

**THE ECOLOGY OF KNOWLEDGE OF METROPOLITAN STRUCTURE**

by

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Some years ago Jerzy A. Wojciechowski, Professor of Philosophy at the University of Ottawa, asked the question: "Can man survive the Development of Knowledge?" He saw "knowledge as a source of problems" in that the more one knows, the more problems one is able to perceive, and the more conscious one is of one's own lack of knowledge. He came to a conclusion that "the central issue of our times is one of the relationship between man and his knowledge". The acquisition of knowledge has, in fact, given us the insight to identify problems. His argument revolved about the complexity and abundance of knowledge as an entity that is made by man for man, yet is distinct from him and essentially inaccessible other than in a fragmentary and incomplete sense. He argues that man's perception of problems is proportional to his knowledge, whereas knowledge (or the lack of parity in its dissemination) is, simultaneously, the most powerful factor in creating inequalities among men. His paper finally refers to the progress of knowledge from an historical viewpoint and concludes with the observation that knowledge is just beginning to explore the planetary ecological paradigm. The principle philosophical question of today should, therefore, probably be "How are we going to make use of the complex abundance of knowledge creatively?"

Wojciechowski was, of course, referring to the whole body of

knowledge. It could, however, be postulated equally effectively with reference to the body of knowledge related to the growth and change of cities, metropolises and megalopoli.

In sense, in the planning profession, an urge to try to come to grips with an understanding of the overall global demographic patterns of growth, density, migration, stagnation, deterioration and intensification of urban environments. There is a search for universal demographic patterns or at least for patterns that will hold good in the various regions of the world, be these developed or developing, socialist or capitalist, or some other generic classification. The information about urban growth, however, is so complex that it is often narrowed down to one or two salient factors mostly related to population magnitude and population density on a world wide basis or to other factors which can be quantified into understandable "pockets" of information which are seemingly meaningful from an analytical or statistical point of view.

Such statistics are valuable inputs to the body of urban planning knowledge which is growing in complexity and comprehensiveness on a daily basis. This statistical research currently appears to be the major intellectual thrust of planning today.

However, the perspective of trying to understand global urbanisation factors and problems from the United States or from other industrialised nations is questionable because of the extreme nature of this type of society. I am referring to extreme wealth and the extreme difficulty of comprehending extreme poverty. I believe that it is very difficult to transpose one's mind from the wealth of, say, Washington D.C. to the poverty of Lagos or Calcutta. Or from London in England to Lima Peru or Maputo Mocambique. Certainly there is a kind of intellectual schizophrenia in my own country in trying to comprehend the culture of poverty that prevails in Soweto from an armchair in Johannesburg's affluent northern suburbs barely 20 km away. It is clearly necessary for us planners to concentrate our efforts on and from much much lower thresholds of wealth.

Leaving that important difficulty aside for the moment, it is necessary to understand that knowledge - analytical knowledge - is essentially a tool for creative action. It is not a substitute for creativity; it informs the creative process which falls within the ambit of physical planners, engineers, legislators, economists, urban designers and architects who comprise the planning professions who are actually executing the work.

Yet the role of the profession essentially concerned with creative action, or those who chose to be so has, in recent times, been relegated to that of either romantacists or pragmatists who pay lip service to the intellectual pursuits of the analytical planners. This dichotomy between the professions and within them, between professionals represents a major communications problem. It is like "the sound of one hand clapping" where the connections between creative action and analytical thought processes do not occur.

It is, therefore, valuable to speculate on the possibilities of interrelating and communicating research findings in such a way as to be useful to those who are actually in a position to be able to influence and improve the quality of life in human settlements. This is a different problem from that of extrapolating statistics and predicting the trends that are indicated. Essentially we need to move from a state of "analysis paralysis" on one hand and creative dreaming in a vacuum on the other to a state of dynamically informed creative action. Predictions and statistics may be correct, but the information is only useful if it can be used to improve the quality of life of some of the many desperate people throughout the world who live in metropolitan conditions of desolate poverty.

The reference is to "some" of the people, not because the problem is of unmanageable magnitude, (which probably it is) but rather because each of us as an individual has only limited influence on the current state of affairs. On the other hand, if ALL of us who are actively involved in directing the evolution and change within human settlements, in one way or another, could digest and utilise the statistical research that is available in a meaningful, creative and useful way within our particular spheres of operation, then at least an enabling structure for the improvement of the quality of life will result for those who fall within one of these spheres.

This is not a plea for "Rational" planning that apparently flows from statistics. "Rational" planning is a misnomer that simply does not exist in the case of human settlements. It is also not a plea for the "imaginative" planning of an esoteric nature which involves the current signs, images and imagery within the confines of the latest fashion or fantasy of the professional journals or the latest most unusual and innovative avant-garde utopian solution. The history books are full of these utopian dreams which remain as the evocative drawings they are meant to be. Le Corbusier's plan for Paris is one of many such examples.

Rather, the plea is for creative planning where it is able to function within realistically interrelated parameters that have

been codified or prepared in a form that models the creative thought process of asking "if-then?" questions so that no matter how outlandish and intuitive the "if" question, the rational "then" response is available in ready form. In other words, there is a need for a series of information models that enable relatively simple retrieval and extrapolation for particular problems under consideration.

This requirement is important in order to prevent the relevant research and relevant knowledge from remaining purely academic. The models need to be prepared for the specific tasks that are undertaken in the planning processes, be they of a strategic, political, economic, physical or organic nature.

As an example, our firm (which is a private consultancy) is involved in consultations related to the physical and strategic planning for, what in global terms are, relatively small communities which vary in population from as little as 500 up to about 150 000. In the cases of the larger settlements, the problems of poverty and how to either ameliorate or eliminate them are at the forefront of the creative processes that direct our work. We are, in contrast, also involved as consultants in advising on how to improve the quality of downtown urban environments in the city of Johannesburg and three of the many other satellite towns that form the Witwatersrand conurbation. This is an area of wealth comparable to most of the

industrialised nations.

In global terms, these are minor involvements which result in minor improvements to human settlements. They are, however, direct, effective, localised and result in actions having a direct bearing on improving the quality of life. There must be many many planners throughout the world with similar limited, yet effective, roles at their limited scale. Throughout the world exploding human settlements are growing with people of extremely different levels of knowledge and capability in "control". These may be sophisticated planners, engineers, economists or politicians or the chief of a tribe or the most active member of a socially cohesive squatter settlement or merely the head of a family. It all depends on the level of knowledge, the ability to organize and the ability to utilise knowledge creatively that exists within the society.

In these terms then it is people in general who are seen as planners and it is these people who require support and easy access to appropriate levels of useful data and knowledge as prepared by academics. A complex dissertation in an esoteric publication for the use of doctoral students cannot be effective unless in some way the knowledge contained therein can be related and disseminated to the many levels and needs of all those people involved in planning activities.



In the case of the sphere of work in which our firm is involved we have evolved a suite of computer programmes that are operable on the simplest micro-computer and that allows a comprehensive examination of the physical, economic, political, environmental, transportation, infrastructural services and utilities and interrelationships of urban density. The model relates population density (which is the most appropriate unit for assessing urban infrastructural requirements and costs), building density (which affects the nature of the living environment and the availability of public and private land for recreation, parking, mobility and tranquility) and occupancy density (the rate at which people occupy floor space and the socio-economic consequences of this). Population density generally has metropolitan implications at a wider scale, whereas building density and occupancy densities have local influences on the social and physical character of a neighbourhood and the quality of life therein.

Occupancy density is a key consideration in relating building density (or the amount of floor area) to population density (the number of people within a given area) and essentially a function of one's ability to afford floorspace. For example, higher income groups occupy much more floor area per person than do low income groups. Family size is also a factor where

larger families occupy less area per person than do smaller families with the same income.

At the metropolitan scale, on the other hand, various transportation systems such as busses, light rail, undergrounds etc. become viable at certain densities and certain population thresholds. The costs of utilities such as water, sewerage, roads and electricity vary in effectiveness at various population densities. We have found that these, and a host of other statistics are already available and have been researched by numerous people in a variety of situations and have been publised in different forms that are accessible in their own context but not on an interrelated basis. Barry Senior, a senior partner in our firm, has, therefore, spent some years in referring to as much of the available or published statistical information as is possible and has set up interconnected normographs which have now been transposed into a micro-computer programme which we have tested on several real projects within our own office. To our surprise more than anyone else's, the results have been surprisingly accurate and more important, extremely useful in the day to day applications of our planning and design activities at both very low income levels and at levels of comparative wealth.

We are now able to ascertain, without the trial and error of time consuming sketch designs or even preliminary sketches, the

likely range of physical environments, anticipated costs and building types for a fixed assumption such as family income or a predetermined population density. Furthermore, because of the ability to vary inputs and assumptions, the model is applicable to all situations that characterise different world economies and levels of development. This work, in fact, is the subject of a doctoral thesis which is to be published early next year by Barry Senior, and should prove useful to consultants and planners who are involved in this category of work.

The usefulness of simply understandable, easily communicable, interrelated information of this kind is that it can be utilised usefully by many planners in a meaningful and practical way. There are, I am sure, many other statistics hidden away in academic libraries that could be similarly reorganised and made useful so as to be able to be used on a local basis.

The example I have given is by no means exhaustive. It is merely applicable to the range of work undertaken by our particular type of consultancy, which is one small cog in the many wheels of re-directing the future an evolving metropolis. Other than its contribution within that particular framework of action, its didactic message should be understood in its

broadest, creative, context. That context, I would have thought, would be the necessity of trying to organise, interrelate, correlate and communicate most of the existing statistical urban knowledge so that it can be usefully utilised on the broadest scale by the simplest minds. It would free up dynamic creative processes by the rapid provision of comprehensive information without slowing down the momentum of the design process.

At the largest scale, it may give new insights into the potential of solving the problems of the evolving metropolis. It is, perhaps, a search for an ecology of metropolitan knowledge. And that ecology includes the growth and migration of populations at the macro scale as well as the quality of life (or lack of it) that it leaves in its wake at the micro scale - plus the ability to inform that very important potential of man's ability to improve his life-style by utilising his own exceptional creative skills and these are surely needed to-day to address the problems of some of the cancerously growing cities of the third world.