Streetsweeper

'the kind of problem which cities pose is a problem in handling organised complexity' Jane Jacobs (1961)

Towns and cities are complex systems shaped by the interaction of politics, economics, technology, fashion, culture, climate, site and myriad individual decisions. Geographically the character and form of the city varies as local differences effect the production and growth processes, however across the globe our towns and cities whilst different display a degree of similarity; London is recognisably different from Tokyo, yet they are both recognisable as cities. Using the language of chaos theory this would be described as 'deterministic chaos' – variation within defined boundaries.

Towns and cities are formed from a number of common elements, e.g. buildings, spaces and vegetation. These combine with the local topography to produce various degrees of irregularity in terms of layout and visual appearance. It is this combination that helps define the physical character of a place. Using the techniques of fractal geometry it is possible to measure this irregularity, to plot the underlying rhythms that characterise a place and possibly to use this information in future design interventions.

Jane Jacobs (1961) wrote that *'it is futile to plan a city's appearance or to speculate on how to endow it with a pleasing appearance of order, without knowing what sort of innate functioning order it has'*. The newly emerging sciences of complexity, including chaos theory and the allied field of fractal geometry, may help us in identifying this innate functioning order. They are concerned with the identification and understanding of the underlying complexity of the real world. Gleick (1997) argues that they offer *'a way of seeing order and pattern where formerly only the random, erratic, the unpredictable – in short, the chaotic – had been observed'*.

Chaos theory, originally formulated from the study of weather patterns, deals with processes and the predictability of systems. Fractal geometry, originally formulated by Mandelbrot (1977) to measure coastlines, deals with the products of chaotic systems and lends itself to the decoding of

apparently irregular patterns. It is now used in medical applications, market fluctuation analysis and computer compression techniques, and has even been employed by Bovill (1996) to examine architectural features.

The challenge is to present ideas on ways in which these new sciences may be of use in urban design, using theoretical approaches, existing research methods, and software available through the Internet, to investigate the social, economic, political, and/or physical aspects of urban design using concepts and techniques from the sciences of complexity.

References

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