In what sense precisely can design as a mode of action, an intrinsic human activity, a value, an embodiment or a process be considered “knowledge”?) at once (for in what sense precisely can a mode of action, an intrinsic human activity, a value, an embodiment or a process be considered knowledge when they are already declared as effectively lacking knowledge?) and impossible to answer (lacking, as they do, an adequate context for the exploration of these issues or even for their formulation as serious intellectual issues).

But not only this, and not only in the university. Less directly realized, but increasingly, I think, *felt* today, is that the lack of a model of what design knowledge consists of in its distinctiveness, and the lack of a comprehension as to what this may mean for knowledge in general, has considerable (if diffuse) implications for practice. Take for example the issue of design methods. In an interesting auto-critique of his earlier position, J.C. Jones complained some time ago that, whereas design methods were intended as

the means by which professional practices in design and other fields could be . . . made more sensitive to human needs the new methods have become convenient tools for larger and more rigid planning and have also become the means of making design into a barren academic subject removed from . . . the lives of those for whose benefit its supposed to exist (Jones, 31)

Now one thing that “went wrong” with design methods as they were formulated in the 60s and 70s was that, under the technological model, the problem of the “very high sensitivity of human action to technology and the very low sensitivity of technology to human life” (Jones, DD) was itself transposed into the structure of most available design methods—if not, indeed, into the very notion of “method” itself. The result was that the design methods construed within this period generally fail, not just as methods in the technical sense (though they usually do, at least if taken as equivalent to a complete encompassing of the design problem referred to), but more profoundly in terms of what Jones would now define as their minimally permitted normative ambition, namely that

such methods should be able to contribute to design understood as “*a way of improving relations between objects and people.*” (Jones, 31)

That failure is not (just) a failure of application. It is not even a failure of “methods” per se. (For Jones is surely right when he insists that “to imagine that that it is possible to change the pattern of industrial life, without, among other things, a collective language to replace and make public the up-to-now private and largely unvoiced thinking of professional designers and planners is surely naive too” (Jones 32)). Behind these failures lies a deeper theoretical lack, a lack, for example, of an adequate model of the relations between persons and things and of how design could potentially, and in actuality does, intervene into that relationship. This is a lack, in other words, of the capacity to model adequately the two-way or three-way relationship between technologies, things and persons. That the latter is not the normal pattern of events is not only a practical issue concerning the domination of economically-impelled technologies over social relations, *it is also a consequence of the inability to adequately theoretically model the reverse relation implied here.*

This is one instance of a very complex issue. But what is already clear is that both in practice and in the university therefore the incapacity to model design renders design vulnerable on several levels. Perhaps most ironically, the same failure results in skepticism, even within design, that design practice can be a subject of research. It certainly results in a skepticism that design practice is in itself or could be in itself considered as a research-equivalent activity. This is important because while at some levels this skepticism is a necessary balance to the alternate un-thought claim that practice is somehow of-itself “naturally” research we might wonder about some of the presuppositions that guide this caution. In the recent literature Cross gives the case most thoroughly (though see also Archer, 1995, 10).

I do draw a distinction between works of practice and works of research. In a previous editorial I have stressed that “I do not see how normal works of practice can be regarded as works of research. The whole point of doing research is to extract reliable knowledge

from either the natural or artificial world and to make that knowledge available to others in re-usable form.” This does not mean that works of design practice must be wholly excluded from design Ph.D.’s but it does mean that there must be reflection by the practitioner on the work, and the communication of some re-usable results from that reflection. (Cross, 2)

Bruce Archer, using a slightly different formulation and subsuming research-by-design into action research, is slightly more forthcoming: -

It is when research activity is carried out through the medium of practitioner activity that the case becomes interesting. There are circumstances where the best or only way to shed light on a proposition, a principle, a material, a process or a function is to attempt to construct something, or to enact something, calculated to explore, embody or test it. [In these circumstances, Action research] produces insights which might never otherwise be obtained. For a century or more they have provided case account material that has been extremely fruitful in the advancement of, for example, medical practice, agriculture, environmental studies and law. (Archer, 1995, 11, 12)

though he warns “Action Research can hardly ever be objective, in the strict sense of the word. Moreover, he adds, Action Research is almost always “situation-specific.” “The term “situation-specific” reminds us that . . . its findings only reliably apply to the place, time, persons and circumstances in which that action took place.” (Archer, 1995, 11-12)

Both formulations are interesting. Both imply, in different ways, difficulties with practice as research, both prescribe some requirements for practice to be considered as research. Yet both statements seem to miss a wider point. It is not simply that design practice is “inadequate” as research. Clearly design practice per se is not research since it practice is not orientated, in the first instance, to knowledge. But this does not mean that practice cannot become knowledge. The point is however that in order for practice to become knowledge-productive then the one-step process of design enactment or practice needs to

be converted into a two-step process: that is, enactment (or practice), *plus*, as a second stage, critical reflection on, and *analytical translation* of, enacted practice into knowledge.

This concept of knowledge translation is key. Not only is it translation of enacted configuration into knowledge which meets Cross' minimal criteria for research—i.e, “need for reflection” and “communicable or re-usable results,”— and, significantly, *pace* Archer, also enables conversion of the situated limits of Action or Options Research into higher-level, less-situated Fundamental, Strategic or Applied knowledge—but it is translation that creates knowledge, and incipiently at least, creates design knowledge, that is to say knowledge which is derived from or draws from what is specific and particular to designing.

Of course, what is necessitated for translation is a higher order model of design-knowing. Lack of this prevents effective translation. For in what terms is one to translate enactment into? It is also immediately clear that, if we are to possess means of translation, then these must be congruent with the nature of the enactment to be translated. This is of course the same problem we have pursued through the paper. We have already seen that the problems facing the Ph.D. in design are identical to some key problems of design practice and are now in turn identical to the problem of how we can utilize practice as a moment in research. Both require high-level models of what it is that design is, thought through in terms congruent with design-action and designed-artefacts. The question is, from where is this knowledge to arise? And what form of knowledge might we be speaking about here?

One factor we are dealing with here is explanation. In considering the (translated) conversion of the limited efficacy of Action Research into, say Strategic Research, we are moving up the explanatory ladder. The higher order modes of research encompass higher orders of explanation. It is therefore easy, as with the earlier analogies we discussed, to see such a move as a move towards Science. After all, Science (Archer again) is concerned precisely with explanation:

What can be observed? What events can be recorded? How does this, that or the other event proceed? What is the cause of this or that? The scientific ideal, not always achieved, is to produce explanations of enduring validity. Most particularly, the scientific ideal is to produce explanations that remain valid when tested in wider and wider fields of application, and which therefore offer some powers of prediction.  
(Archer, 1995, 7).

The problem however, of using Science as a prospective model is that in slipping back to utilizing a “higher order” model we are repeating again the problems of metaphorization, —and doing so with a model not at all consonant with design knowledge or practice. How do we get out of this problem?

A possible way of doing so, one which takes us directly to being able to answer the questions we began with, is to pursue the use of Scientific analogy using it, in reversal as it were, in order to re-construe how we might think design differently. In other words might it be that by directly confronting the lack of fit between design and science that we can begin to articulate the basis of knowledge on which Ph.Ds in design might be constructed?

Now in thinking of the unsuitability of science as the model for design knowing it is not just that, as Archer has it at one point, “mathematical or logical models, however correctly they may describe the flexibility, interactiveness and value-laden structure of the design process, are themselves the product of an alien mode of reasoning.” (Archer, 1979, 17). While this is certainly one moment—since it is precisely the mode of reasoning involved in design that is of the utmost issue to design as a field of knowledge—the problems with the analogy go much deeper.

We can look at these issues under three headings.

## **Procedure**

It is now a commonplace that the distinctive feature of science is not simply the subject matter of science, but the procedure of inquiry that science brings to bear upon it. “A scientist may study any phenomenon he chooses: but the kind of understanding he may achieve will be limited by the observations he can make, the measures he can apply, the theory available to him and the testability of his findings.” (Archer, 1979, 19).

There are two points here. First, the emphasis in science on procedure is absolute. Heidegger gives the sharpest and most concise formulation that I know:

What does the essence of research consist of? In the fact that knowing establishes itself as procedure within some realm of what is, in nature or in history. This is accomplished through the projection within some realm of what is-in nature, for example-of a fixed ground plan of natural events. The projection sketches out in advance the manner in which the knowing procedure must bind itself and adhere to the sphere opened up. This binding adherence is the rigor of research. Through the projecting of the ground plan and the prescribing of rigor, procedure makes secure for itself its sphere of objects within the realm of Being. (Heidegger, 118)

Second, is the complex issue of subject-matter and the relation between subject-matter and method. Again we can use Heidegger. A few pages further along in the same essay, Heidegger adds to his statement on procedure a formulation on this relation. What takes place in the establishing of the sciences, says Heidegger, is “nothing less than the making secure of the presence of methodology over whatever is (nature and history)”. And he adds: it is this, i.e., methodology, “which at any given time becomes objective in research.” (Heidegger, 125).

Now, if we take these two statements together they provide a powerful [if necessarily over-simplified] snapshot of science as we encounter it today. How does this fit to design? Of course there are analogies between design and science in respect of concern for and with method. Interest in process and method has come, in some circles, to *be* design. Method and procedure in a sense, fascinate all designers. Teaching in design is, arguably, nothing other, ultimately, than teaching about method.

Yet on another level this emphasis on procedure *over* subject-matter, is wholly antithetical to design. Precisely what is of occasion in design is the quality of the substantive configured actuality of the thing-itself. In the same way, what is at question in *understanding* design is understanding the nature of the “subject-matter” that design in all of it’s complexity “is.” In these contexts domination of procedure *over* object and the essential *reduction* of the object involved in the scientific procedure is wholly antithetical to design.

There are three important reasons for this anti-thesis.

First, a point we have touched on before and will come back to again, is the stress, in design, on the artefact. This stress may be bemoaned, sometimes rightly, as providing for the fetishistic “distraction” that on occasion so blinds design to its own consequences and implications, All of this is true. But itself both a symptom of the dichotomies we began with, and in this context anyway not significant since what the base fact records is simply the manner in which, at whatever level we think it, the artefact (broadly considered) is the place from where design begins.

Second, what matters in design is not, essentially, that which can be measured (however useful this on occasion might be) or that which, through procedure, can be known (though this too may have it’s place in design research) but rather the grasping of the nature of the (series of) complex configurative acts that secured the phenomenon as such. In Science configurative acts are secured through determining laws acting interactively, in response to given environments to “result” in specific forms. In design there are no laws, factors are not absolute, requirements are rarely, if ever, wholly objective, the environment is not necessarily given and the mode of interaction of conditioning factors is not causal and deterministic but essential open, certainly context-bound and very often subjective to a high-degree. Thus, whereas in science (determining) law (as procedure) can take precedence in design this is not possible. Procedure is not law in design. Both law and procedure are therefore weakened immeasurably in design. Neither can operate

with authority—but only conditionally, as tools.

Third, in that sense the essence of design knowing cannot be research (in the scientific sense) at all. Far from being able to establish itself as a “procedure [of knowing] within some realm of whatever is” design is a configurative and dispositional procedure which operates in the realm of what is not—or better, which operates between the realm’s of what is and what is not-yet and may never be). In Science, both method and procedure are grounded and ultimately secured, as such, by that on which they depend, namely the projection of a fixed ground plan of events (nature). In design neither a fixed realm of whatever is nor a fixed realm of natural events can be posited. On the contrary, as noted earlier, the distinguishing feature of artifice or of artificial things is that they could be other. Artifice is therefore endemically contingent. What has to be posited as the realm of design is therefore possibility.

Merely to make these last statements at once reveals the comparative potential interest for knowledge, of design. Clearly, if there is no fixed ground plan of events underlying artifice then, at least in terms of how we understand science, i.e., as modern science, no science of design is, as such, possible. This was Simon’s point when he noted that

the contingency of artificial phenomenon has always created doubts as to whether they fall properly within the compass of science. Sometimes these doubts are directed at the teleological character of artificial systems and the consequent difficulty of disentangling prescription from description. This seems to me not to be the real difficulty. *The genuine problem is to show how empirical propositions can be made at all about systems that, given different circumstances, might be quite other than they are.* (Simon, x) (My emphasis)

In other words, artifice is by nature uncertain, or, if this word is disliked, *propositional*. This means that all artefacts are provisional, even those which survive the ruthless editing of history. If one is to seek an endurance in design it therefore has to be found in that which can endure *through* the provisional, the propositional and uncertainty. What endures in this way cannot be understood through the notion of a “fixed ground plan of

events” (since no such plane can be constructed for design). It can at best be grasped only as *capacity*, i.e. the capacity for *configuration*, to dispose things to have. But this removes the “nature” of design from nature: it internalizes it and makes it in many ways the subject of an anthropology or even an ethics.

## **No Experiment**

This last point is emphasized as we consider in more detail the final sentence of the quotation from Simon that I just gave you, i.e. “The genuine problem [for knowledge] is to show how empirical propositions can be made at all about systems that, given different circumstances, might be quite other than they are.” If we connect this to a similar point made by Roy Bhaskar in some recent texts on method, we can see the further difficulty that Science may have with design (and vice versa). In a discussion of method in relation to open systems (and design is, by definition, an open system) Bhaskar notes that, “epistemologically, the openness of . . . systems [entails] the complete absence of universal empirical generalizations of any cognitive import. This leaves [the study of such systems] without the possibility of crucial experiments to investigate the necessary transfactuality of its subject matter.” (Bhaskar, 1994, 93).

This tells us that, for design, in effect, experiment is impossible. This is significant on two grounds. First, because we know that the experiment is crucial to modern science. Second, because this “deprivation” of experimental knowledge forces a change in how we have to conceive of what gaining knowledge, in terms of design might mean. To understand the depth of this last point we need to look a little further into the logic of experimentation. Heidegger summarizes this logic in the following ways: -

“in the physical sciences investigation takes place by experiment. But physical science does not first become research through experiment; rather, on the contrary, experiment first becomes possible where and only where the knowledge of nature has been transformed into research. Experiment begins with laying down law as a basis. To set up an experiment means to represent or conceive the conditions under which a specific series of motions can be made susceptible of being followed in its necessary progression,

i.e., of being controlled in advance by calculation. But the establishing of a law is accomplished with reference to the ground plan of the object-sphere. That ground plan furnishes a criterion and constrains the anticipatory representing of the conditions. Experiment is that methodology which, in its planning and execution, is supported and guided on the basis of the fundamental law laid down, in order to adduce the facts that either verify and confirm the law or deny it confirmation. (Heidegger, 121-2)

As one reads the unfolding of this logic it becomes clear that, unless, understanding the strict limits involved, (and with full awareness of the artifice of the act), one construes special, closed, situations in which experimentation can be performed (against the grain of the activity as it were: and where they will probably not, in fact, measure design at all, though they may well help to *create* designs) then experiment (and science) are both outside design, for except within special limits, design is neither closed, nor coherent nor consistent, the three conditions necessary for the law of the testable confirmation of rule that is fundamental to experimentation to come into play.

Lack of experiment does not, of course, confine design knowledge to incoherence. But what then replaces experiment (and prediction?). The quick answer to the first term is that propositions replace experiment. The quick answer to the second is that explanation replaces prediction. Put simply then, propositions are to design what experiment is to Science. What design offers is the capacity to create propositions about things (“this could be that”). To put this better, if experiment is in reference to rule (“if this, then that”); design is in reference to possibility (“could this be?”). Notice that this possibility is *not* (at least in the first instance) a possibility of knowing, as would be scientific possibility. In scientific possibility the reference “could this be?” would be to a hypothetical law: i.e. to a law, or series of laws, explaining or accounting, in causal terms, for the observed configuration or behavior of a thing. In design, by contrast, the reference is to enactment: i.e., “could this [potential thing] be . . . successful in its enactment in terms of desired ends and in relation to the likely environment/s it will encounter.” What is referred to in design possibility is therefore a real thing. Or, more exactly, the reference is to the enactive translation and transformation of a fictive proposition (“this?”) from the status of proposition (design) to realization actualization

(“this!”).

The question then arises, how can we know such phenomena? The answer is that what we can know of such phenomena is their causation, but in a different sense to a scientific knowing of cause. In natural forms things are constituted through the operation of causal laws in negotiation with one another in the context of determinate but evolving environments. Artificial forms by contrast are constituted through the negotiation of complex requirements, operating in ill-determined, incomplete and open environments where both requirements, world, factors pertaining and environment are subject to contingent possibility, let alone the whims of subjective action. It follows that no determinate law can be evolved for such phenomena. All that such phenomena can reveal, to subsequent analysis (and this incompletely) is, first, characterization of some of the likely casual factors pre-dominating as key considerations in the designer’s mind as objective circumstances bearing (but never with complete finality) on the outcome of the exercise, and, second, through retrospective analysis of what the configuration achieves in terms of the relation between configuration, elements and ends, some sense explanatory sense as to how this entity came into being, how it functions, what its consequences and implications are (what it’s force is). This is not negligible. Nor is it without intellectual respectability. Bhaskar would call such explanations “realist”, meaning by this term that they arise from

“A transcendental refutation of the empiricist ontology hitherto informing dominant accounts of science, and its replacement by a more complex ontology, on which the world appears as structured, differentiated and changing. From the standpoint of the philosophy of social science, the most important point to note here is that the absence of closed systems (and the impossibility of crucial experiments) means that criteria for rational assessment of theories cannot be predictive and so must be exclusively explanatory.” (Bhaskar, 1990, 147)

Such are depth explanations for example, whose point is to *enable better further transformation*. This is explanation then orientated to further or future action. It is hermeneutic in structure since it deals with interpretation not calculation (even though

calculation may be involved). What we are seeking to construct here is a hermeneutic of explanatory action, particularly as it seeks actors striving to negotiate relations between humans and artifice.

This last point is important. What designs establish are propositions concerning relations. What are brought together in design are incommensurable worlds. Design negotiates how the incommensurable can be negotiated.

A number of issues are opened up here once we establish this point. First, there is the condition of relationality or the emphasis on relations (rather than on that, which, in its singularity is brought to stand, and only retrospectively re-fitted into the relational context in which it occurs). Second, the condition of subject-object relation. The key relational nexus that design explores is after all that between persons and things (however “things” may be defined in any instance). This is important in this context because this is that which Science is weakest at determining indeed in a certain sense cannot determine, since modern science is grounded on the subject-object split and all attempts at scientific comprehension of how persons and things interact must pass through this filter. [cf. Heidegger, p.133/150]. Third, and more familiar, it is clear that the propositions that design construes and presents for our consideration are essentially aspiration. This is well known. Simon uses this point to differentiate Science and Design: “The natural sciences are concerned with how things are. . . . Design, on the other hand, is concerned with how things ought to be, with devising artefacts to attain goals.” (Simon, 132-133)).

In other words ends are internal to design-and this connects to Archer’s “aspirational” formulation of design, where he sees it as both an aspect of material culture, and an embodiment of what he calls the “third way”: “Any subjects which relate with man’s material culture must necessarily be anthropocentric. A discipline which claims, as some kinds of Science do, to deal with matters that would remain true whether man existed or not, would be ruled out from our third area. [Conversely] any discipline falling into this area must therefore be aspirational in character” (Archer, 1979, 19). We can bring this last point together with the first two by saying that goals and “oughts” are moments of securing, provisionally, and propositionally, under conditions of uncertainty, possibility.

The possibilities so proposed are relational. The cover primarily, but not exclusively, the negotiation of relations between persons and things (thought on all levels in which this is accomplished from the individual through to the species-level). What distinguishes these relations is that they are the exploration of the possible forms that these relations might take in relation to the sphere of artefacture. This suggests, taken to a further degree of abstraction, that possibility is to design what determination (and the law) is to science. If this is so then design therefore becomes the subject-matter for the science of the possible (And Alfred Jarry's marvelous turn-of-the-century invention "Pataphysics," or the science of imaginary solutions, may then find its eventual realization in an extended understanding of our grasping of the possible).

### **Obloquy for the artefact in the view of Science**

The last major conditions we need to look at are those surrounding the comparative relation of science and design to artifice and artefacture. We have made reference to this previously so comparatively little needs to be said here. What is explored, as a proposition in design is a condition of the artefact, or a condition of artefacture (widely thought). This is highly problematic, for Science. It is not just that the artificial is surrounded, as Simon puts it, by a pejorative air:

My dictionary defines artificial as "produced by art ral unnatural. As antonyms, it lists: actual, genuine, honest, natural, real, truthful, unaffected."

(And Simon comments dryly in respect of this listing: "our language seems to reflect man's deep distrust of his own products.") (Simon, 6). The important point in this situation is this obloquy for the artificial translates into the positioning of the artificial and the artefact as that which is understood, scientifically speaking, as *outside* of thought. We have said that design can be thought as a phenomena through which what "is," in terms of artifice, most profoundly shows itself. The problem is that, from the perspective of Science, this notion of an artefactual "showing" of an artefactual 'essence' appears almost as a contradiction in terms (as indeed, *in a certain sense*, it is). The sciences,

including the technical sciences, take their veracity and force from the fact that they construct themselves as the means by which what “is,” i.e., what *naturally* is presents itself to us. The distinction real: artificial is the distinction of that which has essence, or and therefore “is—the real—from that which is without essence, which lacks a core of the real, of the Actual and which therefore cannot be identified with an “is.”

Artifice, of course, in this dichotomy, represents all that is *without* essential identity. For this reason artifice appears to lie outside of truth: first, because no reflection can be accomplished in relation to it which closes on an essence, and second, because no decision can take place in relation to it concerning the essence of truth that it might deploy. But if artifice is placed outside of truth it is consequently placed outside of thought. Broadly, as we know, this is the situation today. What is artificial is thought comprehensively only in so far as it is capable of being rendered into the quasi-natural. What cannot be so rendered escapes science and so escapes thought.

But if the artificial cannot be thought neither can the artefact. But, to repeat, if this is so then everything that is of occasion from the perspective of design is thereby lost. It is in reciprocal workings, of the artefact as it mediates inner and outer environments through the configuration of its form, that the core of artifice and therefore of design lies: “The artificial world is centred precisely on this interface between inner and outer environments: it is concerned with attaining goals by adapting the former to the latter. The proper study of those who are concerned with the artificial is the way in which that adaptation of means to ends is brought about--and central to that is the process of design itself.” (Simon, 132). A simple conclusion follows. If we take it therefore that configuration and artefacture/the artificial are central to design—for what is design but a notion about the felt and real significance of configuration in artifice? —Then it is clear that all such models of knowledge which do not place artefacture/artifice/configuration at the center of their intellectual operations will be inadequate, if not dangerous, for design to take up. To negate interface and the manner in which it is brought about and realized through configuration is to negate what it is that design might be.

Where have we know come to?

What first conclusions can we draw?

II

[To be continued]

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