Chapter five

Can architecture cause social malaise?

Architectural determinism as a mind-body problem

There is a widespread belief that architecture can cause social malaise, either by directly bringing about anti-social behaviour, or by inducing stress and depression in individuals, or by creating vulnerability to crime.[1] In fact, little is known about these effects. We cannot even be sure if any of them genuinely exist. The long-term and large-scale studies that would be necessary to settle the questions have not been done. As a result, although these effects are widely believed in, they are equally widely discounted as incredible, either on common sense grounds – how could building possibly have such far-reaching effect on people's minds – or methodological grounds – how can the vast variety of factors that can affect social malaise be sorted out one from the other when they are all so inextricably bound up together in the lives of the alleged victims of bad design.

From a research point of view, there are good grounds for scepticism, at least on the basis of current evidence. There is a problem of method in establishing any kind of link between architecture and social outcomes, which studies have not usually convincingly broached. Housing is invariably a social process as well as a physical product. Both markets and bureaucracies assign poor people to poor housing, making bad housing a dependent variable in a process of social disadvantagement. How then can we ever hope to extract any effects there may be from architecture as an independent variable, when the social process in which architecture is embedded is already likely to be operating with architecture as a dependent variable? In short, if we do find bad design associated with social disadvantagement, how can we ever be sure that the former is determining – or even contributing to – the latter, when the broader social process is likely already to have brought about the association of both? Since all we can study are real cases, and every estate or housing area selected for study will already be a continuing social process, it is not clear how this difficulty can ever be circumvented.

If this were not enough, there is a second difficulty, no less fundamental, but theoretical – even philosophical – rather than methodological. Building is the creation of a physical and spatial milieu. If we are to believe that this physical milieu can somehow invade people's minds and have effects that are strong and systematic enough to influence behaviour, then we must have some conception of a plausible chain of sensorial or mental events through which this could come about. There are no credible models for such mechanisms. Even for individuals, it is hard to conceive of a process by which such effects could occur. The idea that they can be extended to the level of whole communities, is frankly incredible.

In fact, the very idea of 'architectural determinism' – that buildings can have systematic effects on human behaviour, individually or collectively – seems to lead directly into the quagmire of mind-body problems which have plagued philosophy for centuries. Whether we conceptualise minds as immaterial entities or as physical brain states, it is equally difficult to see how physical objects like buildings could affect minds in such as way as to produce durable and systematic behavioural effects. Without some conception of how such chains of events might come about,

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it is difficult to see how research can proceed.

The two difficulties taken together – the methodological and the theoretical – combine to make architectural determinism a surprisingly deep and complex issue. However, it is hard to see how it can be avoided. To argue in principle against any kind of architectural determinism, that is, any kind of positive or negative effects of architecture, leads to the odd proposition that it does not matter at all how environments are designed, since they are behaviourally neutral. This proposition seems even less credible than architectural determinism. We are, it seems, caught between two contrary and mutually exclusive possibilities, each of which seems as unlikely as the other. As a result, architectural determinism seems more paradoxical than problematic, in the sense that these rather abstruse difficulties stand in the way of a clear problem identification that would allow research to proceed.

Fortunately, when human thought finds itself in such situations, there is always a simple third possibility: that the problem has been set up in the wrong way. It is through this third possibility that both of these apparent difficulties will be addressed in this chapter. There are, it will be argued, perfectly credible mechanisms by which architecture can get into heads and come out as individual behaviour and equally credible mechanisms for generalising these to effects on communities. Moreover, in setting these mechanisms out with care, we can also show how the effects of architecture can be extricated from those of the social disadvantagement process. In other words, the methodological and theoretical problems can be solved together because they stand or fall together. The two can be reformulated, and converted from a form in which neither can be solved into one in which both are, if not obviously solvable, then at least tractable to systematic enquiry.

A careful look at methodology

The argument begins with methodology. We must first be a little clearer about the methodological difficulties that studies of the effects of architecture on people have always encountered. Strangely, perhaps, the key difficulty has not so much been one of investigating what goes on in human minds. Architectural and social psychologists have generally been quite adept at this. The difficulty has been one of controlling the architectural variable, that is, of arriving at descriptions of the differences between one built environment and another that are sufficiently precise and consistent to permit correlation with attitudinal or behavioural variables. Most studies have sought to solve this problem by physical descriptors at a the gross level of the estate or block – size of estate, numbers of stories per block, number of entrances, existence of walkways, and so on. Unfortunately, it is exactly at this gross level that the social process of disadvantagement is likely to be most active. The only level at which it might be be expected to be less active would be at the much smaller scale of the different types of location within the estate – this section of walkway, this cul-de-sac, this courtyard, and so on. However, the type of descriptors that have been used do not easily permit such disaggregation in a systematic way. It is partly as a result of the failure to control the architectural

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variable with sufficient precision that many suggestive results apparently linking architecture to social disadvantagement, are challenged. The gross level at which the architectural variables are handled makes it easy – and proper – to argue that studies have failed to distinguish architectural effects from social process effects convincingly, because it is exactly at this gross level that the social processes are most manifest and easiest to point to.[2]

This problem can be solved, if at all, only by treating both the architectural and social variables at a much finer level of resolution, so that the units of analysis are, at most, small groups of households – we can call them location groups – which are sufficiently large so that individual variation is not dominant, but not so large that social process differences between one location group and another are likely to be dominant. If it is the case that bureaucratic allocation processes and market forces alike tend to work most virulently at the grosser levels of the bad area; the notorious estate, or the unpopular block, then we may reasonably expect them to be much less obtrusive at the level of the numerous small groups of households which will be found on every estate or in every area.

It is exactly this finer level of resolution of both architectural and social data that can be achieved and made systematic by using configurational modelling of space, as the basic means for controlling the architectural variable. This allows parametric descriptors of spaces to be assigned at whatever level of resolution we choose. We have already seen that configurational properties of spaces are crucial to the ways in which space 'works' at the level of patterns of movement, and the knock-on effects these have over time on other aspects of urban form which are sensitive to movement, such as the distribution of certain types of land use, such as retail, and some types of crime, as well as the fear of crime. In the studies shown in Chapter 4, the ability to control the architectural variable parametrically through spatial modelling allowed us to distinguish the effects of spatial configurations on behavioural variables such as movement rates from other possible explanations of the same phenomena. It was simply a matter of doing the analysis carefully.

Architecture and the virtual community

From the point of view of our present interest in social malaise, however, the regularities between space and movement that we have noted are at a rather 'low level', in the sense that although they are clearly 'system effects' from architectural design to patterns of behaviour amongst collections of people, it is not clear that they have implications for the forming of communities, which are 'high level' in the sense that they involve more or less complex structures of interactions and relationships amongst collections of people. However, in the previous chapter we were able to look outwards from these low-level system effects and find that they were related to many other key features of urban structure, such as the evolution of the urban grid, land use distributions and building densities. In other words, at the level of the city as a complex physical and spatial structure we were able to find a way from low-level regularities linking space and movement to some quite high-level

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effects on the structure and functioning of the city as a whole.

In what follows, the argument will be taken in the contrary direction, and we will look for the possible implications of these low-level system effects on the microstructure of the urban spatial environment, that is, the immediate spatial milieu in which many people live out much of their everyday lives. The basis of the argument is simple. Spatial configuration influences patterns of movement in space, and movement is by far the dominant form of space use. Through its effects on movement, spatial configuration tends naturally to define certain patterns of co-presence and therefore co-awareness amongst the individuals living in and passing through an area. Co-present individuals may not know each other, or even acknowledge each other, but it will be argued that this does not mean to say that co-presence is not a social fact and a social resource. Co-present people are not a community, but they are part of the raw material for community, which may in due course become activated, and can be activated if it becomes necessary. However, even without conversion into interaction, patterns of co-presence are a psychological resource, precisely because co-presence is the primitive form of our awareness of others. Patterns of co-presence and co-awareness are the distinctive product of spatial design, and constitute, it will be argued, the prime constituents of what will be call the 'virtual community'. The 'virtual community' in a given area is no more nor less than the pattern of natural co-presence brought about through the influence of spatial design on movement and other related aspects of space use.

Because virtual communities are no more than physical distributions of people in space, careful observation can tell us a great deal about them. First, virtual communities have certain obvious properties such as density, but also less obvious properties such as a certain structure, that is, a certain pattern of co-presence between people of different categories and using space for different purposes; for example inhabitants and strangers, men and women, adults and children, and so on. Second, it is easy to establish that the density and structure of virtual communities is observably quite different in most housing estates compared with street-based urban areas, and seems to become more so in quite systematic ways as housing estates become 'worse'. Third, there seem to be clear associations between the nature of virtual communities in different types of environment and key outcome variables: how much vandalism and where it occurs, where crimes occur, where anti-social uses of space develop, and so on.

Through its low-level effects on patterns of movement, it will be argued that there are also high-level implications for space at the micro-level which come about through the creation – or elimination – by spatial design of the patterns of natural co-presence and co-awareness of individuals that make up virtual communities. Whatever the long-term effects of architecture are, it will be proposed that they pass through this central fact, that architecture, through the design of space, creates a virtual community with a certain structure and a certain density. This is what architecture does and can be seen to do, and it may be all that architecture does. If space is designed wrongly, then natural patterns of social co-presence in space are

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not achieved. In such circumstances, space is at best empty, at worst abused and a source of fear. If too much space in the local milieu is like this, everyday experience of others is an experience of a disordered 'virtual community'. It is this that links architecture to social malaise. The intervening variables between architecture and behaviour are, in effect, the design of space and the consequent use of space.

In this chapter it will be argued that through configurational analysis of space, coupled to careful observation of the use of space, we can isolate certain suggestive regularities in the structure of virtual communities, and show that these differences are the outcome of differences in the architectural design of space. Co-presence and co-awareness are therefore the the key operation concepts, and the virtual community the key theoretical concept. These differences, it will be argued, are both systematic effects of the design of spatial configuration, and also far more important to the long-term development of the spatial community than has hitherto been realised, not least because social scientists have normally seen social interaction as the elementary social unit, and co-presence as merely prior to social interaction. However, the pattern of co-presence does result largely from design and its analysis therefore offers the most promising path from architecture to its social effects.

The formula for urban safety

We may begin by considering the results in the last chapter a little more carefully from the point of view of the micro-structures of local space. From hourly rates of pedestrian movement in the area shown in the study of Barnsbury in Chapter 4, we can work out the rates of movement per minute, which is about the time it takes to walk 100 metres at normal speed. We can then take the average line length, and work out the probabilities of co-presence in space for individuals moving around the area. The comparatively long average length of lines, coupled with the fact that the average movement rate is around 2.6 adults per minute in this area, means that on average an individual will be in visual contact with at least one other person more or less constantly. In fact, for most of the time, a walking individual is likely to be in visual contact with more than one other person. The merits of this combination of numbers and length of lines of sight are obvious. It provides the moving individual not only with the security of more or less constant visual contact with more than one other person, but also with sufficient warning of encounter to take evasive action if necessary. The interface with others is both dense and to some extent controllable by the individual.

Now consider the parallel situation in one of the nearby housing estates shown in Chapter 4. Here the mean encounter rate in the estate interior is .272, an order of magnitude less than in the street area, even though the streets surrounding the estate approximate the rates in the street area. It is also the case that the mean length of sightlines within the estate is a great deal shorter than in the street area. From these two pieces of information we may easily calculate that an individual walking in the interior of the estate will be on their own for most of the time. The sparsity of encounters, coupled with the shortness of sightline, also means that

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most encounters, when they occur, will be relatively sudden, with little time to evaluate the coming encounter and take appropriate action.

In these conditions, individual behaviour changes. We may illustrate this with a thought experiment. Imagine an individual, X, living in an ordinary street. It is midday. X comes out of his or her front door. A stranger is about to pass by the door. Another is slightly farther away, but will also pass the door shortly. A third is passing in the opposite direction on the other side of the road. In these circumstances, the presence of strangers seems natural. X even finds it reassuring. Certainly X does not approach the person passing the door and ask what he or she is doing here. If X did this, others would think X's behaviour odd, even threatening. Unless there were special circumstances, someone might even send for the police if X persisted.

Now consider Y, who lives on a short upper-level walkway remote from the public street within a housing estate. Like X, Y comes out of his or her front door, and looks down the walkway. Suddenly a stranger appears round the corner in exactly the same position relative to Y's doorway as in the previous case the stranger was to X's. Due to the local structure of the space, of course, it is very likely that no one else is present. Unlike X, Y is nervous, and probably does one of two things: either he or she goes back inside the house, if that is easiest, or if not asks the stranger if he or she lost. The encounter is tense. Both parties are nervous. Y is being 'territorial', defending local space, and the stranger is being asked for his or her credentials.

Now the curious thing is that in the prevailing spatial circumstances, Y's behaviour, which, if it had occurred on the street, would have seemed bizarre, seems normal, even virtuous. In different environmental conditions, it seems, not only do we find different behaviours, but different legitimations of behaviour. What is expected in one circumstance is read as bizarre in another. So what exactly has changed? There seem to be two possibilities. First, the overall characteristics of the spatial configuration – not the immediate space which is more or less the same – of which the space Y was in is a part has changed, compared with X's. Second, Y's expectation of the presence of people has changed.

These two changes are strictly related to each other. Changes in configuration produce, quite systematically, different natural patterns of presence and co-presence of people. People know this and make inferences about people from the configuration of the environment. An environment's configuration therefore creates a pattern of normal expectation about people. These expectations guide our behaviour. Where they are violated, we are uncomfortable, and behave accordingly. What is environmentally normal in one circumstance is unexpected in another. This is both an objective fact of environmental functioning, and a subjective fact of 'description retrieval',[3] that is, of the mental processes by which we read objective circumstances and make inferences from them.

The behavioural difference we have noted is therefore environmentally induced, not directly, but via the relation between configurational facts and configurational expectations. One effect of this is that it can induce environmental fear, often to a greater degree than is justified by the facts of crime, because

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Figure 5.1a
Figure ground of space of the housing estate.

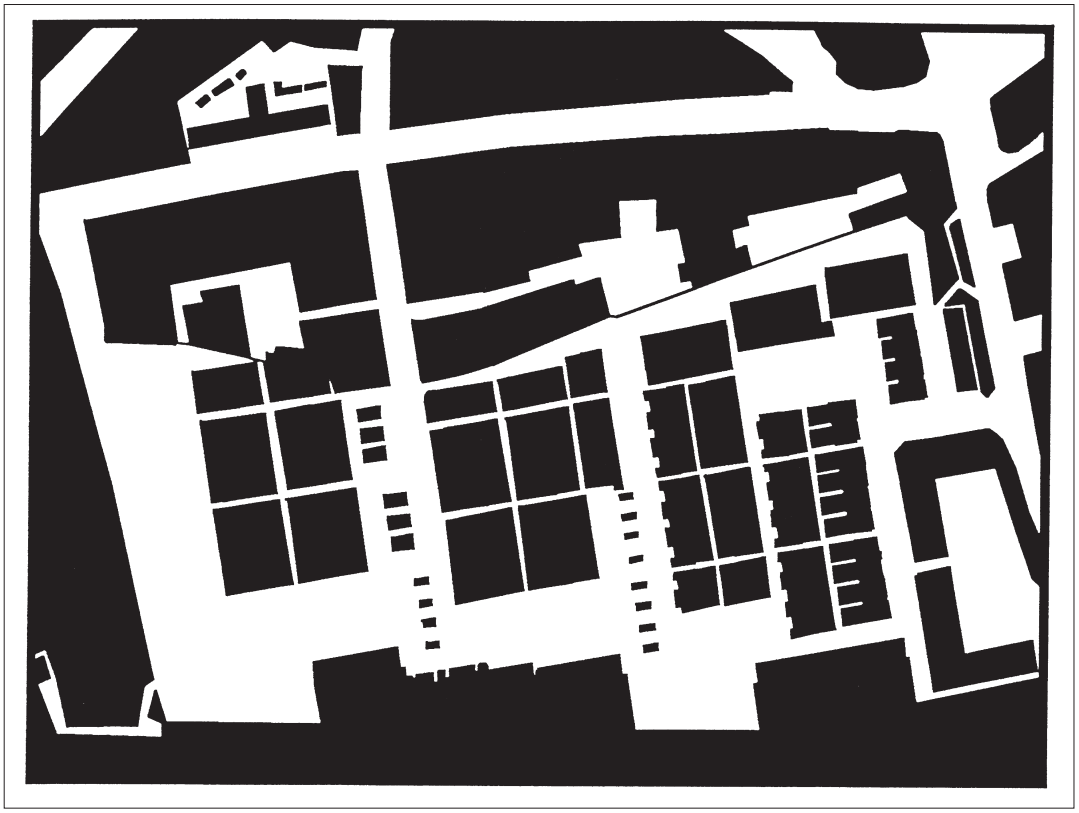

Figure 5.1b
Global integration of housing estate within its urban context.

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Figure 5.1c

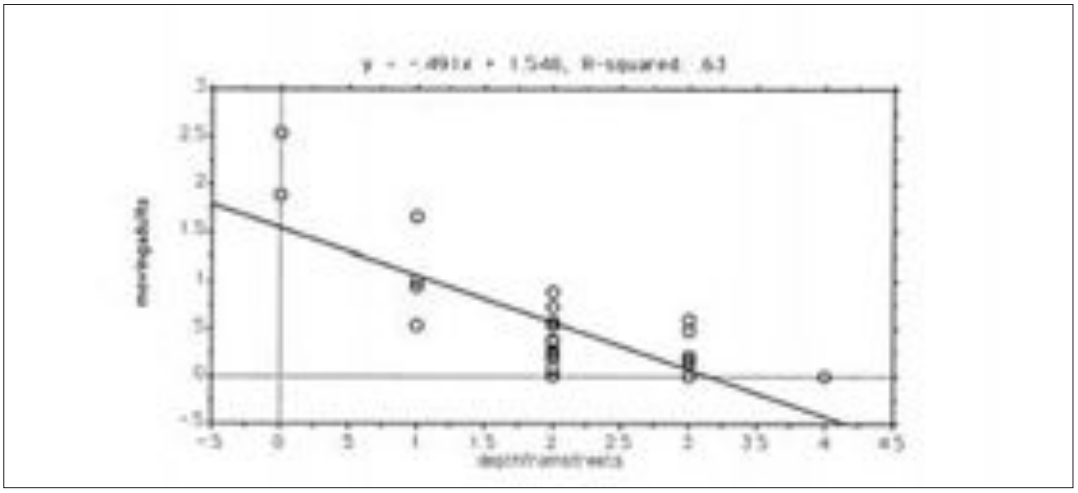
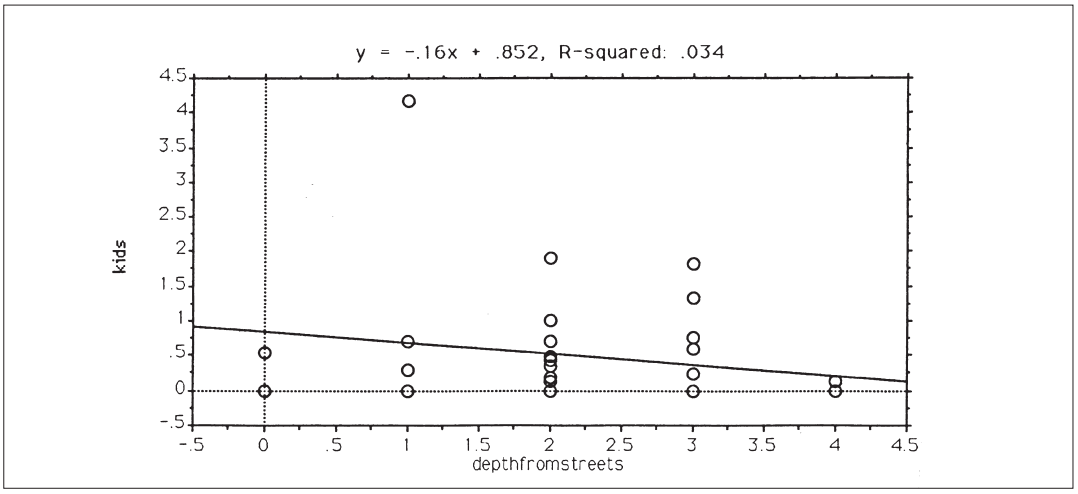


Figure 5.1d



it takes the form of an inference from environment rather than from an actual presence of people. It is these inferences from the structure of space to the pattern of probable co-presence that influences behaviour and are also responsible for the high levels of fear that prevail in many housing estates. This is the fundamental reason that the urban normality of street-based systems usually seems relatively safer than most housing estates.

Let us then reflect on how the reduction of the mean encounter rate by an order of magnitude in the housing estate when compared with the street-based system actually occurs. Figure 5.1a shows a black on white of the space of the housing estate in question within its urban context, and figure 5.1b shows its global integration into its urban context. There are two aspects to the answer. The first is that the complexity and down-scaling of the spatial design of the estate ensures that natural movement is virtually eliminated. The simplest way to show this is simply to correlate movement with axial depth from the outside into the estate. Figure 5.1c is the scattergram.[4] This fall off of movement from the edge of the estate towards the interior is common to the majority of housing estates, most of which down-scale and destructure estate space in a similar way. It is noteworthy that in

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this case, as in other cases, the movement pattern directly reflects the layered local spatial system shown in figure 4.8 in Chapter 4.

The second reason has to do with the number and distribution of dwelling entrances. In this estate, as in most others, entrances only occur on certain lines, and most of these are relatively deep from the outside. Each line will have perhaps ten or twelve dwellings opening onto it, and it will be connected to the outside not by other lines with dwellings opening onto them, but in general by lines without dwellings. In other words, even lines with dwellings will only have the movement on them generated by the dwellings themselves. Suppose there are two adults per dwelling and each makes, say, to be generous, four movements a day. This means less than ten per hour, or about one every five minutes – that is, the observed encounter rate. Since the residential lines are relatively short, the probability of encounter on any trip on that line will be no more than ten per cent. In other words, the encounter rates on the estate, with all their implication for the generation of fear and nervous behaviours, are implicit in the design.

We can now see that the formula for urban safety must depend, for simple numerical reasons, on the presence of strangers as well as inhabitants, and is therefore a little more complex than 'defensible space'. We need to replace a static conception of space by a movement-based one. The main idea behind defensible space was that inhabitants who were static and in their dwellings had to be put into a position, by design, to have natural surveillance of the spaces leading to their doors in order to see and deter potential wrongdoers, who were strangers and moving. Our results suggest that what really happens is that the natural movement of moving strangers maintains natural surveillance on space, while the static inhabitants, through their dwelling entrances and windows, maintain natural surveillance of moving strangers. This formula clearly depends on the spatial configuration creating a strong probabilistic interface between inhabitants and strangers. In short, it is the mix of inhabitants and strangers in space that is the source of safety. Environments will tend to lack of safety and environmental fear to the extent that they separate the two. Put more succinctly, the formula for urban safety is a certain aspect of the structure of the virtual community – that is, the pattern of probabilistic interfaces – created by spatial design.

Social structures of space and the L-shaped problem

Now the heart of my argument is that through more complex effects on virtual communities, these still rather low-level effects of space reach much further into our social lives than we realise. They can create or fail to create certain subtle and complex system effects, which are so suggestive that we might even think of them as the 'social structures' of space – though at some risk of criticism from social scientists would not think of these effects as social at all. These social structures of space are simply generalisations of the ideas we have so far developed on how space interfaces inhabitants and strangers to different categories of people, in general: men and women, adults and children, the young and the old, and so on.

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These 'multiple interfaces' in space can be objectivised by using, as before, the simple statistical technique of the scattergram, though now we will be more interested in the visual pattern of the scatter than in correlation coefficients. Figures 5.2a and 5.2b are scattergrams in which instead of setting functional against spatial parameters, we set two functional parameters against each other, in this case the movement of men against the movement of women. By checking the axes for the average degree to which each space is used by each category, we can work out the probability of co-presence in each space. The correlation co-efficient thus indexes something like a probabilistic interface between two different categories of people.

Now the point of the pair of scattergrams is that the first represents the situation in the street pattern area shown in Chapter 4, which is near the housing estate under consideration, while the second shows the situation within the housing estate. It is easy to see that the 'probabilistic interface' between men and women is much stronger in the street area than within the estate. In the street area, the linearity of the scatter shows that men and women are using space more or less in the same way, and are more or less equally likely to be co-present in all space. There are no spaces in which men are more likely to be present than women, and *vice versa*. Within the estate, the situation is quite changed. The irregularity of the scatter shows that many spaces prioritised by men are poorly used by women, and *vice versa*.

By using this simple technique to explore interfaces between different categories of people using space, we can show that ordinary urban space, even in predominately residential areas, is characterised by multiple interfaces: between inhabitant and stranger, between men and women, between old and young and between adults and children. We can be confident that these multiple interfaces are produced by spatial design, because they are essentially a product of the natural movement patterns which we have already shown are predominantly produced by the structure of the urban grid. This is such a consistent phenomenon, that it is difficult to see it as purposeless or accidental. In fact, the more we find out about how space works socially and economically, the more these multiple interface patterns seem implicated in all the good things and the loss of multiple interfaces in all the bad.

One of the most critical of these interfaces – because it may be implicated in socialisation – is that between adults and children. Figure 5.2c is the interface between moving adults and 'static' children (i.e. those who are more or less staying in the same space) in the urban areas and figure 5.2d the same for the housing estate. The scatter for the urban area is far from perfect, but it shows unambiguously that moving adults and children are present in spaces in a fairly constant ratio, with adults outnumbering children by at least five to one, and more commonly ten to one. Wherever there is a child or a group of children, there are also likely to be significantly more adults in the space. This is not deterministic, but it is a powerful enough probabilistic regularity in the system to be a fairly reliable experiential property.

Within the estate, the scatters show a dramatically different picture. The L-shaped scatter shows that adults and children are completely out of synchronisation

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Figure 5.2a
Street pattern

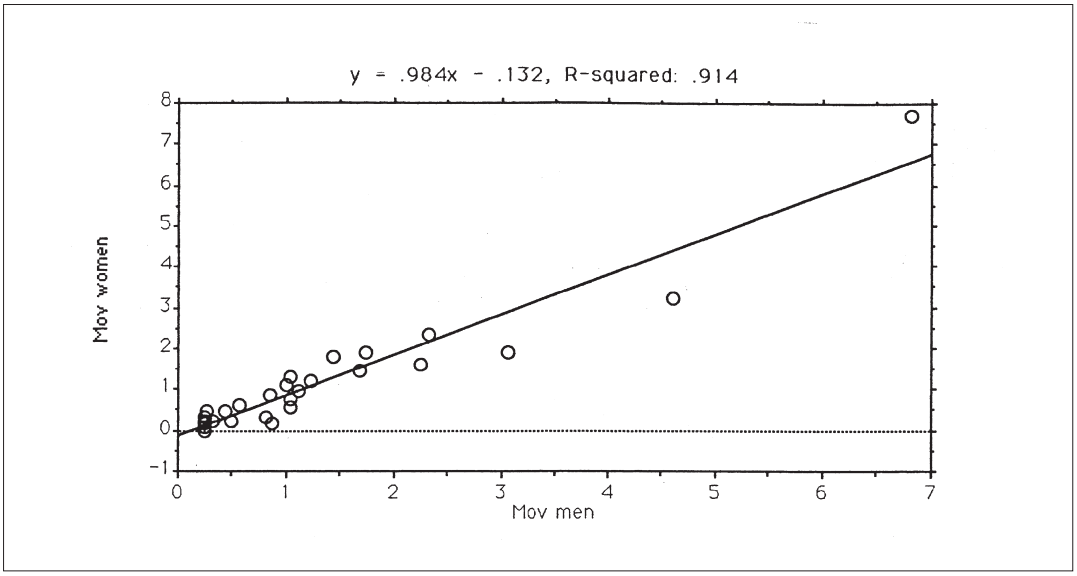
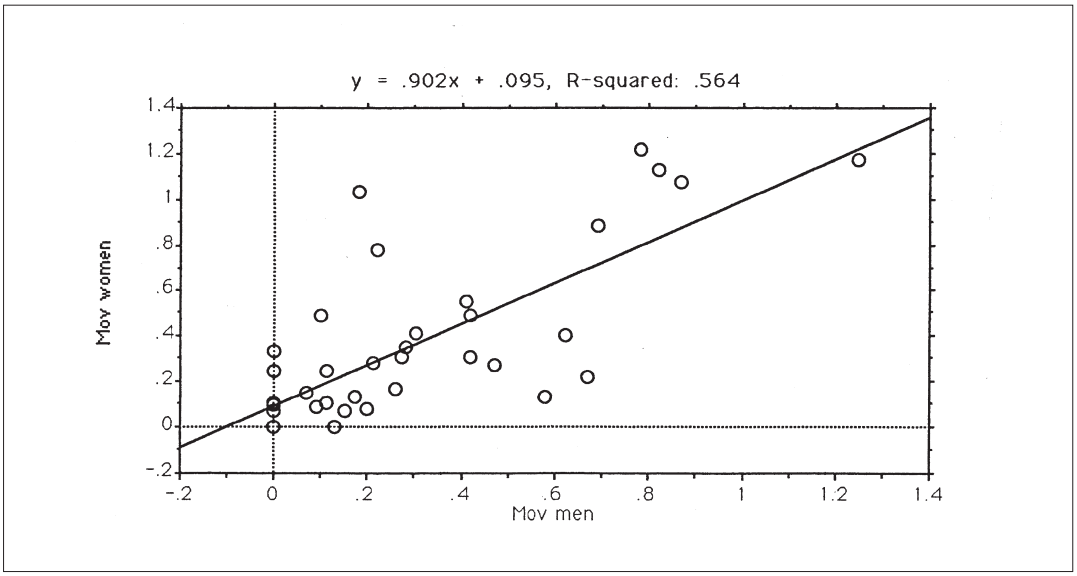


Figure 5.2b
Street pattern



with each other. This is not a random relation, but a highly structured non-relation. Spaces prioritised by adults are in general not well used by children and spaces prioritised by children are usually poorly used by adults for movement. This means that the probabilistic interface between the two categories is very poor indeed. This is why we call this the L-shaped problem. L-shaped distributions mean ruptured interfaces between different kinds of people. The more the scatter moves from a linear scatter to an L-shape, the less there is a natural probabilistic interface between those categories of people through the effects of the space pattern on everyday movement.

This effect may also be shown graphically in the plan. Figures 5.3a and 5.3b plot the presence of adults and children respectively in the plan of the housing estate by recording one dot per individual present during an average ten-minute time period during the working day – hence the name 'ten minute' maps. For adults the pattern is clear. Movement densities fall off rapidly with linear depth into the

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Figure 5.2c
Street pattern

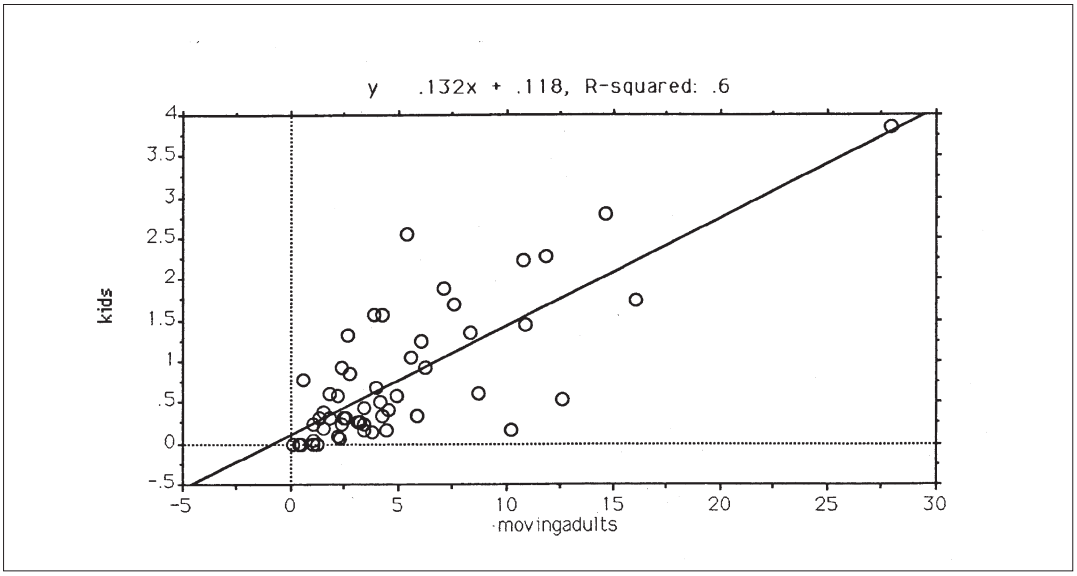
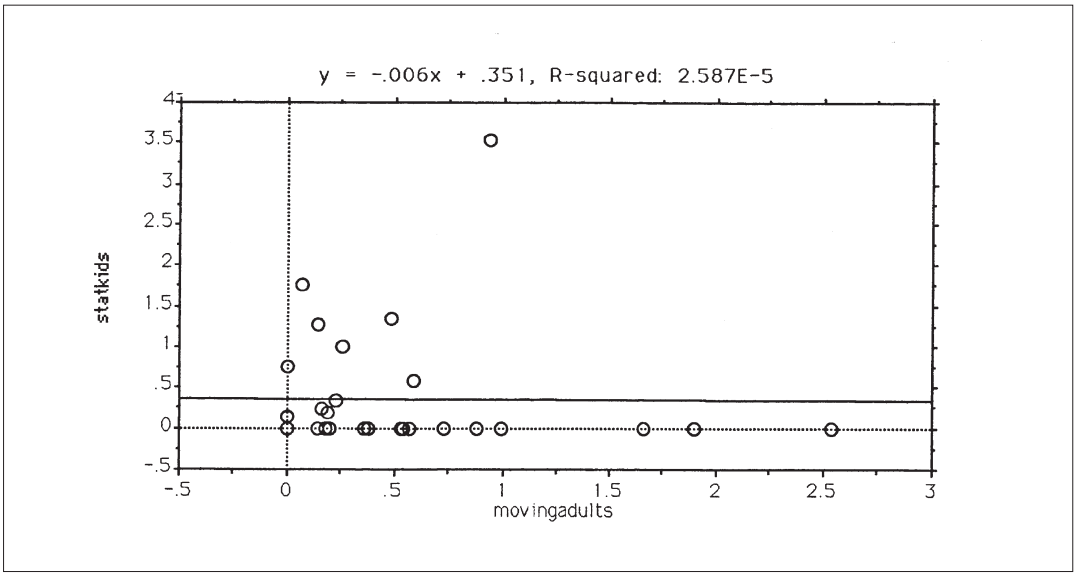


Figure 5.2d
Street pattern



estate, so that in the deepest lines towards the centre of the estate, there is very little movement indeed. In particular, the north-south lines where most dwelling entrances are located have very low rates of movement. The children's ten minute map is quite different. The main concentrations of children are in exactly the north to south lines that are so poorly used for adult movement. In fact, the younger children use the constituted (with dwelling entrances) north-south spaces off the main east-west axis, while teenagers, especially boys, use the more integrated, largely unconstituted spaces on the upper levels just off the integration core. In general, we see that children tend to occupy spaces with low adult movement one step away from the natural movement spaces (such as they are).

The pattern becomes clear if we plot the presence of children against linear depth from the outside of the estate, as in figure 5.1d. The peak is not near the edge as with adults but a good deal deeper. This can be checked numerically by first

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Figure 5.3a
A 'ten minute' map plotting numbers of adults on a route with each dot representing one adult per ten minute period.

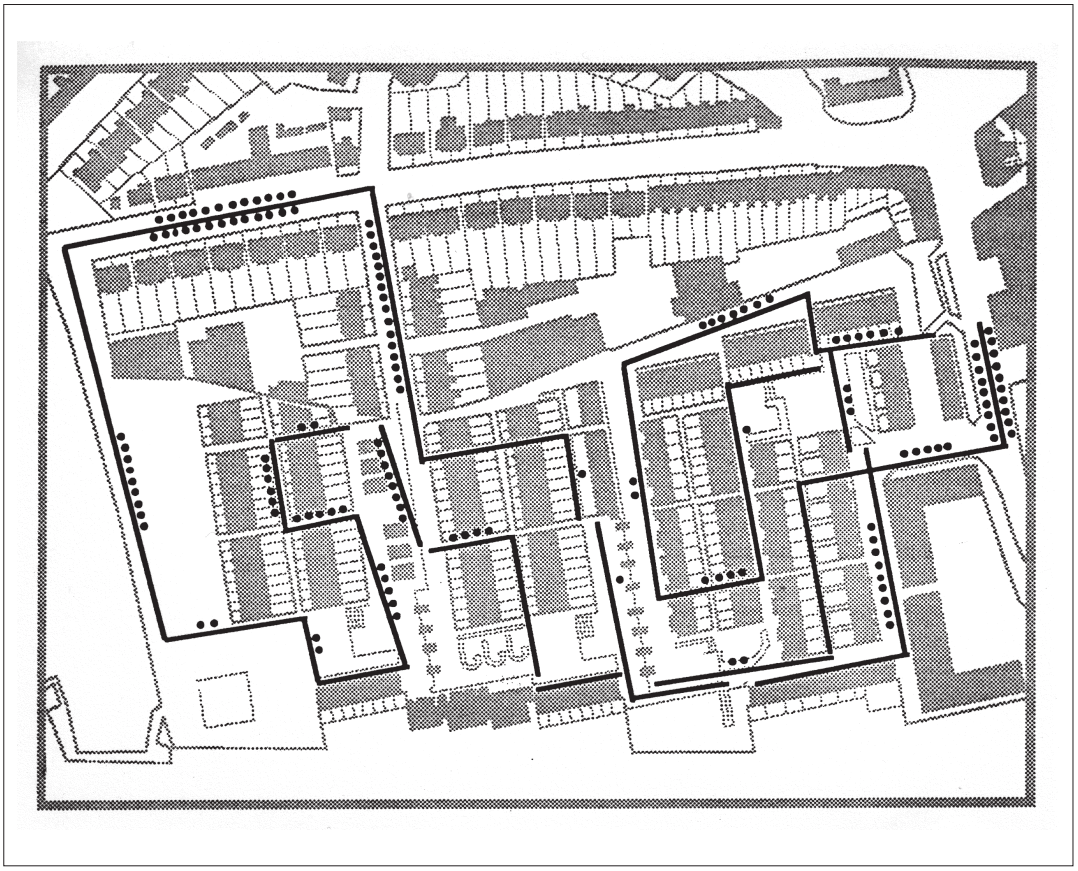
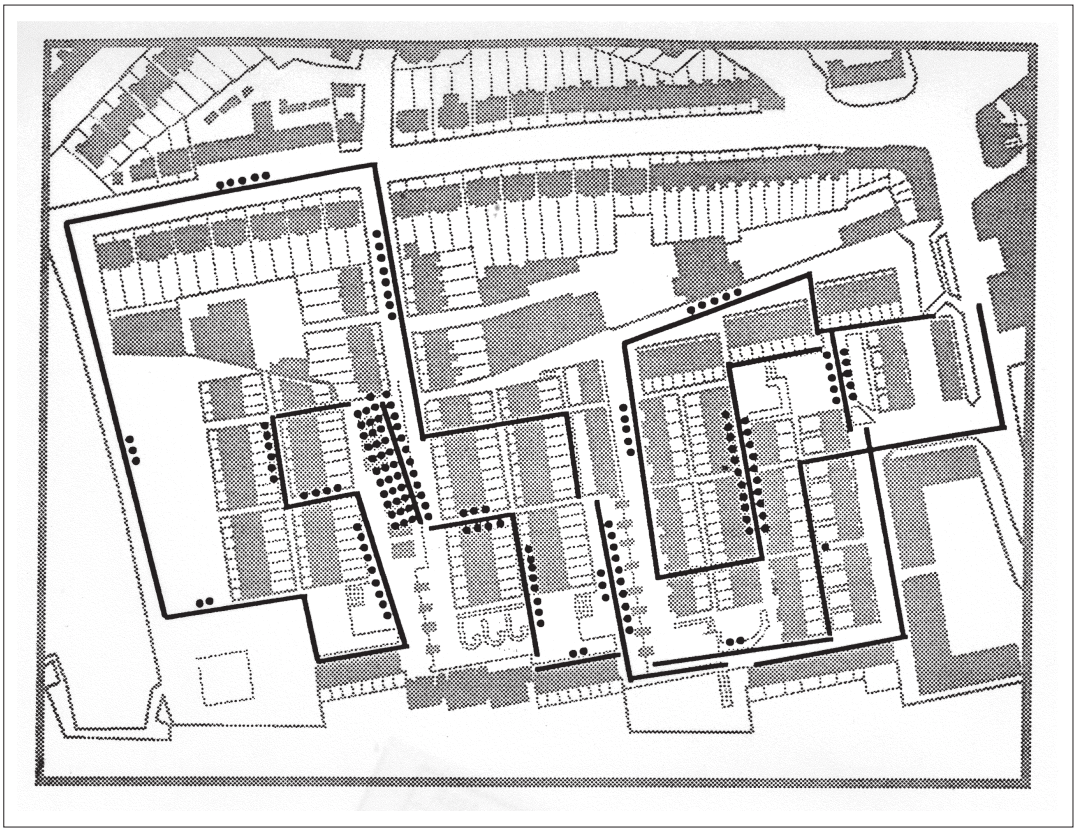


Figure 5.3b
A 'ten minute' map plotting numbers of children on a route with each dot representing one child per ten minute period.



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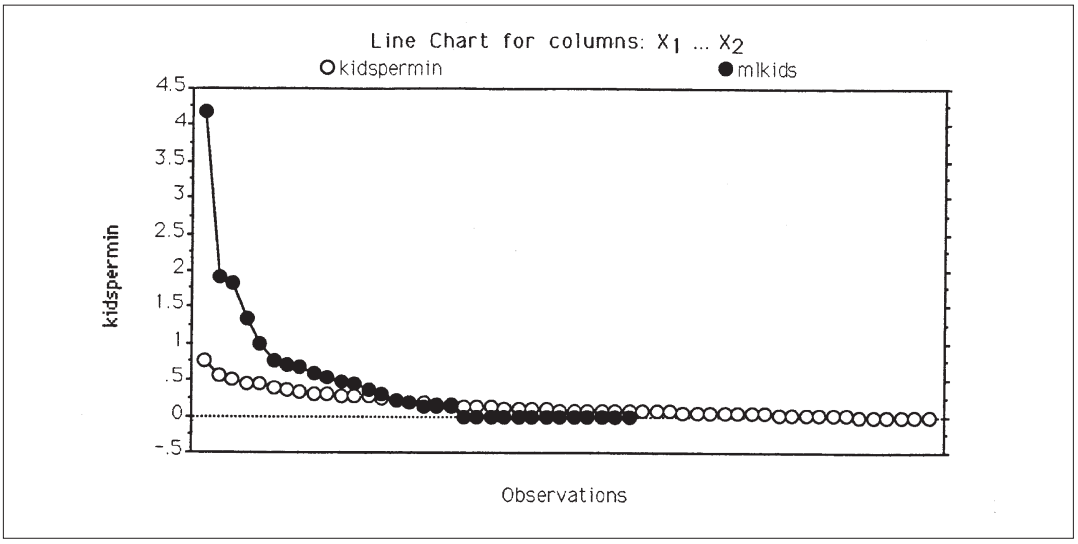
calculating the mean axial depth of adults from outside the estate, which is .563, and then children which is .953. We can then recalculate subtracting one axial step per observed child. This yields .459, which is more or less the same as for adults. In other words children are on average one step deeper than adults. Because the effect of spatial complexity on such estates is such that every axial step into the estate means greater segregation from the surrounding area as a whole this

Figure 5.4



means that children are, on average, a little less integrated than adults, but about as integrated as they could be without occupying the natural movement spaces most used by adults. They are in effect as integrated as they can be without being where adults are. This is what we sense moving about the estate. We are very aware of children, but we are not among them. Again, by checking the same distributions across housing estates, we find that this is a fairly general pattern. Children do not seek out segregated spaces. They seek out the most integrated spaces that are not used by adults for natural movement. The loss of interface between adults and children in effect depends on the availability of such spaces. In urban street systems, such spaces do not exist because all spaces are used to a greater or lesser extent for adult movement.

This is not the end of the matter. If we look at the actual counts of children in the various spaces of the urban street area and the estate then we find a very high degree of diffusion among the children in the urban area. This can be seen in figure 5.4 which plots the numbers of children found in each space from the most to the least with circles representing the pattern in the urban area, and dots for the housing estate. In the urban area, there are no significant concentrations, and very few spaces are without children altogether. Numerically, there are no spaces without adults and only 11 per cent of spaces without children. In the housing estate, in contrast, children are much more concentrated. 41 per cent of the spaces have no children and the much higher overall average number of children are concentrated

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in a very much smaller proportion of the spaces, with some very large peaks, so much so that some spaces are dominated by children or teenagers. As we have seen, these spaces are lacunas in the movement system for smaller children and lacunas in the movement and related-to-entrances system for older kids. In other words, we can see clearly that children on the estate spend more time away from adults and in larger groups in spaces which they control by occupying them unchallenged. We might describe such a process as emergent, or probabilistic, territorialisation, and note that it is a system effect; the outcome of a pattern of space use, rather than the product of a hypothetical inner drive in individuals. At present, we can only speculate on the effects of these spatial regularities on the long-term socialisation of children into the adult world. At this stage, we can only note that children spend longer times in larger groups, well away from natural surveillance by adults. Not surprisingly perhaps these patterns have also been correlated with patterns of petty crime and vandalism.[5]

More worryingly, observations of other 'interfaces', admittedly less rigorous than the one reported above, have suggested that other, more obviously anti-social uses of space also follow similar patterns, in that these uses tend to concentrate not on the most integrated lines of natural movement, nor on the most segregated lines, but on the most integrated lines available that are not dominated by natural movement. Anti-social uses of space seem to seek out the most integrated spaces available after those taken up by natural movement.

Other estates

What is clear is the generality of the loss of interfaces and the relation of this to the degree of integration of an estate. These findings are due to the work of a doctoral student in the Bartlett, Xu Jianming. He studied ten housing estates, including the one above, selected to cover a range of morphological types and historical periods since the second world war. He divides his types in to three main historical phases. His early period covers the typical mixed high- and low-rise estates of the early modern post-war period, his second the 'streets in the air' phase, when designers, following the criticism of early modern solutions by Team 10 and others, sought to recreate above the ground the space and space use types characteristic of traditional streets, and his third the neo-vernacular phase, when designers retreated from above-ground solutions and tried to recreate traditional space at ground level, though usually with over-complex, labyrinthian designs imitating imaginary small town and village space types.

The full range of this still incomplete study will not be reviewed here. However, as part of his research Xu observed space use and movement patterns, and plotted scattergrams of interfaces between all major constituencies of space users. The results are quite remarkable, from two points of view. First, the L-shaped scatter for the moving adults to static children relation is highly general, though occurring to a different degree, as shown in the series of scatters for the ground level of estates in figure 5.5. Second, the degree to which the L-shaped scatter is present, as indicated

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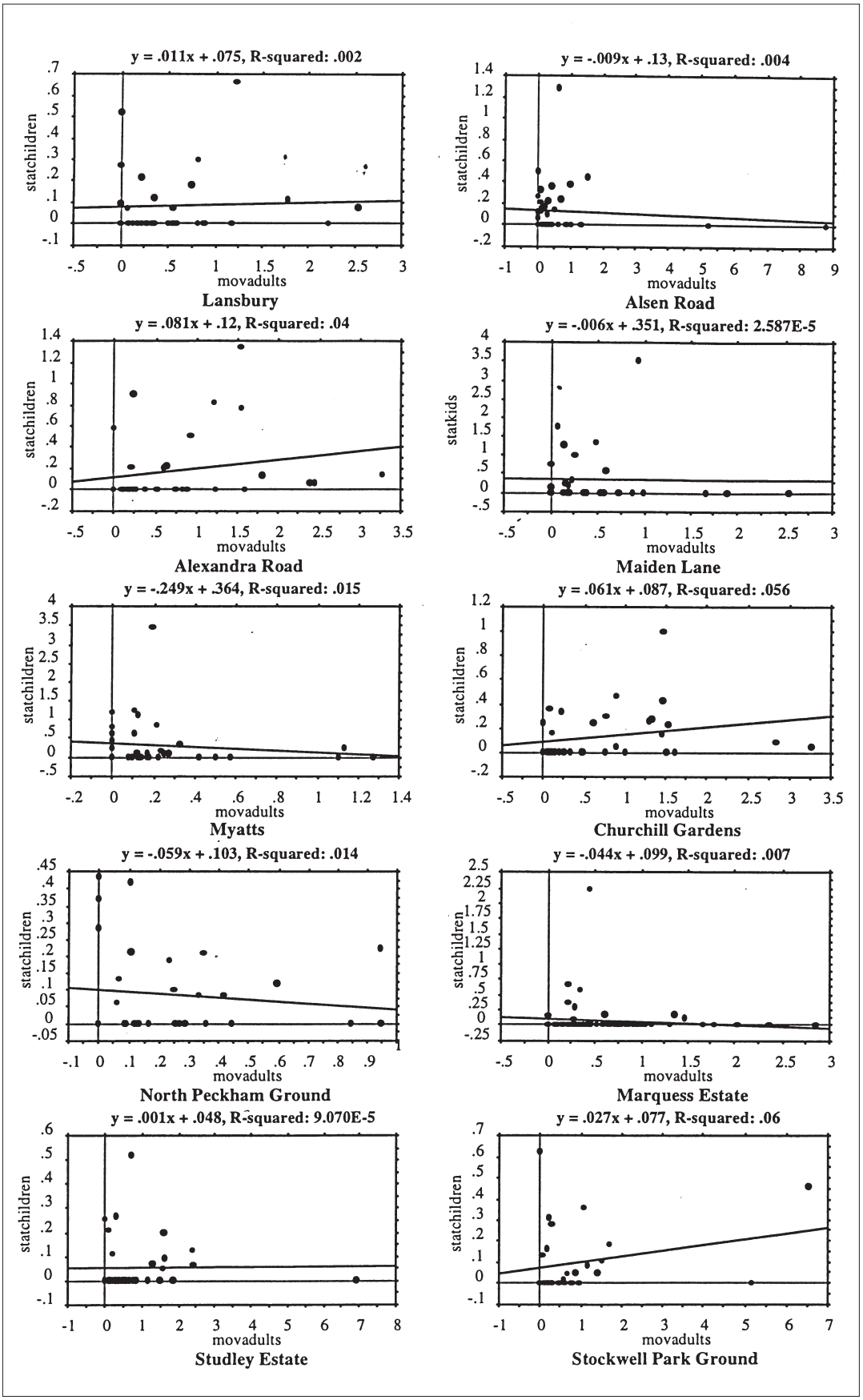
Figure 5.5



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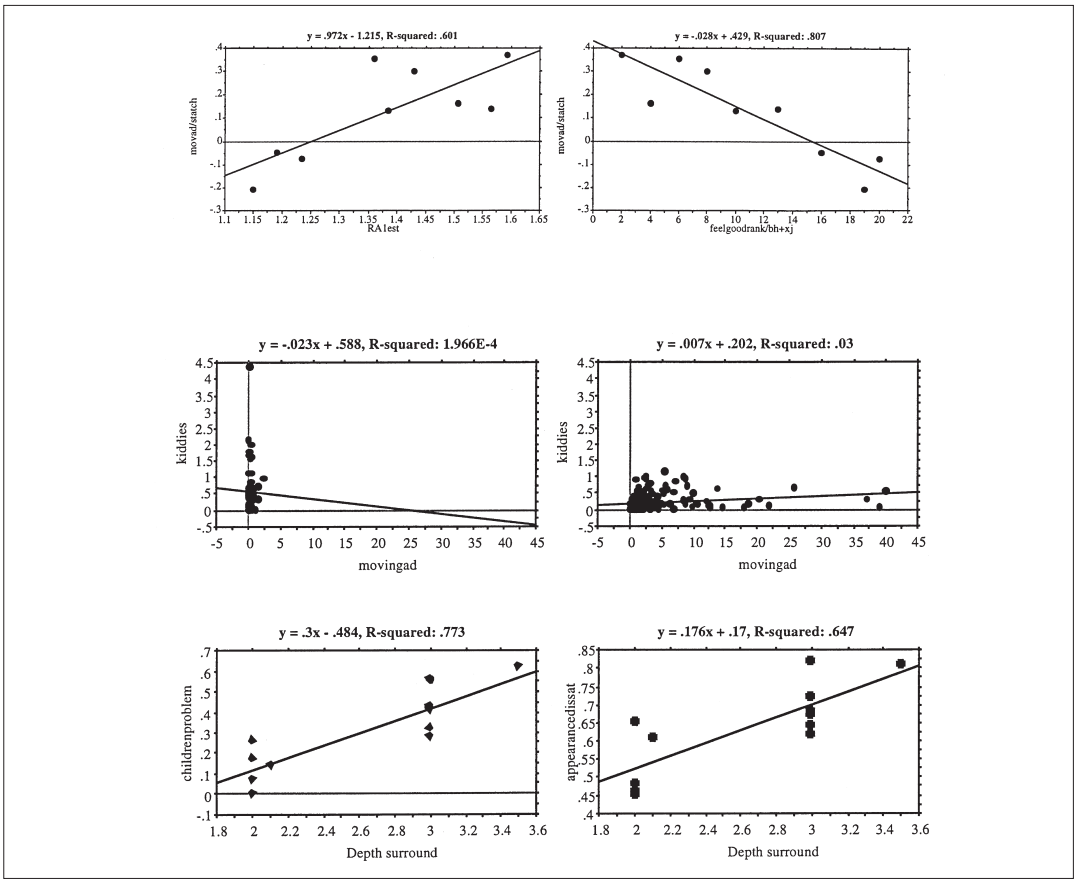
by a poorer correlation coefficient (the effect can also be checked visually), is strongly correlated with the degree of internal integration of the estate, that is, not with its degree of integration into the surrounding area, but with the degree of integration of the internal structure, as shown in figure 5.6a. The L-shaped factor was also correlated against the average 'feelgood' rank of the estates, an admittedly dubious measure obtained by asking researchers familiar with all the estates to rank them in 'feelgood' order. The correlation is strong, as in figure 5.6b, and does correlate well with common reaction to the estates noted by observers.

Even more remarkably, in another study of the King's Cross area[6] in which seven housing areas and three housing estates were studied, again (including the present estate), adult movement against static children was plotted separately for all street areas and estates. The results are shown in the scattergrams in figures 5.6c and 5.d. Nothing could more graphically express how dramatically the interface between adults and children changes from ordinary streets to housing estates. Without exception, the spaces in the estates have concentrations of children where there are few adults, while in streets this is never the case.

Citizens and space explorers

How can we generalise these results? The evidence suggests that the users of space naturally tend to divide themselves into two kinds: ordinary citizens, who use space as an everyday instrument to go about their business; and space explorers, like children,

Figure 5.6



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who are not so intent on everyday goals, and whose spatial purposes are essentially about discovering the potential of space – just as children's games like hide and seek explore potentials of space.[7] Now in ordinary urban space children are constrained by the spatial pattern to use space in ways which is not too dissimilar to that of adults. There simply is no other space available, except space specially provided like parks and playgrounds, and so children in the streets tend to remain within the scope of the multiple interfaces. When presented with exploration opportunities, however, children quickly find the lacunas in the natural movement system, creating probabilistic group territories which then attract others, and this usually occurs in the most integrating lacunas in the natural movement system.

Children are not the only space explorers. Junkies and methsheads are also space explorers, as in their way are muggers and burglars. Junkies and methsheads, however, like children, are social space explorers, and use space to create and form localised social solidarities. I suggest that all social space explorers tend to follow the same principle of occupying the most integrating lacunas available in the natural movement system. On an admittedly all too cursory examination of evidence it may even be conjectured that it is where the design of space is such that the lacunas in the natural movement system occur in the local integration core itself that an explosive potential is created. In spite of their huge differences in spatial geometry and density, from a syntactic point of view both the Broadwater Farm estate in north London and the Blackbird Leys estate in ex-urban Oxford, both loci of notorious, and notoriously sudden riots, share this structural feature in common.

It seems a characteristic of such space structures that when natural movement retreats from the integration core, as it does in both after the closing of shops, then the integration core becomes dominated not by multiple interfaces, but by its opposite: the domination of space use by a single category of user, in these cases teenage boys and youths. It is in such cases that confrontations seem to develop which easily turn into worse disorder. This is not to say of course that spatial design causes the eventual explosion into riot. It does not. But it does seem likely that badly designed space can create a pathology in the ways in which space is used, which a random spark may then ignite. Space does not direct events, but it does shape possibility. We should perhaps be no more surprised at the form anti-social events take in Blackbird Leys or Broadwater Farm than we should be surprised if people windsurf on open water or skateboard under the South Bank walkways.

The more common outcome of such unwelcome effects of spatial design is however chronic rather than acute. The pattern of space use in itself creates unease, untidiness and in due course fear, but not riot. We do not then need to invoke the deficiencies of state education, or the welfare state, or the decline in family life to understand these phenomena. They can be produced among ordinary families provided they live in extraordinary spatial conditions. They are systematic products of the pattern of space use arising in specific spatial conditions.

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Distinguishing social from architectural effects

Before drawing too many premature conclusions, let us look again at the original housing estate from the point of view of distinguishing the effects of architecture from those of social processes. We may do this because it is one of the few cases where we have not only spatial and space use data, as we have seen, but also extensive social data gained from a study[8] carried out by others and aimed at diagnosing the cause of the estate's apparent precipitate decline from wonder estate to 'problem estate' in a little over four years.

The estate is a visually striking, all white and low rise, the last throw, it has been said, of the Camden school of modernism. It opened in 1983 to praise not only from critics but also from the new residents, 80 per cent of whom approved the hyper-modern white architecture, using words from 'palace, paradise, fantastic' to 'modern, clean, bright'. Less than five years later, the social survey commissioned under urgent pressure from local police reports, reported that '71 per cent (of residents) give descriptions of the estate in negative terms, often with a menacing element: prison, concentration camp, forbidden city, criminal dreamland, battery farm, mental institution in southern Spain...' How had such a change in reported attitudes come about?[9]

In fact, a closer examination of the evidence[10] showed that one thing that had happened was that those who had interpreted the evidence provided by the social survey had indulged in a certain amount of 'architectural licence'. Most of the negative comments about the estate turned out to be about 'rubbish and dirt' and other management failures, and only about 30 per cent had made negative comments on the architectural appearance of the estate, and of these only a small minority were as readily headlinable as the ones quoted. 69 per cent in fact approved the appearance of their dwelling, and opinion was about evenly divided on the appearance of the estate as a whole. It seems in fact a matter of some research interest that those who were commissioned to survey social breakdown on an estate reported exactly that, with all the trimmings, even where the data did not support it. It will be suggested shortly that this tendency to overstatement may itself be no small aspect of the processes by which estate stigmatisation and degeneration typically occurs.

A careful reanalysis of the survey data, coupled with the results of the spatial analytic and space-use study, in fact showed a much more instructive story. Figure 5.7a is a matrix showing the correlation of various attitudes on the estate distributed according to small 'location groups' defined by the lines that make up the syntactic analysis. There are in fact two quite separate clusters of attitudes. Negative attitudes to the estate such as 'not liking the estate' formed a dominant cluster, which we might call the 'affect' cluster. But these do not correlate with other attitudes where we might expect a correlation, such as feeling unsafe, or fear of crime. These form a quite separate cluster. Factors like finding the estate friendly were not correlated with either major cluster, but only with having children, nor was 'being on the transfer list', which correlates only with not having wanted to come to the estate in the first place.

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Figure 5.7a

Correlation Matrix for Variables: X1 ... X8

	6 adequa...	pepl/bed...	10 est li...	14 home...	16a dwe...	feelunsafe	lotanxbu...	lotanxatt
6 adequate bedrm	1							
pepl/bedrm	-.999	1						
10 est like sum	.837	-.836	1					
14 home satis	.981	-.981	.925	1				
16a dwell app sat	.983	-.977	.892	.983	1			
feel unsafe	-.083	.073	.453	.113	.001	1		
lot anx burglary	.102	-.065	.199	.098	.256	-.086	1	
lot anx attack	-.054	.091	.12	-.036	.111	.025	.983	1

Figure 5.7b

Correlation Matrix for Variables: X_1 ... X_6

	Depth su...	lotanxbu...	feelunsafe	21s dirty	children...	appeara...
Depth surrou...	1					
lotanxburg	.755	1				
feelunsafe	.572	.716	1			
21s dirty	.741	.823	.604	1		
childrenprob...	.879	.708	.649	.742	1	
appearancedi...	.804	.755	.669	.68	.932	1

The 'affect' variables were not on the whole well correlated with spatial variables such as integration or depth in the estate, but the 'fear and crime' cluster were so correlated, most strongly with depth from the outside which, because co-presence falls with depth, is the prime determinant of the structure of the virtual community. The 'fear and crime' cluster were also correlated strongly with 'finding children a problem', which was itself correlated with depth in the estate, as shown in figure 5.7b. In contrast to the 'fear and crime' cluster, the 'affect' cluster was spatially distributed, but not according to integration or depth in the estate. In fact it showed a most curious distribution. If this group of attitudes among location groups was plotted from west to east in the plan, that is, according to the order of building the blocks on

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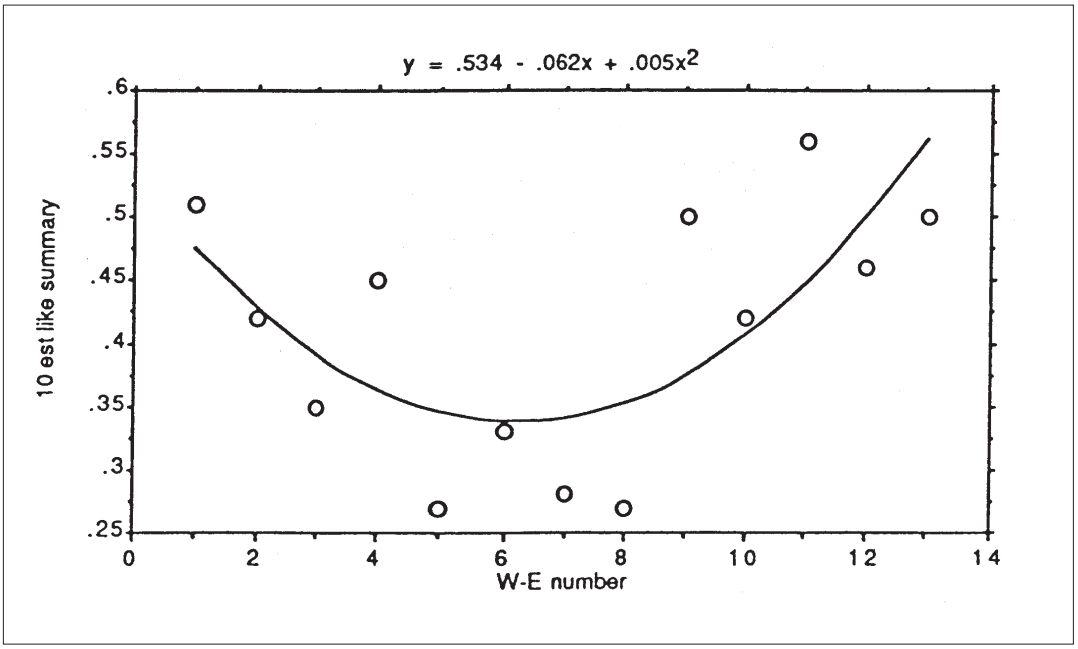
Figure 5.8



the estate, then the result is always the inverted U-shape distribution shown in figure 5.8. Examination of the date shows that this closely follows the changing policies pursued by the local authority as building progressed on the estate.

This can be shown most clearly by considering the 'affect' cluster of attitudes alongside two other variables with which they also cluster, namely the subjective perception of overcrowding and the objective calculation of the number of people per bedroom in the dwelling making up each location group. In fact, these two latter variables correlate so exactly that we may treat them as one. As figure 5.7a shows, both subjective and objective overcrowding increase as each block is built successively, and both are correlated exactly with attitudes. The agreement between subjective and objective factors shows in fact that as building progressed, the same-sized dwellings were being allocated to larger families, clearly reflecting the pressures on the local authority to respond to housing needs first and foremost. After first phase was complete, the 'affect' cluster of attitudes begins to pick up, following the U-shaped curve shown in figure 5.8, and in fact following the elimination of further overcrowding on the estate by building flats and single person accommodation, rather than houses for families.

In short, the concentration of negative attitudes to the estate in the central areas of the estate is clearly related to increasing overcrowding (both real and perceived) as larger families who didn't ask to come to the estate were allocated to the same-sized houses. In fact, in this case we are able to distinguish the effects of the social process from the effects of spatial design. The social process – that is, the changing allocation policies which sent larger and more single-parent families to the same-sized houses as the estate progressed – governs the dominant negative attitude cluster, but not fear and crime, which are largely determined by the patterning of space, and its consequent effects on the pattern of co-presence and co-awareness.

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The contrast between the two dominant attitude clusters is then most striking. One group, which is less spatial in that there would be no obvious grounds for expecting these attitudes to correlate with space, but which do express the most general stated attitudes, are clearly the outcome of the social process. The other group, which we would expect to be correlated with space because fear and crime are spatially located events, are correlated with space, and in the way we would expect. Attitudes to children are also critical. That spatial factors are implicated in finding children a problem lends further support to the possibility that the spatial design of the estate and the objective facts of co-presence, that is, the dramatic reduction in natural co-presence and the elimination of social interfaces with depth in the estate, are related to this attitude cluster. Other studies suggest that in general this is the case. Environmental fear is in the main an effect of the de-structuring of the virtual community. Such fear is an inference about people drawn from the structure of space. Fear, it seems, can be designed into estates, but only through the effects of spatial configuration on the virtual community.

Are the symptoms then the causes?

We may then in this case be fairly clear about the respective roles of space and social process in estate degeneration. How can the two be fitted together? It may be quite simple. First, the effects of spatial design are both systematic and quick to operate. Because they are systematic products of design, we must accord them some independence and probably some logical priority in the process. We do not require a pathological community to create a pathological use of space. It arises from consistent and predictable patterns of behaviour in particular spatial circumstances. However, we must also remember that the pathology of space produced by design is complex and social in nature, rendering many patterns of spatial relationship abnormal. Put simply, we can say that spatial design, operating independently, can create symptoms – that is, the external manifestation of what appears to be a disorder.

What could be more natural than that people should infer the disease from the symptoms – infer, that is, a pathological community from the appearances of pathology in the use, and subsequent abuse, of space. Now the heart of my argument is that such inferences, though as natural as inferring internal disease from surface symptoms, are usually illegitimate. The symptoms we see are a pathological product of an innovative and poorly understood spatial design. Unfortunately, they can all too easily appear to be signs of an underlying disorder in the community itself. In most cases, these inferences are probably an insult to communities who are struggling against the odds. Even so, sometimes the inference will also be made by the community itself, as well as by outsiders. A process of social demonisation can begin, instigated by the spatial process.

The people most likely to infer a pathological community from pathological appearances are those with responsibility for controlling the estate: local authority estate managers, social workers, the police, and so on. If an estate begins to acquire a bad name with any or all of these, then it is very likely that this in itself

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will initiate, engage, accelerate or even precipitate the policies and signs of the unpopular, then sink, estate: allocation of problem families, increased, though probably sporadic, police attention, public expressions of concern, and so on. One must ask: when the managers in the local authority began to assign unwilling 'problem families' to the Maiden Lane estate in significant numbers, did they believe that they were assigning them to the pristine paradise of the first occupants of the estate, or to an estate that was already acquiring a dubious reputation? If the latter was the case to any significant extent, then it seems likely that the appearance of spatially determined symptoms might actually help to activate the very social processes of labelling and social stigmatisation which will in due course ensure that the pathology of the community on the estate does eventually come to pass. To assign the socially weak and disadvantaged to places where the visual signs of disorder are already present, is a further event confirming the inferences that people are already making from the visible signs of disorder.

The apparent decay of the estate, we might suggest, initiates a process of stigmatisation which is then multiplied by the actual assignment of problem families. Theoretically, this implies that in a non-trivial sense the symptoms cause the disease. The outward and visible signs of pathology are the preconditions and perhaps sometimes the initiators of the social process of degeneration. If this is right then we must conclude that architecture should be seen more as a set of preconditions in which social processes can trigger social pathology, than a fully fledged cause of social pathology in itself. But nevertheless the independent effects of architecture are powerful, predictable, logically prior – and remediable. Probably they don't work without the social process. But without architectural effects, perhaps, the social process will tend less to pathology. Spatial design, we may suggest, lowers the thresholds of social pathology.

We may reasonably infer from this that the ordering and use of space is the linking mechanism between buildings and social effects. The use of space is determined by the ordering of space to a far greater extent than has been realised, and space use is more complex than has been realised, embodying subtle social patterns which become a pervasive feature of the experience of others in everyday life. Through architectural design, the use of space can either develop in a well-ordered way, or in a pathological way. Where it is pathological then it tends to become implicated in, and even to spark off, the social process by which estates degenerate. As such, space is neither necessary or sufficient for social decline, but it is is nevertheless frequently a strong contributing or initiating mechanism.

Architectural determinism and the virtual community

If the sole effect of spatial design is to create some kind of – virtuous or pathological – virtual community, then it seems that this would be enough to account for all the apparent effects of architectural determinism. At the very least, we no longer have a problem with a credible mechanism by which architecture and society might in general be related. All the relations between space and society that we have noted

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as regularities seem to pass through this basic fact. This does not mean that space is a determinant of society, though it could come to that. A virtual community is the product of space and is an as yet unrealised community, that is, it has not yet become the field of encounter and interaction which most social scientists would take as the most elementary of social phenomena. Because it is prior to interaction, the virtual community falls outside what social scientists have conceptualised as society.

However, there are now strong grounds for believing that the virtual community, and how it is structured, may be a far more significant social resource than has been realised until now. The first set of reasons stem from the effects of spatial design on the structure and density of the virtual community which seem to be involved in the pathology of spatial communities. These effects are powerful not because space is a strong determinant of society but because space and its effects on the virtual community are pervasive and insistent. In their very nature they are never absent. They come to be built into the very detailed patterns of everyday life so that although they are rarely obtrusive, they are never absent.

In the last analysis, then, all of the apparent effects of architecture on social outcomes seem to pass through the relation of spatial configuration and natural co-presence. This is perhaps because movement is not simply the unintended by-product of spatial organisation but its very reason for existence. By its power to generate movement, spatial design creates a fundamental pattern of co-presence and co-awareness, and therefore potential encounter amongst people that is the most rudimentary form of our awareness of others. As we have shown, virtual communities have a certain density and structure, and are made up of probabilistic interfaces between many different types of person: inhabitants and strangers, relative inhabitants and relative strangers, men and women, old and young, adults and children, and so on.

Spatial design can change the structure of these patterns of co-awareness, and lead to such pathological phenomena as the radical reduction in the density of the virtual community so that people live in space which makes them aware of almost no one (earlier we called this the ‘perpetual night’ syndrome, since in some housing estates awareness of others during the day was little better than normal residential areas during the night), and which changes the structure of patterns of co-presence and co-awareness, leading to fear, the domination of some spaces by single categories of user and the emptying out of other spaces. The long-term effects of these ‘social structures of space’ are perhaps the key to the spatial pathology of communities. We see now also that they were all changes in the structure of the virtual community.

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Notes

1 For a recent review see H. Freeman, *Mental Health and the Environment*, Churchill Livingstone, 1984.

2 The two best known studies, Oscar Newman's *Defensible Space*, Architectural Press, 1972 and Alice Coleman's *'Utopia on Trial'*, Shipman, 1984 have both been criticised on these grounds.

3 B. Hillier & J. Hanson, *The Social Logic of Space*, cup, 1984.

4 The movement pattern correlates strongly with integration, but only when the estate is embedded in the larger scale surrounding area and integration values within the estate are read from the whole system. With spatial designs of the type found on this estate, this has the effect that integration values fall off with depth into the estate, as shown by the layers in the dark point scatter. If analysed on its own as an isolated system, the correlation between integration and movement is poor. All these effects are common for housing estates.

5 Hillier et al., *The Pattern of Crime on a South London Estate*, Unit for Architectural Studies, ucl, 1990.

6 Reported in Hillier et al., 1993, referred in Chapter 4.

7 See *The Social Logic of Space* Chapter 1.

8 See Hunt Thompson Associates, Maiden Lane: *Feasibility Study for the London Borough of Camden*, 1988.

9 Hunt Thompson.

10 B. Hillier et al., *Maiden Lane: a second opinion,* Unit for Architectural Studies, 1990.