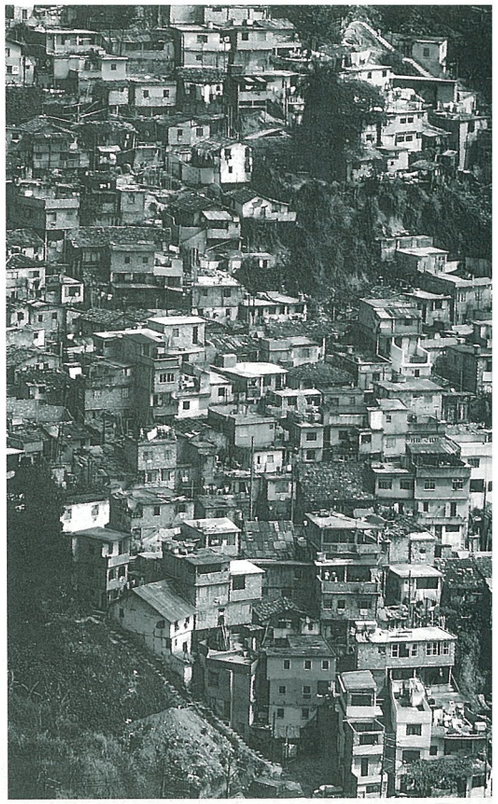
On 'The Invisible in Architecture': An Environment-Behaviour Studies Perspective

Amos Rapoport



This essay will be structured around the implications of the title of this book. This I do by taking the title literally as my topic and attempting to interpret what it might mean or imply in terms of Environment-Behaviour Studies (EBS). Thus, one immediate change is that I will be discussing 'the invisible in environmental design' (a second change will emerge later). I have thus moved from considering buildings to considering built environments in the broadest sense, which I take to be what geographers call cultural landscapes. There are a number of reasons for this among which only two will be discussed.

First, from my perspective any purposeful modification of the surface of the earth is design. In fact it is almost unnecessary to say 'purposeful' because people rarely or never engage in the difficult task of creating built environments without a purpose.**?**

Thus all man-made environments are designed in the sense that they embody human decisions and choices: essentially a choice among alternatives (what I call the choice model of design). This is a much broader definition of design than is common, but it is an essential one. Designed environments include the planting or clearing of forests, diversion of rivers and fencing of fields in certain patterns. The placement of roads and dams, gas stations and settlements, are all design. Roadside stands and second hand car lots (and roadside strips which they inhabit) are as much designed environments as office blocks and cultural centres. The work of a tribesman burning off, laying out a camp or village, and building his

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dwelling is as much an act of design as the designers' act of dreaming up ideal cities or creating 'significant' buildings. In fact the apparently mundane activities just listed have a much larger impact on the earth and people than the invention of ideal cities and grand buildings. The way cities, regions and whole countries look depends, in the final analysis on the design activity of many individuals over a long period of time.

What all this activity has in common is that it represents a choice out of all the possible alternatives, that it tends to be lawful and systematic, and that it results in the cultural landscapes we inhabit.

In order to understand Environmental Behaviour Relations (EBR) one must be able to generalise *en route* to the development of an explanatory theory. For such generalisation to be even minimally valid, and in order to identify patterns which play an essential role in research, it is essential to study this totality of environments which comprises most of what has ever been built. Yet it has been ignored: effectively it has been invisible. What has been studied is the work of a few designers, a minuscule portion of built environments. It is essential to study all environments, over the full span of their existence (almost 2 million years) and in all cultures.

This brings me to the second reason why it seems so essential to shift from buildings to cultural landscapes. People do not live in single buildings. They move from buildings to other buildings, to streets, to public spaces, transport, open spaces, countrysides – to many other 'settings'. People live in 'systems of settings', a partial visible expression of which is the cultural landscape. Architect-designed buildings and complexes both now and in the past, only make sense in their context, the matrix of the largely 'undesigned' (vernacular) landscape. This has major implications not only for theory but also for the study of the history of the built environment, which I cannot discuss here.★ Yet all these matters and the complex issues which they raise have been to a large extent ignored by the mainstream architectural literature – it is part of the invisible in architecture.

★ Rapoport, Amos. *History and Precedent in Environmental Design*, New York, 1990.

? *Wouldn't it make sense if we distinguish between different kinds of purposefulness? For the biologist no behaviour is without a purpose, but from the perspective of civilisation there is a big difference between the purpose of a shelter, and the purpose of a folly, both versions of an architectonic structure. Can you work with such a distinction?*

! There are certainly different kinds of purposefulness, but I would approach it differently. If one considers, as one must, all that has been built, then the body of evidence becomes very large and varied. The variability of built environments seen cross-culturally and historically is most striking. Much of this variability is due to the latent aspects of activities (their meaning) and thus linked to culture. Therefore, the shelter of one culture may be the 'folly' of another. Moreover, from my perspective 'shelter' is not a good term since a major function of housing (or dwelling) (as of all environments) is to communicate meanings. And at that level, 'shelter' and 'folly' may communicate the same meanings.

Environment-Behaviour Studies

Some summary statement is essential to provide a common framework within which my remarks can be interpreted and understood.

I take EBS to be the scientific study of EBR which is, by its very nature, highly interdisciplinary. Its purpose is to understand how people and environments interact and eventually to develop explanatory theory on the basis of which design can validly be done. From this perspective, design is concerned primarily with deciding *what* should be done and *why*. *How* comes later and is less fundamental.

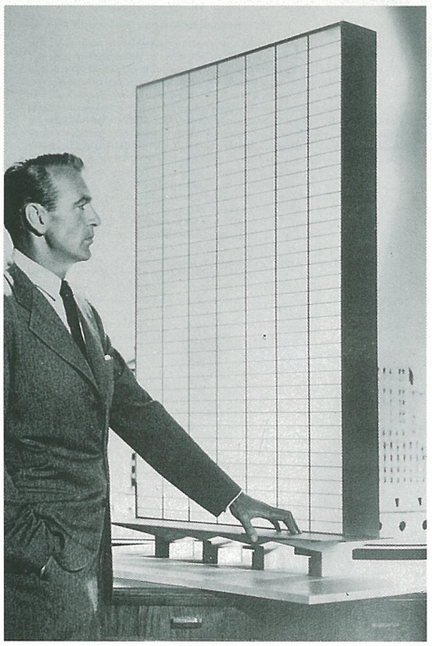
? *Do you think that creativity, which is the quality-measure of the 'how' in our society of the spectacle, is less important? You are using a strict hierarchy of practice, but doesn't the process have its own dynamics which influence the 'what'?*

! I regard the (pathological) preoccupation with 'creativity' to be a major problem with architecture. Others, mainly scientists, are much more creative without ever worrying about it. Creativity plays a major role in discovering the 'what' (and 'why') – in fact, that is far more creative than setting one's own (often meaningless) problems. Moreover, even the 'how' is amenable to scientific research – one could do a much better job in achieving one's objectives, which is what 'how' is, if they were explicitly articulated and justified. The 'how' must clearly come after the 'what'; its importance and whether and to what extent it may affect objectives is an empirical question. My own view is that it is more a constraint (among many others) than a determinant.

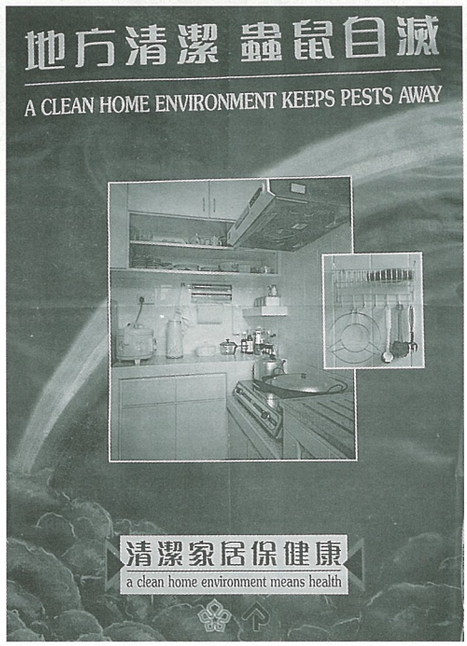
This implies that design is primarily problem identification and discovery and then problem solving on the basis of research-based knowledge, the best available knowledge, at any given time. This means that any single solution, how any individual goes about dealing with the problem (e.g. a building) is less important than what one could call the equivalent of 'public science', the disciplinary base.

As a discipline EBS, like other sciences, aims to be self-correcting and cumulative, so that knowledge improves over time. This cumulativeness and improvement occurs not only through basic and applied research but also through the application of research (i.e. design) and its evolution.

Design seen this way becomes the generation of hypotheses of the form: if so and so is done, such and



Still from the 'Fountainhead' by King Vidor, 1949



Public education Hong Kong, 1991

such will happen. It must, therefore, be evaluated and such evaluation made part of the knowledge base. Evaluation is a two-stage process. One first asks whether the objectives (which must be made explicit) have been met (and also, how we know). If so, the second question (whether the objectives are valid) follows, and how we know *that*. But this once again, if pursued, is another topic-although a critically important one. Note, however, that from the perspective point of view of the present topic, this process is far more important than any single solution which is the tangible concern of most study.

? *What interdisciplinary knowledge does help to evaluate the objectives?*

! EBS provides (in principle) that knowledge. It identifies the bio-social, psychological and cultural attributions of humans (question 1), the effects of given environments (question 2) and the nature of this mechanism (question 3). By using the best current knowledge, setting objectives, considering design as hypotheses and then evaluating these (in lieu of what is called 'criticism'), design itself would contribute to that interdisciplinary knowledge – it would become applied research (and research application) to complement basic pure research.

I have long argued that EBS can be understood, or conceptualised, in terms of three major questions:

1) What characteristics of people, as members of a species and various groups, and as individuals, influence (or, in design, should influence) how built environments are organised and shaped?

2) What effects do which environments have on the behaviour, mood, well-being, satisfaction and so on, of which groups of people, under what conditions, and so on?

3) A corollary question: given a mutual interaction between people and environments there must be a mechanism linking them. Given the importance of mechanisms in understanding and explanation, what are these mechanisms?

Clearly much could be said about this. Also, each can be researched, greatly elaborated, articulated, developed and clarified. But our present concern is the environment and its design. Here again I have

Peter Eisenman and Philip Johnson having lunch

Le Corbusier, housing estate, 60 years after opening (1926)

argued that the design of the environment is the organisation of four variables: space, time, meaning and communication. These are largely invisible.★ One can also think of environments as being about the relationships between people and people, people and things, and things and things. Relationships are also invisible. This brings me to the first of my two major possible interpretations of 'invisible' within this framework.

The Invisible in Human Interaction with the Environment

I will mention just a few examples of invisibility starting with relationships. It has been argued, as I have done several times, that cultural landscapes (for example urban landscapes) have more to do with relationships among elements than with the nature of the elements. When elements are for example made of materials regarded as bad, the sometimes outstanding relationships are not seen. Examples might be spontaneous settlements in developing countries, markets composed of boxes and torn sacking and so on, which yet produce superb settings which work extremely well.**?**

★ It is often thought that space is visible but it is not; it is the hardware surroundings or enclosing space which is visible and even then the conceptual organization of the space is not visible. The fact that space can be effectively invisible is well shown by the case of the Maori Marae studied by Michael Austin among many other examples.

? *In which sense?*

! They work extremely well in the most important sense of being supportive for the lifestyle and activities of people (including the latent aspects of these activities), by being culture-specific, by communicating their meanings effortlessly and extremely efficiently. They also often work extremely well even at the formal level – in their relation to site, light, and shade, spaces, massing, solid/void relationships, colour and so on. Even at that (mainstream architecture) level I would argue (as a subjective hypothesis, because this has not been researched empirically) that they often work far better than anything architects have done for a long time (see my 'Spontaneous Settlements as Vernacular Design', in C.V. Patton (ed.), *Spontaneous Shelter,* Philadelphia 1988, pp. 51-77).

Other examples are provided by buildings which are seen as hovels because built of materials regarded as bad, having earth floors, no services, etcetera, when they are really environments of great quality which work superbly in terms of their congruence with lifestyle and culture generally, communicate clearly to users, climatically and in other ways. Many environments like these, and historically they are the overwhelming majority, which have much to teach us, have effectively been invisible. The evidence is that the architectural literature ignores them.

There are other reasons why certain environments are effectively invisible. Because of ethnocentrism one often fails to understand environments to the extent that one does not really see them. For example, one may look for a geometric order basic in one's own culture, in cases where the order is cosmological as is the case in most traditional preliterate or vernacular situations. Since one then finds no order, these environments are dismissed and effectively become invisible. Alternatively instead of a geometric order, the order is social. This again is the case in many traditional settlements. Again, the environments are rejected, ignored and become effectively invisible.

Australian Aborigines build relatively little – the visible built environment appears insignificant.

Yet they have a most complex culture and an extremely rich and complex cognitive environment. They live in an 'invisible landscape in the head' which is overlaid, as it were, over the natural visible landscape, overlapping, coinciding and being congruent with it at certain visible features. In this way the apparent barren and empty natural landscape is transformed cognitively, becoming endowed with extraordinary meaning, given great temporal depth and being humanised. None of this is visible to the outside (European) observer for whom there is nothing there.

? *From an anthropological point of view you may be right. But how do you consider the chaotic development of the late-capitalist periphery of the modern megalopolis? What is the organisational principle there. Here it seems that the hidden dimension is less human instead of more.*

! Your question perfectly illustrates my point above: you find the development of the periphery of the modern metropolis 'chaotic' because you dislike it, find it incomprehensible or unacceptable. Others do not – or it would not be built. People are abandoning those areas in which you like to live, shop, eat, etcetera for the periphery. Moreover, there is a clear order; this is shown by the fact that we use the periphery so effectively (often more so than older areas). There are, of course, many things wrong with it (possibly). The approach to that, however, is not to call it 'chaotic' but to understand it and the rationale behind it, and see whether one can do better. Attacking it is not going to change it, but if designers cannot suggests improvements they should not be in business.

? *You are emphasising the collective basis of design, the sharing of cognitive schemata as the basis for collective behaviour. But in the mainstream architecture of today unique individual creativity as a notion prevails. So while you mention what most literature overlooks, the authors could blame you for leaving out the need for uniqueness and distinction.*

! I see designing as a science-based profession, which at the moment doesn't have the base that it needs. To deal with problems, to understand it, even enhance it by suggesting other ways of doing things, one needs to have really basic fundamental knowledge which at the moment is totally lacking, and I believe personally that even art can be studied scientifically with very beneficial results. I'm not saying art is a science: you see that's why I'm constantly separating the disciplinary base from the individual designer working within it. If you read the literature on creativity what becomes very interesting is that creativity in science and in art is very similar and that descriptions of the ways artists and scientists work are extremely similar; the difference is that artists essentially put forward their individual intuitions, while in science these intuitions are first tested by the people themselves, and then by the people around them before they are admitted into the canon. And at that point, the question of where architecture fits becomes much more critical because I think it fits much more in the second than in the first.

This pattern is not unique to Aborigines. They can be created through naming, as they have been in many immigrant countries, for example the United States, how the landscape is actually transformed to express the images and schemata brought by immigrants who also express those through naming. It begins to be designed in my sense. In these cases, what is an incomprehensible landscape, and hence invisible★, is made visible by being transformed into familiar forms.

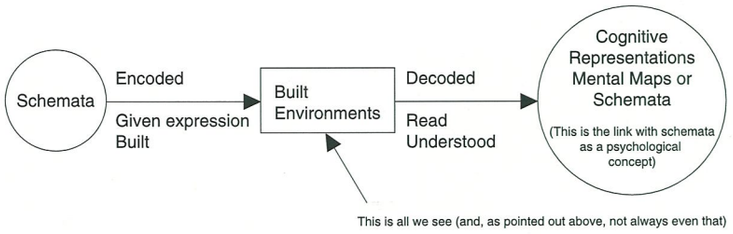
★ The history of painting in Australia shows that the landscape was effectively invisible for quite a few decades.

But there is a more important implication of the above discussion than that such landscapes are invisible. It follows that there are no such things as disorderly or chaotic cultural landscapes. The order can, however, be so incomprehensible or unacceptable that they are rejected and ignored to the extent that they become effectively invisible.? These various forms of 'invisibility' in people's interaction with built environments all relate to a single point. This is that all built environments are concrete expressions of *schemata* – a term I have already mentioned. I use this term in its 'cognitive anthropology' sense. In that sense a schema is some very abstract notion of how things should be. As such, schemata are a rather difficult and high-level concept, and there are a number of intermediate steps between schemata and their product. This material expression of schemata is usually imperfect (almost in the Platonic sense). Strong support for the existence of schemata is provided by cultural landscapes. These are never 'designed' in the sense of the common use of the term (and never by a single designer).★?

Of course, in most cases, all these invisible things: order, relationships, schemata, and so on, are made visible to some extent, they are translated into form. While the product is always at least potentially visible, it is the result of invisible processes which are however an essential part of the product. In the definition of vernacular design and spontaneous settlements (and this also applies to high-style, popular and other environments) process variables are at least as important as product characteristics.

★ An interesting comparison is with large-scale landscapes designed by professionals (e.g. those of the eighteenth and nineteenth century English country house estates). There the existence of a schema is quite clear. This concept is also very useful in interpreting many other studies of traditional architecture, e.g. Wittkower's study of Renaissance churches among others.

It has been my suggestion (and this is simplified for the purpose of this essay) that schemata are translated into built environments, which if they communicate (and currently they often do not) generate appropriate schemata in users' minds. This can be shown through a diagram I have used before:



Effectively environments are thought before they are built. Typically one wraps hardware, as it were, around schemata and cognitive domains and we have seen that Aborigines (amongst others) hardly build, although they establish 'place' or settings in many ways. They just do not wrap hardware around settings. This idea is not new. We find it even in a CIAM book of the fifties which, as an epigraph, gives a child's definition of a cannon as a hole with metal wrapped around it.★ The difference is that we now have concepts such as schemata and methods for studying them. I have made the point that schemata are rather high-level, abstract concepts with a number of intermediate steps involving possibly lower-level concepts, such as images or cognitive domains, between them and built environments. One way of thinking about the creation of built environments is that hardware is being put around cognitive domains of various sorts. These can be domains such as private/public, male/female, front/back, sacred/profane, and so on; or such as living room, bedroom, office, men's house, and so forth, depending on the culture. These then enclose behaviour, and while some behaviour can be seen, some cannot. Behaviour is also typically missing in architectural literature and illustrations (whether criticism, history, or 'theory'); it is effectively invisible.

★ A similar point is made by Amos Chang in his application of Lao Tze's philosophy to the study of architecture (in his *The Existence of Intangible Content in Architectonic Form*).

Yet behaviour is the essence of the built environment, its *raison d'être*. Also, behaviour can occur without, or with minimal built environments, as in the case of the Aborigines or outdoor markets, for exam-

ple, where the behaviour itself defines the place or setting. It is, however, important to note that environments do not just enclose behaviour. The way one usefully thinks of this in EBS is that built environments provide settings for behaviour. These can be supportive, or alternatively, inhibiting of various behaviours. In many cases, settings are not visible-and supportiveness never is. *Settings* also act as mnemonics, reminding people of how to act thus making co-action possible. This is a very important purpose of built environments and depends on visibility – it requires cues which are noticed and understood. These define the situation and guide behaviour. But these visible cues are only the tip of the iceberg; the invisible is most important. Moreover, in many of the more traditional ('exotic') situations used by anthropologists and by me, the cues can become extremely subtle, almost invisible and, in some cases, completely invisible. Being 'extreme' such cases show things more clearly.

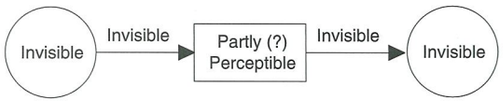
Recall that the cues are the property of settings. What we see are buildings (offices, hospitals, shops, dwellings etcetera), streets, suburbs, neighbourhoods, cities and so on. But first, these all represent schemata, cognitive concepts etcetera which are variable, so that we do not actually see these, we construe or infer them.**? ?**

But secondly, and more important, one is really dealing with settings supporting behaviour; each of these environments (such as a building) consists of very many settings. Moreover, settings are often invisible, because the same space can become a different setting without the fixed-feature elements

changing. Often only the semi-fixed feature elements (furnishings' in the broadest sense) change the non-fixed feature elements (people and their behaviour). Architecture, however, is typically primarily concerned with fixed-feature elements. The 'invisible' in this case is what environments are all about – and they support and guide behaviour. Moreover, these settings are linked into systems through human-behaviour which is often invisible

The Role of the Invisible in Design

To deal with behaviour and the like in design (in the broad sense in which the word is used here) one needs high-level principles of concepts based on research, knowledge, generalisation and theory. This is so that a relatively manageable number of such concepts can be applied to the very many specific cases without each becoming unique. This means that concepts and theory are most important. But these are not objects, and hence not tangible or visible. This also applies to the human responses to the environment which are the *raison d'être* for design – clear schemata, satisfaction, pleasure, supportiveness, understanding, appropriate meanings, and so on. In terms of the previous diagram:



? *On the one hand you refer time and again to the reliability of theory as the basis of design, on the other hand your theory is very nominalistic. You define the environment as a mental construct. If you are right, how then can we really bother about the deplorability of architectonic culture? For you don't have an absolute standard to judge its moral deficiency.*

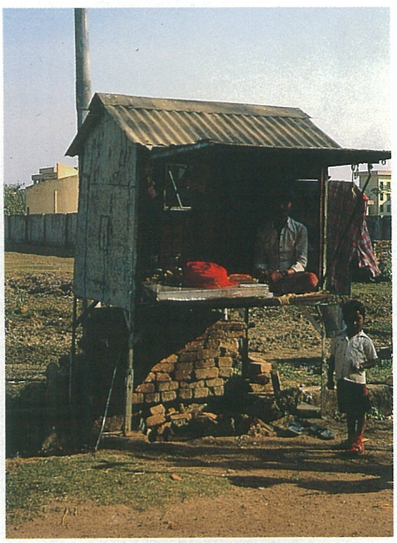
! My position is that designers are surrogates for users. In other words we are hired to do things that users either don't or can't do for themselves. Therefore it seems to me that the ethical obligation and the intellectual challenge is to try and understand what users would have done if they were doing it themselves. One of the big problems one then has is of course the problem of the unknown user. Many modern buildings are designed for known clients but unknown users. Again there is a problem of generalisation: what do people in general require? So the first thing, it seems to me, is that we need to understand how to design for people who are very different from ourselves. There is a distinction between the individual person, solving a problem, doing a design, and the public discipline, which sets the framework for it. I think we very often confound the two.

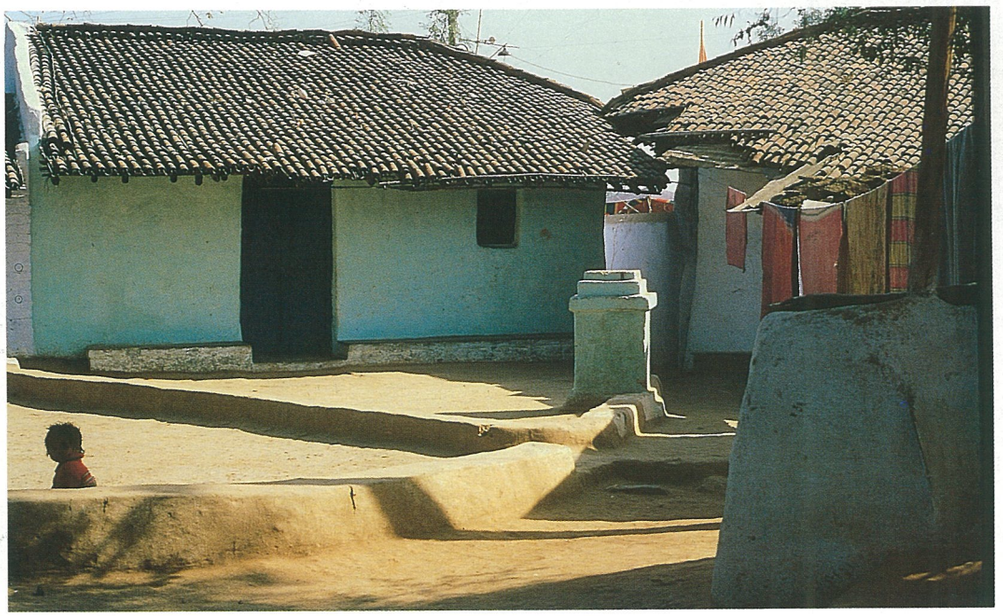
? *Architecture is not only built as an answer to material needs, but is also a matter of taste. How can we escape the preoccupations which are involved here? Even if an architect responds exactly to what people want, it is possible that what they want is bad.*

! I have actually emphasised above that design is not merely for material or instrumental needs (in criticising the use of 'shelter'). It is for the satisfaction of many latent functions, which include meaning. I have also emphasised that wants tend to be more important than needs. This is what you call 'taste'. But it is 'users' wants and tastes that are critical, not designers'. From that point of view a good design may be one the designer personally hates – his tastes are totally irrelevant. As for wants being 'bad' it is essential to be certain that they *are* bad – and *why*; this needs knowledge. I predict that most wants are not bad, only disliked by designers (like orders). If wants, however, are bad – and this needs to be demonstrated beyond reasonable doubt on the basis of evidence, data etcetera – one needs to understand what these wants express and to try and achieve them in different (and possible less 'bad') ways. Real creativity is to be found in this process of analysis and response. Finally, I agree that no professional ever gives anyone 'exactly what they want'. But professionals do not disregard wants, either.

In one sense one could say that built form relates two invisibles and the linkages between them are also invisible. Their understanding requires theory and this becomes the critical aspect of design understood as the translation of schemata, cognitive domains, images and the like into built form and the ability to achieve the proper human responses to such built environments. This is design conceived as a science-based profession based on explanatory theory (theory in a scientific sense). In this, the tangible, visible aspects are a relatively small part of the whole. Theory of that type consists of constructs and concepts related to each other in complex ways which are all invisible. The whole structure is linked to the concrete, empirical world which, ultimately, is tangible and hence perceptible. Theory and knowledge are both vast abstract domains and hence invisible, yet they must be the basis of design.

The left-hand side of the above diagram, which is where design occurs, can be of different kinds. In the traditional vernacular situations, in the case of buildings and in the case of cultural landscapes more generally, the users and designers were the same. The process occurs over long time-periods and is *selectionist.* What I mean by this is that it gradually achieves congruence with users' wants, needs, lifestyle, ideals, schemata, and so on in an almost 'evolutionary' way through many decisions and modifications over long time periods. In traditional architectural design, designers and users, while distinct, were close in sharing values, schemata etcetera; designers also were concerned with very few types of settings. Currently designers operate as surrogates for users, there are multiple groups of those and





designers as a whole are very different indeed from users as a whole. Moreover, designers are expected to design types of settings which they never did in the past. As a result, they operate in a *instructionist* mode – they need to provide instructions for the organisation of system of settings over very short time periods.★ The only basis on which this can be done validly for people very different from designers, with highly varied cultures, schemata, values, lifestyles and so on, and who are often not known individually, is through knowledge based on research. The task is to know *what* to do and *why*.

But knowledge based on research also seems critical in the process of achieving the objectives once set – the how. Not only is this amenable to research but it crucially depends on it. One needs such knowledge in order to know how to achieve given objectives and whether people will like them, whether they will prove supportive. One needs knowledge of the repertoires of means available, how people perceive, how they recognise, how meaning is communicated and what meanings are communicated by which cues, to whom and under what conditions; what effects which environments have on which people and under what circumstances – and how important these effects are and so on.

Research is essential for all aspects of this facet of design. Research is essential in order to know whether one has achieved the objectives and if not, why not. Research from an EBS perspective even changes the

★ These terms, from molecular biology, were proposed by Lederberg (cited in Jacob, F, *The Possible and the Actual*, New York, 1982, p. 15-17. Although they refer to very different processes I first applied them through analogy in my 'Culture and built form – a reconsideration' in Saile, D.G. (ed.) *Architecture in Cultural Change*, Lawrence, 1986, p. 157-175.

way one thinks of perception: it makes one question the term 'visible' (the second of the changes to my title). From that point of view even visual perception is dynamic rather than static, and hence very different indeed to what is considered in mainstream design. Much more important however is the multisensory nature of perception. The physical, tangible built environment is more than its visible shape.

I would argue that a most neglected aspect of environmental perception, the perception of the built environment as artefact (in itself a small part of EBR) is its multisensory nature: it is much richer than merely vision. Environmental perception involves sound and the acoustic quality of environments, smells, textures, and tactile characteristics, thermal qualities, in general and of surfaces, air movement, kinetics; the only sense not directly involved seems to be taste. Also involved are light quality, views out, and so on, that are rarely considered in architectural criticism, history or theory.**? ?**

In effect one should speak not of visible but rather of sensible or perceptible. The preoccupation with vision to the exclusion of other sensory modalities in Western design and ignoring the combined effects of the various senses is a serious lacuna. Also while the emphasis on the visible implies an excessive preoccupation with aesthetics. From an EBS viewpoint, this can be studied in the sense of experimental aesthetics, or by shifting to the use of concepts such as 'environmental quality'. These can be conceptualised as profiles consisting of many variables, only some of which may be perceptual qualities. Thus, the relative contribution of appearance and the like to preference and satisfaction becomes a researchable question and can be identified for various cases.

Also, while perception is almost by definition sensory and is most important to the way designers judge environments, it appears that most users react to environments quite differently – through their associational aspects. In other words, the physically perceptible elements and characteristics are cues which communicate meanings – and meaning is one of the most important mechanisms linking people and environments. It is users' meanings that influence preferences and evaluation through various levels of meaning related to identify, status, guides to behaviour in the settings etcetera. Therefore not only does the emphasis on the visible perpetuate the visual bias of designers at the expense of other sensory modalities, more important, it is misleading in the necessary understanding of users' interactions with built environments. While designers judge environments in the perceptual mode, users do so in the associational. I cannot develop the topic meaning here. I will only say that meaning is not additional to function.**?**

More important is that meaning is at the latent end of the function, behaviour and activities, away from the instrumental or manifest pole – and latent means hidden, non-obvious, and hence invisible. More specifically I divide activities into four levels, the variability of which goes up as one moves up from, (1) the activity itself (its manifest of instrumental aspects), (2) how it is carried out, (3) how associated with others into activity systems, and (4) the meaning of the activity (its latent aspects). The cultural specificity of environments is related to latent aspects of behaviour and leads to the extraordinary variety of environments. This variability is one of their most striking characteristics and raises most important questions about them. Because these latent aspects explain the variability of settings for the relative few things people do, they become most important in shaping environments.

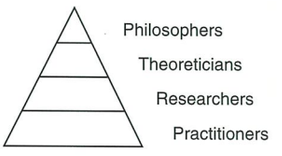
Conclusion

My main argument in this brief and simplified essay is that the physical expression of design – built environments of cultural landscapes (let alone buildings) – forms only a small part of the whole domain, and not the most important one. This is even the case for users: their experience of the environments and their relationships with those goes far beyond the hardware. More important, however is the implication that most of what professionals need to know, understand and explain in order to be able to design validly and responsibly has little to do with artefacts which presently occupy them to the exclusion of anything else. It is what cannot be seen which is clearly by far the most important part of the design process in the sense that I use it – design for users as a science based, responsible profession based on a research-based discipline.

I have argued that research is needed for various reasons, and only mentioned a few of those. A major point is that *what* to do and *why* is far more important than how to do it – which is what typically preoccupies designers. The 'what' is the problem to be solved and the proposed solution; 'why' addresses the justification for the identification of the problem and rationale for the solution – and problem identification is possibly the critical issue. Problems cannot be set arbitrary as they typically are but need to

? *Why is this? Could you give an historic explanation of the present-day ignorance of architectural practitioners?*

! No, I cannot, since I have not studied this. I have however, suggested that it occurred when architecture, unlike other disciplines, rejected science. One result was that, unlike real disciplines, it only has practitioners. Other fields have begun to redress the balance. For example geography. Two geographers, Abler and Gould, have suggested that any real discipline must have four types of people:



They argued that in geography there were many researchers but the other three groups were lacking and that the field should begin to redress the balance; it has done so. In architecture there are practitioners but I believe the other three are lacking; they are badly needed. EBS now has researchers but theoreticians and philosophers are still missing.

? *But why is there a lack of theoreticians and philosophers in architecture? And aren't the idiosyncratic architects on the tip of the iceberg, the Deconstructivist or the Heidegger-inspired phenomenologists, the philosophers you are talking about?*

! No. This kind of philosophy is *not* what I am discussing. From my perspective the less said about Heidegger, phenomenology, deconstruction and the like – the better. I refer to the carefully worked out philosophical foundations of a given theoretical discipline, for example the philosophy of biology as an aspect of the philosophy of science. The latter is the only branch of philosophy (and needs to be combined with other fields) that I regard as relevant to the types of things I am discussing. Personal 'philosophies' or 'theories' have no connection at all with the public, communal, cumulative enterprise of theory building on the basis of empirical research and conceptual analysis. That, I would argue, is the only thing worthy of the name theory. The subjective positions that masquerade as 'theory' of 'philosophy' are just personal views based on no data or evidence or serious conceptual analysis.

? *So you will not agree with most architectural theory of the recent past, in which the need of symbolism on the façade has been emphasised? In fact, this statement of yours implies a strong dissatisfaction with any notion of meaning as an architectural element, whereas you will opt for meaning as a dimension of architecture?*

! Of course I take a very different approach to meaning than most, particularly in rejecting linguistic models and semiotic approaches in favour of non-verbal communication models. But that is another story. I have told that story in a book, and can only refer readers to it: Amos Rapoport, *The Meaning of the Built Environment,* Tucson 1990 (updated version). There are also several papers but the essence of my argument and approach is in the book mentioned.

Sao Paulo

? *In mainstream architectural thought many aspects, dimensions and factors are effectively overlooked, as you say. What could be the interest behind this narrow vision? Another question is: what does the monomaniacal attention to the 'tip of the iceberg' actually produce? Does it have any positive side-effects, according to you?*

! I cannot answer the first part of your question – I do not know, and the reason is that I am really not interested so that I have not looked into it. It seems enough, for my purpose, to have identified the problem and the current situation. My answer to the second half of the question is rather brief: No!

? *Cinema?*

! You misunderstand my point: I am talking about the process of creating built environments. As the next line indicates one is dealing with conceptual structures and these cannot be filmed. As far as the products of design are concerned cinema or videotape may be somewhat better and holograms better yet. Acoustic quality could possibly be recorded and communicated. This still neglects the other senses – smell, kinesthetics, temperature and wind, tactile qualities etcetera. There may well be adequate technologies available now or in the future which are helpful in communicating the *ambiance* of settings which is multisensory. Even then, however, they would lack an important aspect of human interaction with the built environment – that it is active and hence dynamic, involving sequences of activities within systems of settings; that it is purposeful and goal-oriented and hence very different from the contemplation of images. But even the best of such technologies only deal with the perceptual product – which, I have been arguing, is a minute part of the field.

be identified on the basis of knowledge of the potential users and of EBR theory. It is only the final part of the solution, a very small part, although an important one, (because it is what one lives in) which is concerned with the hardware. It is only that part which is perceptible, i.e. capable of being grasped through the senses. And even that has to do with relationships and many other qualities which, I have argued, are only partially perceptible. Moreover, they are ignored in the material typically discussed by the mainstream literature. It follows that as analysts and researchers, and as designers, we cannot stop with the perceptible – and certainly not in the narrow sense currently used.

I have argued that *how* one goes about solving a specific problem, which is closest to traditional concerns of mainstream design, can be researched and can be approached scientifically, indeed it must be. Any term, for example 'privacy', has major conceptual complexity and is linked with other concepts in a theoretical structure. The physical elements provided to help achieve it (i.e. solve the problem) are only a small part of it. Thus the physical and the conceptual are rarely fully congruent or coincident – and do not need to be highly so. This is because most such concepts are highly variable, for example cross-culturally, and cannot be assumed, guessed or based on intuition. In the case of privacy, for example, the mechanisms may not involve martial means, as I and others have shown.

To understand that many concepts which design needs to address and satisfy require research and analysis not only of the concepts themselves but of the relationships between them and the physical equivalents or expressions. Design is much more than the arbitrary assembling of physical elements to satisfy designers' arbitrarily posed problems.**?**

I return to the three basic questions of Environment-Behaviour-Studies in terms of which the field, its domain and its theory can be understood and articulated: 1) human characteristics: perceptual, cognitive, cultural, lifestyle, etcetera, 2) effects of environment on people, choice, criticality, etcetera,

3) mechanisms linking people and environments, perception, cognition, meaning, instrumental, etcetera.

Each of them is very complex but comprehensible and researchable. They are not however, immediately (if at all) perceptible in the built environment one encounters.

The essence of the process of creating built environments and experiencing them is invisible. No photograph in a journal or book, and no slide can show these.**?** They require modes of representation and manipulation as complex as they are. One is dealing with conceptual structures, not material ones. The research needed to understand these processes at a sufficiently rigorous level to generate usable explanatory theory is also highly abstract and cannot be seen in the actual environment, although its role in creating acceptable settings is crucial. The built environment can only be understood as the final material manifestation or expression of a largely non-perceptible domain.