

the well-known Booth map on London, in which socioeconomic classes are plotted from gold for the best off, through to red for merchant grade houses, then through pink to grey and black for the poorest. The most integrated streets are lined with red, and as you move into the less important, and less integrating streets, the grade of housing falls off, leaving the poorest in the most segregated areas. There is also a subtler organization concealed in the Booth map, one which provides an important clue to one of the hidden secrets of urban space: how different uses and economic classes are mixed in the same area by using a principle that can be summarized as 'marginal separation by linear integration'. If we look carefully we can see that different grades of housing – and in other situations we will find different land uses – may often be in close proximity but separated effectively by being on different alignments, often as part of the same urban block. The fundamental land use element is not the zone or even the urban block but the line: land use changes slowly as you progress along particular lines of movement, but can change quite sharply with ninety-degree turns onto different alignments. Since we know that the pattern of alignments is the fundamental determinant of movement, we can begin to see that the structure of the urban grid, the distribution of land uses, and built form densities are in the historically evolving city bound up with each other in a dynamic process centred on the relation of the grid structure to movement.

Which then is primary? Let us argue this through the spatial distribution of retail, the commonest non-residential land use. We may already have been suspected of having confused the effects of spatial configuration on movement with the effect of shops. Are not the shops the main attractors of movement? And do they not lie on the main integrators? This is of course true. But it does not undermine what is being said about the structure of the grid as the prime determinant of movement. On the contrary it makes the argument far more powerful. Both the shops and the people are found on main integrators, but the question is: why are the shops there? The presence of shops can attract people but they cannot change the integration value of a line, since this is purely a spatial measure of the position of the line in the grid. It can only be that the shops were selectively located on integrating lines, and this must be because they are the lines which naturally carry the most movement. So, far from explaining away the relation between grid structure and movement by pointing to the shops, we have explained the location of the

shops by pointing to the relation between grid and movement.¹⁰

Now of course in a sense to say this is to say the obvious. Every retailer knows that you should put the shop where people are going to be anyway, and it is no surprise if we find that the structure of the urban grid influences at least some land uses as it evolves. It would be surprising if it were not the case. However, a little more than this is being claimed. It is being suggested that there is an underlying principle which, other things being equal, relates grid structure to movement pattern not only on the main lines in and out of a city, but also in the fine structure, and through this gives rise to a whole multiplicity of interrelationships between grid structure, land uses, densities, and even the sense of urban wellbeing and fear.

Multiplier effects and the movement economy

We can pursue this by thinking carefully about what it would take to produce this degree of agreement between grid structure, movement, land uses and densities. We find ourselves unavoidably led towards a theory of the general formation of the city through the functional shaping of its space by movement. Let us begin by considering that. An urban system, by definition, is one which has at least some origins and destinations more or less everywhere. Every trip in an urban system has three elements: an origin, a destination, and the series of spaces that are passed through on the way from one to the other. We can think of passage through these spaces as the by-product of going from *a* to *b*. We already know that this by-product, when taken at the aggregate level, is determined by the structure of the grid, even if the location of all the *a*'s and *b*'s is not.

Location in the grid therefore has a crucial effect. It either increases or diminishes the degree to which the movement by-product is available as potential contact. This applies not only to individual lines, but to the groups of lines that make up local areas. Thus there will be more integrating and less integrating areas, depending on how the internal structure of the area is married into the larger-scale structure of the grid, and this will mean also areas with more by-product and areas with less.

Now if cities are, as they were always said to be, 'mechanisms for generating contact', then this means that some locations have more potential than others because they have more by-product and this will