

Introduction

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For the most part, the design of an artefact – whether it is a bridge, a cup or a surgical instrument – has a certain logic to it. First, *functional* objectives must be achieved: materials or elements must be assembled into a form which works for a well-defined purpose, or range of purposes. When this is done, a second dimension may be added: that of *style*. By this we mean that decoration, embellishments, or even modifications of shape, can give the artefact a significance over and above its practical uses, one belonging to the realm of cultural identity or ‘meaning’. Sometimes, of course, it is difficult to tell which aspects of an artefact belong in which realm. But there is never any doubt that the artefact does belong to two realms. Invariably, artefacts are both functional and meaningful. Insofar as they are the first, they are of practical use; insofar as they are the second, they are of primarily social use, in that they become a means by which cultural identities are known and perpetuated.

At first sight, this simple scheme might seem to apply *par excellence* to that most omnipresent of artefacts, the building. Buildings are, after all, expected to function properly, and their appearance is often held to be such an important aspect of culture as to be a constant source of public controversy and debate. But it is not quite so simple. Buildings have a peculiar property that sets them apart from other artefacts and complicates the relation between usefulness and social meaning. It is this. Buildings may be comparable to other artefacts in that they assemble elements into a physical object with a certain form; but they are incomparable in that they also create and order the empty volumes of space resulting from that object into a pattern. It is this ordering of space that is the purpose of building, not the physical object itself. The physical object is the means to the end. In this sense, buildings are not what they seem. They appear to be physical artefacts, like any other, and to follow the same type of logic. But this is illusory. Insofar as they are purposeful, buildings are not just objects, but transformations of space through objects.

It is the fact of space that creates the special relation between

function and social meaning in buildings. The ordering of space in buildings is really about the ordering of relations between people. Because this is so, society enters into the very nature and form of buildings. They are social objects through their very form as objects. Architecture is not a 'social art' simply because buildings are important visual symbols of society, but also because, through the ways in which buildings, individually and collectively, create and order space, we are able to recognise society: that it exists and has a certain form.

These peculiarities of buildings as artefacts lead to a very special problem in trying to understand them, and even in trying to talk about them analytically. It is a fairly straightforward matter to talk about artefacts in general, because in so doing we are talking about objects, and the important properties of objects are visible and tangible. But in talking about buildings, we need not only to talk about objects, but also about systems of spatial relations.

Now it seems to be a characteristic of the human mind that it is extremely good at using relational systems – all languages and symbolic systems are at least complex relational systems – but rather bad at knowing how to talk about them. Relations, it seems, are what we think *with*, rather than what we think *of*. So it is with buildings. Their most fundamental properties – their ordering of space into relational systems embodying social purposes – are much easier to use and to take for granted than to talk about analytically. As a result, the discourse about architecture that is a necessary concomitant of the practice of architecture is afflicted with a kind of permanent disability: it is so difficult to talk about buildings in terms of what they really are socially, that it is eventually easier to talk about appearances and styles and to try to manufacture a socially relevant discourse out of these surface properties. This cannot be expected to succeed as a social discourse because it is not about the fundamental sociology of buildings.

At most times in the past, this disability might not have mattered. After all, if intuition reliably reads the social circumstances and reproduces them in desirable architectural form, then architecture can be a successful enterprise. But this is not the case today. Since the Second World War, our physical environment has probably been more radically altered than at any time since towns and cities began. By and large, this has been carried out on the basis of an architectural discourse which, for the first time, stresses explicit social objectives. Yet it is exactly in terms of its long-term social effects that the new urban environment has been most powerfully criticised. There is a widespread belief that we are faced with a problem of urban pathology, which results at least in part from the decisions of designers and the effects, for the most part unforeseen, of new building forms on the social

organisation of space. In these circumstances an explicit discourse of architectural space and its social logic is an absolute requirement.

But in spite of its centrality in the act of creating architecture, and in its recent public pathology, the question of space has failed to become central in the academic and critical discourses that surround architecture. When space does feature in architectural criticism, it is usually at the level of the *surfaces* that define the space, rather than in terms of the space itself; when it is about space, it is usually at the level of the *individual* space rather than at the level of the system of spatial relations that constitute the building or settlement. As a result, a major disjunction has developed not only between the public pathology of architecture and the discourses internal to architecture, but also between the practical design and experience of buildings and these discourses. This disjunction is made worse by the persistence of an analytic practice conducted first through images, then through words; and neither images nor words responding to those images can go beyond the immediate and synchronous field of the observer into the asynchronous complex of relations, understood and experienced more than seen, which define the social nature of buildings and settlements. The rift has become complete as discourse tries to lead the way back into classicism – as though cosmetic artistry would cure the disease as well as beautify the corpse.

The architectural critic is, of course, handicapped by the representations of architecture with which he works. The only representative of spatial order in the armoury of the critic is the plan. But from the point of view of words and images, plans are both opaque and diffuse. They convey little to the image-seeking eye, are hard to analyse, and give little sense of the experiential reality of the building. They do not lend themselves easily to the art of reproducing in words the sentiments latent in images which so often seems the central skill of the architectural critic. Accordingly, the plan becomes secondary in architectural analysis. With its demise, those dimensions of the buildings that are not immediately co-present with the observer at the time that he formulates his comment are lost to discourse. In this way, architectural discourse conceals its central theme.

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In architecture space is a central *theoretical* discipline, and the problem is to find a way to study it. But the problem of space itself is not confined to architecture. In anthropology, for example, it exists as an *empirical* problem. The first-hand study of a large number of societies has left the anthropologist with a substantial body of evidence about architectural forms and spatial patterns,

which ought to be of considerable relevance to the development of a theory of space. But the matter is far from simple. The body of evidence displays a very puzzling distribution of similarities and differences. If we take for example the six societies in Northern Ghana whose architecture has been studied by Labelle Prussin, we find that within a fairly restricted region with relatively small variations in climate, topography and technology, there are very wide variations in architectural and spatial form, from square-celled buildings arranged in dense, almost town-like forms, to circular-celled structures so dispersed as to scarcely form identifiable settlements at all.¹

But no less puzzling than the differences within the same ecological area are similarities which jump across time and space. For example, villages composed of a concentrically arranged collection of huts surrounding one or more central structures can be found today as far apart as South America and Africa (see Figs. 30 and 133) and as far back in time as the fourth millennium BC in the Ukraine.² Taking the body of evidence as a whole, therefore, it seems impossible to follow the common practice when faced with an individual case of assuming architectural and spatial form to be only a *by-product* of some extraneous determinative factor, such as climate, topography, technology or ecology. At the very least, space seems to defy explanation in terms of simple external causes.

Aware of these difficulties, certain 'structural' anthropologists have suggested another approach. Lévi-Strauss for example, taking his lead from Durkheim and Mauss, saw in space the opportunity to 'study social and mental processes through objective and crystallised external projections of them'.³ A few anthropologists have pursued this, and there now exists a small but growing 'anthropological' literature on space. However, as Lévi-Strauss indicated in the same article, there are unexpected limitations to this approach. Lévi-Strauss had already noted in reviewing the evidence relating social structure to spatial configuration that 'among numerous peoples it would be extremely difficult to discover any such relations . . . while among others (who must therefore have something in common) the existence of relation is evident, though unclear, and in a third group spatial configuration seems to be almost a projective representation of the social structure'.⁴ A more extensive review can only serve to confirm this profound difficulty and add another. Seen from a spatial point of view, societies vary, it seems, not only in the type of physical configuration, but also in the degree to which the ordering of space appears as a conspicuous dimension of culture. Even these differences can take two distinct forms. Some societies appear to invest much more in the physical patterning of space than others, while others have only seemingly informal and 'organic' patterns, while others have clear global, even geometric forms; and some

societies built a good deal of social significance into spatial form by, for example, linking particular clans to particular locations, while others have recognisable spatial forms, but lack any obvious investment of social significance.

In studying space as an 'external projection' of 'social and mental processes' which by implication can be described prior to and independent of their spatial dimension, it is clear that structural anthropologists are therefore studying the problem of space neither as a whole nor in itself: the first because they are concerned chiefly with the limited number of cases where order in space can be identified as the imprint of the conceptual organisation of society within the spatial configuration; the second because they still see space as a by-product of something else whose existence is anterior to that of space and determinative of it. By clear implication this denies to space exactly that descriptive autonomy that structuralist anthropology has sought to impart to other pattern-forming dimensions of society – kinship systems, mythologies, and so on. Such studies can therefore contribute to the development of a theory of space, but they are too partisan to be its foundation.

The anthropological evidence does, however, allow us to specify certain requirements of a theory of space. First, it must establish for space a *descriptive autonomy*, in the sense that spatial patterns must be described and analysed in their own terms prior to any assumption of a determinative subservience to other variables. We cannot know before we begin what will determine one spatial pattern or another, and we must therefore take care not to reduce space to being only a by-product of external causative agencies. Second, it must account for wide and fundamental variations in morphological type, from very closed to very open patterns, from hierarchical to non-hierarchical, from dispersed to compressed, and so on. Third, it must account for basic differences in the ways in which space fits into the rest of the social system. In some cases there is a great deal of order, in others rather little; in some cases a great deal of social 'meaning' seems to be invested in space, in others rather little. This means that we need a theory that within its descriptive basis is able to describe not only systems with fundamental morphological divergencies, but also systems which vary from non-order to order, and from non-meaning to meaning.

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Several attempts have been made in recent years to develop theory and method directly concerned with the relation between society and its architectural and urban forms. Before going on to give a brief account of the theory and method set out in this book, some review of these is needed, if for no other reason than because

in our work we have not found it possible to build a great deal on what has gone before. The general reason for this is that, although these various lines of research approach the problem of space in a way which allows research to be done and data to be gathered, none defines the central problem in the way which we believe is necessary if useful theories are to be developed. In spite of their considerable divergencies from one another, all seem to fall into certain underlying difficulties with the problem of space which we can only describe as *paradigmatic*. The approach is defined not out of the central problem of architecture itself, in the sense that we have defined it, but out of a set of more philosophical presuppositions about the nature of such problems in general.

By far the best known candidate for a theory which treats space directly as a distinct kind of social reality, and the one that has influenced architecture most, is the theory of 'territoriality'. This theory exists in innumerable variants, but its central tenets are clear: first, the organisation of space by human beings is said to have originated in and can be accounted for by a universal, biologically determined impulse in individuals to claim and defend a clearly marked 'territory', from which others will be – at least selectively – excluded; and, second, this principle can be extended to all levels of human grouping (all significant human collectives will claim and defend a territory in the same way that an individual will). The theory proposes in effect that there will always be a correspondence between socially identified groups and spatial domains, and that the dynamics of spatial behaviour will be concerned primarily with maintaining this correspondence. It asserts by implication that space can only have social significance by virtue of being more or less unequivocally identified with a particular group of people. A whole approach to urban pathology has grown up out of the alleged breakdown of territorial principles in our towns and cities.⁵

An obvious trouble with territoriality theory is that, because its assumption is of a universal drive, it cannot *in principle* account for the evidence. If human beings behave in one spatial way towards each other, then how can the theory be used to account for the fundamental differences in physical configuration, let alone the more difficult issues of the degree to which societies order space and give significance to it? How, in brief, may we explain a variable by a constant? But if we leave aside this logical problem for a moment and consider the theory as a whole, then it becomes a little more interesting. As we have said, the theory leads us to expect that 'healthy' societies will have a hierarchically organised system of territories corresponding to socially defined groups. Now there are certainly cases where such a system exists, and others where it exists alongside forms of group organisation that lack a territorial dimension. But the extension of this to the level of a general principle overlooks one of the most

fundamental distinctions made by anthropologists: the distinction between groups that have a spatial dimension through co-residence or proximity, and groups whose very purpose appears to be to cross-cut such spatial divisions and to integrate individuals across space – ‘sodalities’ as some anthropologists call them. It is in the latter, the non-spatial sodality, that many of the common techniques for emphasising the identity of social groups – insignia, ceremony, statuses, mythologies and so on – find their strongest realisation, most probably for the obvious reason that groups that lack spatial integration must use other, more conceptual means if they are to cohere as groups. Now this leads to a problematic yet interesting consequence for territoriality: social identification and spatial integration can often work in contrary directions, not in correspondence as the theory requires. It has even been suggested that sodality-like behaviour in social groups varies inversely with spatial integration: the more dispersed the group, the more sodality-like the group becomes.⁶ In other words, territoriality appears to be not a universal group behaviour but a limiting case, with the opposite type of case at least as interesting and empirically important.

Territory theory, especially in its limitations, might be thought of as an attempt to locate the origins of spatial order in the individual biological subject. Other approaches might be seen as trying to locate it in the individual cultural subject by developing theories of a more cognitive kind. In such theories, what are at issue are *models in individual minds* of what space is like: models that condition and guide reaction to and behaviour in space. If territoriality is a theory of fundamental similarity, these cognitive theories tend to be theories of cultural, or even individual difference. The cognitive approach is less ambitious theoretically, of course, because it does not aim to provide a universal theory of space; rather it is concerned to provide a methodology of investigating differences. Studies along these lines are therefore extremely valuable in providing data on differences in the ways in which individuals, and perhaps groups, cognise their environment, but they do so on the whole in response to an environment that is already given. The order that is being sought lies in the mind and not in the physical environment itself, and certainly not in the social structuring of the physical environment. Cognitive studies provide us, therefore, with a useful method, but not with a theoretical starting point for an enquiry into the *social logic of space* itself.

Other approaches to the problem are distinguishable as being concerned initially with the environment as an object rather than with the human subject, in the sense that the focus of research shifts to the problem of describing the physical environment, and its differences and similarities from one place or time to another, as a prelude to an understanding of how this relates to patterns of

use and social activity. Of particular interest here is the work centred around the Massachusetts Institute of Technology and published in a recent volume, which brings together a range of studies with the central thematic aim of going beyond the more traditional classification approaches of geographers to urban morphology into an analysis of how differences in the organisation of architectural and urban space relate to and influence social life.⁷ Once again this work has substantial relevance to the present work, but does not provide its starting point, since there is a fundamental difference in how the problem is conceptualised. The general aim of the MIT work is to describe environments and then relate them to use, whereas we conceive the problem as being that of first describing how environments acquire their form and order as a result of a social process. Our initial aim has been to show how order in space originates in social life, and therefore to pinpoint the ways in which society already pervades those patterns of space that need to be described and analysed. Only when this is understood is it possible to make a theoretical link to patterns of use.

Counterpointing the approach to an objective environment, in itself devoid of social content, is the approach of the architectural and urban semiologists who aim to describe the environment solely in terms of its power to operate as a system of signs and symbols. By developing models largely out of natural language studies, the object of these researches is to show how the physical environment can express social meanings by acting as a system of signs in much the same sort of way as natural language. In this sense, it is the study of the systematics of appearances. There is no doubt, of course, that buildings do express social meaning through their appearances, though no one has yet shown the degree to which we can expect this to be systematic. However, the reason that this line of work cannot provide our starting point is more fundamental: the semiologists for the most part are attempting to show how buildings represent society as signs and symbols, not how they help to constitute it through the way in which the configurations of buildings organise space. They are in effect dealing with social meaning as something which is added to the surface appearance of an object, rather than something that structures its very form; and in this sense the building is being treated as though it were no different from other artefacts. The semiologists do not in general try to deal with the special problems that buildings present in understanding their relation to society: they try to fit architecture into the general field of artefact semiotics.

In spite of considerable divergences, these approaches all seem to sidestep the central problem of buildings in the sense that we have described it: they do not first conceptualise buildings as carrying social determination through their very form as objects.

In fact, they characteristically proceed by separating out the problem in two ways: they separate out the problem of meaning from the intrinsic material nature of the artefact, that is, they treat it as an ordinary artefact rather than as a building; and they separate out a human subject from an environmental object and identify the problem as one of understanding a relation between human beings and their built environment. The effect of both shifts is the same. They move us from a problem definition in which a building is an object whose spatial form is a form of social ordering (with the implication that social ordering already has in itself a certain spatial logic to it), into one in which the physical environment has no social content and society has no spatial content, the former being reduced to mere inert material, the latter to mere abstraction. This we call the man–environment paradigm.⁸

An impossible problem is thus set up, one strongly reminiscent of the most ancient of the misconceived paradoxes of epistemology, that of finding a relation between abstract immaterial ‘subjects’ and a material world of ‘objects’. By the assumption that what is to be sought is a relation between the ‘social’ subject (whether individual or group) and the ‘spatial’ object acting as distinct entities, space is desocialised at the same time as society is despatialised. This misrepresents the problem at a very deep level, since it makes unavailable the most fundamental fact of space: that through its ordering of space the man-made physical world is already a social behaviour. It constitutes (not merely represents) a form of order in itself: one which is created for social purposes, whether by design or accumulatively, and through which society is both constrained and recognisable. It must be the first task of theory to describe space as such a system.

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In view of the twin emphasis on spatial order and its social origins in defining the problem, it may come as a surprise that some early steps in formulating the present theoretical approach came from a purely formalistic consideration of randomness and its relation to form: or more precisely from some simple experiments in how restrictions on a random process of aggregating cells could lead to well-defined global patterns that bore some resemblance to patterns found in real buildings and settlements. For example, if an initial square cell is placed on a surface, then further squares of the same size are randomly aggregated by joining one full side of each onto a side already in the system, preserving one other side free (so that the cell could be entered from outside) and disallowing corner joins (as unrealistic – buildings are not joined by their corners), then the result will be the type of ‘courtyard complex’ shown in Fig. 2, with some courtyards larger than others. By

varying the joining rules, other types of pattern would follow, in each case with a well-defined global form (that of a kind of net with unequal holes) following from the purely local rule (in the sense that the rule only specified how one object should join onto another) applied to the aggregation procedure. The differences between these patterns seemed to be architecturally interesting in that some key differences between real spatial patterns appeared to be captured. More suprisingly, we discovered a settlement form that appeared to have exactly the global properties of the original experiment (Fig. 3).⁹ This suggested to us that it might be interesting to try to see how far real global settlement forms might be generated from local rules. Having started on this path, we later realised that the courtyard complex form would not be tidily generated if one specified at the time of placing the cell which other side its entrance was to be on. It required this to be left open. In other words, our first experiment turned out to be unlikelike! Fortunately, by the time this was realised, we had some much more interesting results.

For a long time, we had been puzzled by the 'urban hamlets' of the Vaucluse region of France. Each hamlet seemed to have the same global form, in that each was organised around an irregular 'ring-street' (see Figs 6 and 8(a)–(d)) but at the same time the great variations in the way in which this was realized suggested that this had arisen not by conscious design but by some accumulative process. It turned out that these 'beady ring' forms – so-called because the wide and narrow spaces of the ring street seemed like beads on a string – could be generated from a process rather similar to the courtyard complex, by simply attaching a piece of open space to the entrance side of each cell, then aggregating with a rule that joined these open spaces one to another while randomising all other relations (see pp. 59–61 for a full description of this process). By varying the joining rules once again, other variations resulted, many of which appeared to duplicate variations found in this type of settlement form in different parts of the world.

There were several reasons why this seemed a promising development. First, it seemed that real problems in settlement generation might sometimes be solved through the notion of local rules leading to well-defined global forms. It raised the possibility that other settlement forms might be understood as the global product of different local rules. Second, and more important, it seemed that the nature of the process we had identified could be theoretically significant, in that structure had by implication been conceptualised in terms of restrictions on an otherwise random process. This meant that in principle it was possible to conceive of a model which included both non-order and order in its basic axioms. In effect, randomness was playing a part in the generation of form, and this seemed to capture an important aspect of how