Working Paper

School of Geography

University of Leeds

Working Paper 302

"NEW" METHODS FOR SPATIAL PLANNING: AN INFORMAL REVIEW OF PERFORMANCE.

A.G. Wilson

School of Geography
University of Leeds
LEEDS LS2 9JT.

April 1981

"NEW" METHODS FOR SPATIAL PLANNING: AN INFORMAL REVIEW OF PERFORMANCE*

A.G. Wilson
School of Geography, University of Leeds, LEEDS LS2 9JT.

1. Introduction

'New' methods for spatial planning have been based on contributions from quantitative geography and other social science disciplines in the development of models and related concepts and techniques. There have also been substantial new insights into the nature of planning itself. Put very broadly, it can be argued that a representation of a city or a region on a computer as a mathematical model enables 'experiments' in policy and design to be conducted on the machine so that the 'best' policy could then be selected for actual implementation. All this begs a lot of questions. Are the models good enough for this? What does 'best' mean? 'Best' for whom? Nonetheless, in the mid-sixties, as the 'new methods' practitioners gathered momentum, there was a lot of optimism in the air. It did seem possible that some fundamental problems could be tackled, and that the new methods would help. But: it can be argued that relatively little progress has been made; and indeed that many problems are now worse. So the question has to be put: have the new methods failed to live up to their promise? Some would prefer a more serious charge: have the new methods, in some cases at least, exacerbated problems? These questions form the focus of this essay.

The argument is structured as follows. First, in section 2, we review trends and issues to provide a backcloth. Secondly, we look at the position reached with the 'new methods' with particular reference to mathematical modelling but not wholly so, and discuss what has been achieved and what could have been achieved. Thirdly, we present the radical critique of the new methods. Finally, we draw the threads of the argument together with an assessment of prospects for the future.

---

*Presented at a seminar of the School of Public and Urban Policy and the Departments of Regional Science and City and Regional Planning, University of Pennsylvania, March 1981.

It is probably worth stating at the outset the form which the argument is going to take. The main points can be summarised as follows, roughly in the order in which they arise. Some of the most serious problems perceived now were not evident on the same scale in the 1960's. It can be argued that, for both old and new problems, not enough use has been made of what would conventionally be described as the 'new methods' and reasons for this are explored. But, with or without the help of the radical critique, it can be argued that the persistence of problems is more to do with politics and power rather than with the availability of techniques. This view is strengthened from a radical perspective; and that perspective offers, at least, some important new insights. Finally, it is argued that the new methods are directly useful, and will continue to be for a certain class of problems; they can be 'expanded' in various ways; that some fundamental breakthroughs in understanding could be imminent and will be worth pursuing in a programme of fundamental research; but that it should be clearly recognised that the 'methods' as such cannot solve all the problems for reasons which can be articulated.

2. Trends and issues

To fix ideas, we will focus on trends in British cities in the last thirty years. It is relatively straightforward to make what are often minor modifications to paint the corresponding pictures for other Western cities. The main features can be summarised as arising from: (i) population growth, (ii) economic growth (and rising per capita incomes and expectations of a continuation of these - but with a distribution of income which is roughly constant), (iii) rising car ownership (and much road building), (iv) better housing, and (v) better services.

The processes which have driven cities and have produced (or have been generated by) these features, have produced a strong polarisation between inner cities and suburbs. Population growth has itself fuelled economic growth and much building of houses and service facilities. But this has been combined with slum clearance and Council development in inner areas and the use of more land for new

private housing for the part of the better off in the suburbs (coupled with the cars they can use to get there) so that steadily increasing social polarisation is the order of the day. The fact that many jobs, particular in the services or newer industries, have also suburbanised has strengthened the decentralisation process. The transport pattern is correspondingly increasingly car and road dominated, usually with a road pattern which has a major radial structure to facilitate centre-city access from the suburbs and a ring road structure, originally thought of as concerned with through traffic, but mainly used to provide suburban circulation. There is often a spiralling down of public transport.

One of the features of increasing car ownership and the polarising spatial distribution is the increasing inequity of accessibility among different social groups. This has to be coupled with a less commonly-remarked general trend in the development of urban structure: the tendency towards larger service units. There are bigger schools, hospitals, health centres, shopping centres and so on. The benefits of increasing size have to be set against increased cost of travel; this is of little consequence to car owners but often creates serious problems for those who do not have a car available - the young, the old, the poor, the sick; in other words those who, because of the nature of the system they find themselves living in, find themselves disadvantaged, often multiply so.

This can be taken as a reasonable, if sketchy, portrait of urban development up to about 1973. From this date, there have been a number of significant developments. The first of these is the crisis in energy supply and corresponding increases in prices following the major OPEC oil price rise in 1973. The trend of rapidly rising energy prices can be expected to continue. Some would broaden the concerns with energy to observe, or anticipate, more general shortages of resources. An apparent consequence of the oil price rise was an economic recession. But this has now lasted so long, and seems in some ways endemic, that other (at least additional) causes must be sought. Increasing unemployment is now a major problem. It may be the case that much of this is structural unemployment created by

capital-intensive processes being substituted for labour-intensive ones. When industry automated from the fifties onwards, surplus labour was taken up by a rapidly-growing service sector. When the service sector automates, the future for employment prospects seems more bleak.

This period has also coincided with a rapid fall in birth rates. (Do people now need two incomes per family to maintain a 'decent' standard of living?) This is having a significant effect on demands for certain kinds of services - schools for example. When this trend is coupled with the development of larger service units (like the schools just mentioned), new problems are created. Demographic trends are having an opposite effect for some other services. For example, there is now a very rapid rate of increase in the population of over 75's. This is increasing the demand for health services which is so rapid that it cannot be met.

A particular consequence of the recession (and possibly arising out of separate political and policy shifts) is the pressure on public expenditure. For many years, the kinds of problems referred to in the previous paragraph could be tackled by the reorganisation of public facilities, whether involving growth or decline, which would be financed out of growth. Now, very large new projects are mostly out; major reorganisation is very difficult; there may be a decline in the quality of many services, so that the steady trends in improvement referred to earlier have been reversed.

So what are the issues and the problems? Many of these are at least implicit in the account of the main trends above. The main problems, however, can be usefully summarised under two related headings. Both related to social polarisation and they are distinguished by the economic and spatial aspects of this. First, there are too many essentially poor people; and this poverty can be seen as the root of many forms of disadvantage. Secondly, the disadvantaged members of the community tend to be concentrated (though far from wholly so) in the worst physical stock which makes up the centre or inner city areas. A good starting point therefore is to list the kinds of problems suffered by inner city residents. They are

likely to be poor and with inadequate skills for the modern employment market. There is thus a much higher level of unemployment than elsewhere. They live in poor quality housing, often overcrowded and lacking in basic facilities. They lack income to do anything about it, and they lack the opportunity to improve their incomes. Training and jobs are not available on a sufficient scale. The available services are poorer than elsewhere. School buildings are often old and inadequate (and under pressure because of falling rolls) and the best teachers want to live and work in the suburbs (thus offering themselves a better living environment, a shorter journey to work and a better working environment; fewer problems with their pupils, more parental support; and so on). A similar argument can be extended to other services. In general, the accessibility of inner city residents is likely to be poor. This follows from the remark made earlier about the tendency for service facilities to be larger. Most inner city residents will not have a car available and many may face out-commuting to work.

Similar arguments can be used for disadvantaged families not resident in the inner city. Such people have some of the advantages of a suburban location but are often without the income (and hence, for example, the cars) to take full advantage of it. Nor are many of the problems confined to the poor. In many middle class suburban families, there will be one car mainly used by the husband for the journey to work. This generates other kinds of problems of isolation and inaccessibility for housewives and children left behind. Their problems are less, of course. They have decent incomes and they have the car at evenings and weekends; but it is worth making clear that there are other kinds of problems.

The main problems therefore can be summarised by the notion that urban development has proceeded in such a way that there is a sector of society - perhaps 30 to 40 per cent according to the indicators used - which have quite serious problems. There is another group within this, perhaps 10 to 20 per cent of the total, with very severe problems indeed. If planning techniques are proving inadequate for such 'problems', then this is an important question to investigate. As we do so, the problems outlined should be borne in mind as a backcloth (while recognising, as we did above, that there are others).

3. The 'new' methods

There seem to me to have been two major kinds of advance in methods for spatial planning. First, there is much more understanding, at least in a formal sense, about the nature of planning activities. Secondly, there is the development of modelling, usually mathematical and computer modelling, which in principle provides a basis for the analysis of problems and for the computer experimentation with alternative plans and policies. We consider each of these topics in turn.

A number of authors, in different ways, have distinguished three different kinds of planning activity. These may be characterised as policy, design and analysis. They are closely interrelated of course. Policy is concerned with the specification of goals and the value basis under which planning is undertaken. Design is concerned with the generation of alternative plans (where a 'plan' is a set of policies). Analysis is concerned with the representation of our understanding of structures and trends. This understanding can be used to analyse the nature of problems, to foresee problems and needs arising from known developmental trends, and to predict the impact of plans. In this last activity, it connects closely to policy and design: a set of alternative plans can be tested and measures produced of the effectiveness of each; the final policy decision is then the choice of the best plan in the light of this information. Much has been made, by critics, of the fact that 'real' planning is always more complicated than this. And of course it is. But it will be argued that the formal recognition of an idealised activity is a useful one. Otherwise, there is a danger that 'real' planning fails to grapple with the nature of the policy and design questions at all; or planners forget the complexities of the world they are planning by giving insufficient attention to analysis.

The heart of the policy area is the specification of goals and weights in such a way that it is possible to decide between alternatives *given* the scarcity of resources available. In other words, policy in this sense has to be realistic, to be able to be the basis of evaluation procedures. It is also worth emphasising that even if these activities are not recognised formally, they will be present.

If, in a particular governmental framework there is no formal statement of goals and weights in planning, there will be implicit weights and goals evident in the decision which are actually taken (and this remains true even if a 'do-nothing' policy is adopted: that in itself is a policy with implicit goals and weights). The nature of policy is best exposed by relating it to the task of evaluating alternative plans. There must be some measures, implicit or explicit, quantitative or qualitative, of the impact of a plan. It is important that these are calculated so that the incidence of costs and benefits of each plan are measured. And thirdly, within the policy making process there will be, again implicitly or explicitly, weights which reflect the valuation given to the different groups or classes.

The main advance in relation to design is the recognition of its combinatorial nature. There has been a tradition in planning, probably stemming from its architectural and incrementalist origins, that the task of the designer was to seek a unique best solution. In practice, this represented, unconsciously, a 'satisficing' approach; but the problem with it was that it failed to recognise the complexity of the city (and the secondary and higher order consequences of plans and policies). Alexander also drew attention to the self-conscious nature of the modern design: he saw it as a shift from an incremental unselfconscious procedure. But it may well be that, given the rapid rate of technological, social and population change, that self-consciousness, and hence the combinatorial problem of there being a very large number of possible solutions, has been forced on to the planner. This leads to what Steger called the need for 'the efficient generation of efficient alternative plans'.

Finally, we can review briefly the progress made in analysis through modelling. A convenient way of summarising the main submodels is shown in figure 1.

Population and economic activities are distinguished by representing them on the left and right hand sides of the diagram respectively. It is assumed that, for a given study area, it will be appropriate to have spatially aggregated population and economic

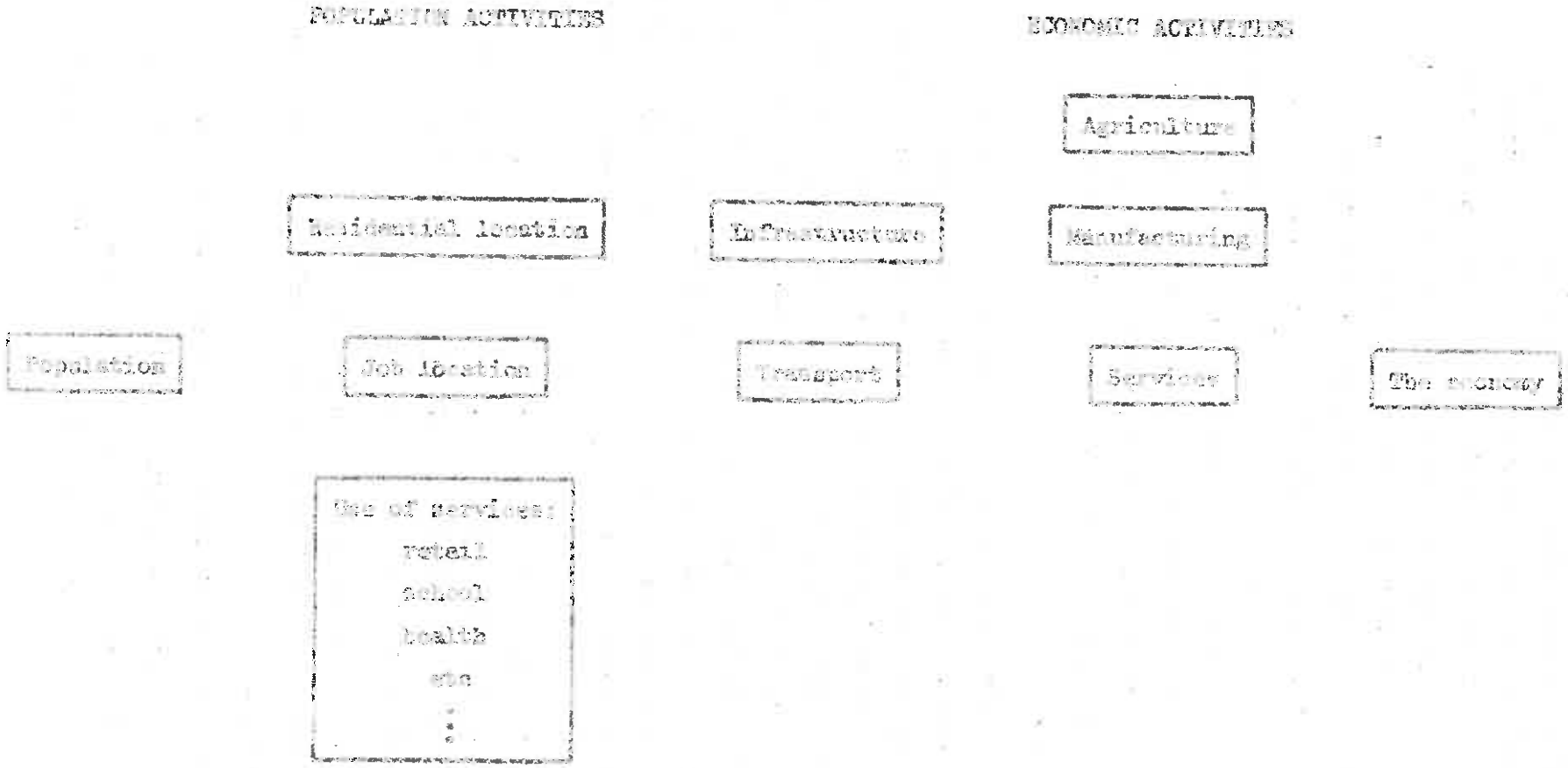
POPULATION ACTIVITIES
ECONOMIC ACTIVITIES
Agriculture
Residential location
Infrastructure
Manufacturing
Population
Job location
Transport
Services
Other economy
Use of services:
retail
school
health
etc

Figure 1.

models which provide a crucial backcloth for spatial planning. These are shown on the extreme left and right hand sides of the figure respectively. The main focus, however, is on the spatial distribution of population and economic activities, and on the interactions between subsystems represented by transport flows together with the physical infrastructure which carries the activities.

This is not the place to review, except to some extent below in the light of criticism, the progress which has been made in the development of models. Suffice it to say that, among the spatial models, there has been much experience with transport models - indeed for many years, they formed the basis of a major million-dollar-million-pound industry. There has been more limited experience with retailing and other service models, and probably more limited experience still with residential location and housing models. The second most popular model usage has been the sketching of a broad picture of urban development through the use of comprehensive models, particularly those based on Lowry's 1964 'Model of metropolis'.

The models which have been made available have often been called descriptive and said to extrapolate trends. The real situation is almost certainly more complicated than this. It is useful to consider science, and in this case urban modelling as a particular branch of social science, as being concerned with increasingly deep levels of explanation of phenomena. As a young science, urban modelling is located at the 'low level of explanation' end of a spectrum. Given the complexity of cities and the fact that substantial effects in the field have only been mounted in the last twenty years, this is hardly surprising. But, for the present, three comments will suffice. We then pursue deeper questions in the context of radical critiques below.

First, many of the models in use in planning are inadequate and oversimplified relative to the state of the art. The reason for this is connected to the next two comments. The second remark is that there have been relatively few places (if any) where models have been used as routine tools within a sophisticated technical environment. This probably relates to the training of staff, or lack of it; and the difficulty which many planners have found in coming to terms

with the 'new methods' - which henceforth we will call the new planning technology'. The investment which would be involved in rectifying this situation would be very modest compared, say, to that involved in defence budgets or the space programme. This is an implicit (revealed-preference) measure of the relative importance attached by government to urban problems. The third remark is that there has been inadequate contact between planning practice (including the use of models) and the corresponding research world. This question is connected to a deeper one of research organisation, and this is taken up in depth elsewhere.

The force of these comments is to argue that 'best practice' models have not been systematically used in planning at all. It is important to bear this in mind in the assessment of the criticism of models, much of which is based on out-of-date concepts, and can be responded to on such a basis.

It is also important not to be too complacent. In the next section, therefore, we attempt to portray the kinds of criticims which have been made of new planning methods as a basis for further review, a response to these criticisms where appropriate, and a discussion of the implications for a research programme.

4. The radical critique

We can take 'radical', following Raymond Williams, to mean something concerned with 'vigorous and fundamental change' and a radical critique to be therefore directed to such an end. It is useful to identify three kinds of radical perspective. The first is a 'conventional' argument that something is wrong with the new planning technology. The second is based on the idea that there has been a major shift of goals - either in the minds of planners or in society more broadly. Concerns with equity and with the quality of the environment are offered (by Hall, for example) as illustrations. Thirdly, it can be argued that a broadly Marxist perspective offers more opportunities for radical change, both in analytical and in political senses.

We can identify a number of interrelated broad issues which can be tackled from these various perspectives. First, there is the argument that urban modellers have failed to focus on the main processes of urban development, and in particular have neglected to study the influence of some of the most significant agents participating in those processes. Secondly, it is argued that urban analysts have not focussed sufficiently effectively on topics which are central to planning. Thirdly, an inadequate account is offered of the political processes within which planning systems are embedded. Fourthly and finally, there is the more serious charge, referred to earlier, that the 'new methods' have actually exacerbated urban problems. Or there is a slightly weaker but nonetheless damaging version of this (analogous to wilful neglect): that by focussing on less important topics, planners have somehow 'allowed' certain urban problems to develop and to get worse. We consider these issues in turn and illustrate them with examples, first from the conventional point of view and secondly from a Marxist viewpoint. The arguments of those who argue that perspectives have shifted will be largely picked up under the 'conventional' heading.

As an example of the kinds of agents neglected by urban modellers, consider the financial institutions which are part of the urban development process. Property has been an important form of investment for both individuals and institutions. It can be argued that the peculiarities of the property market, and the acquiescence of local authorities and government departments in a process which allowed developers to make 'abnormal' profits, have generated much of the present form of city centres. And it can also be shown that Building Societies, for example through their 'red-lining' policies (developed they would argue in relation to their own concept of security of investment) have inhibited private investment in inner city residential areas. The issue is: are these kinds of determinants more important than those represented in urban models? To which we can add: would an analysis of these kinds of agents show that the predictions of urban models are analytically unsound?

It is in relation to the second issue that we can pick up various forms of 'alternative society' perspective. It may be argued from

such a viewpoint that the methods of spatial planning are all right in the terms of their original conception but that the basis has now shifted. The new viewpoints vary from the essentially physical and ecological concerns with resource availability and environmental quality, to a broader concern with the 'quality of life', which embraces environmental goals but is also concerned with equity topics. And yet somehow there is an apparent tendency for the concern with equity which comes from this direction to be 'above' conventional politics. It is also mixed up with a not very clearly articulated view that there is an alternative lifestyle which is superior. This can be 'taken' and adopted by those who can afford it - Californian dropouts or Highland crofter-immigrants for example - but which is also perhaps assumed without clear justification as a goal for all. The complication is that an active majority do not accept that alternative. Even this brief argument shows that the 'alternative' perspectives vary enormously.

There is also an important critique of modern analytical planning methods which has a more conventional basis and may be all the more powerful for that. This is the argument that the methods are not focussed on those aspects of urban systems which should be most important for planning. Harvey, for example, in the 'liberal' part of his book Social justice and the city argues for a stronger focus on 'real income'. This is to be interpreted as including measures of accessibilities to different kinds of opportunities and of the effects of various externalities as well as money income.

The third issue was that 'new' urban planners both operate with an ineffective picture of the political processes of which they are a part and also fail to take account of the political influence on what they see to be professional matters. There are many variants of this. Planners are sometimes accused of seeking 'value-free' solutions to problems when the political context makes this impossible (and indeed, undesirable). Or they are sometimes accused of imposing their own values on a population which may not share them. The central issue, however, is concerned with 'power'. It is obviously important to know more about power structures in relation to decisions about urban

development. This then relates very closely to the first issue: is it a consequence of existing power structures and relations that the form of urban development is determined largely by factors other than those represented in urban models? What are the implications of this for planning?

The fourth issue was, essentially: is there any evidence that the applications of new planning methods have made problems worse? Probably no-one is arguing that if this has happened, it has been deliberately engineered. So the nature of the charge is: are the new methods so bad in some respects, through the models not reflecting the main processes of change say, that their application will actually lead to problems becoming worse? We proceed by looking at two examples: the application of transport models, and the acceptance of the 'suburbanisation' solution for urban development.

A crude way of posing the question in relation to transport models and their application in the major conurbation studies is: did the studies create or support the urban motorway system and associated infrastructure, and if so and with hindsight was this unreasonable? It can fairly easily be argued that the models were used in an inadequate framework of cost-benefit analysis. For example, some goals were not adequately represented - the impact on environmental quality for instance. Indeed, in the early days before cost-benefit analysis, it can be argued that the main goal was the relief of congestion and that road building has not in fact solved this problem. (Though the question as to whether we are better off with congested motorways than no motorways at all is an interesting one.) It can also be argued that, through a crude belief in the consumers' surplus concept, the weights of the cost-benefit process were wrong: that what happened in the studies were that the 'relief of congestion' goals of the middle classes commuting to centre cities were met, while insufficient recognition was given to the accessibility problems (through urban form and through the run-down of the public transport systems) of those without cars. It could now be argued that this recognition could only have been achieved by giving more than unit weight to the costs (in 'real income' terms) of the non-car owners. But this is not an

argument against models so much as one for improvements in the surrounding planning processes. It can also be argued that the models have been significantly wrong: that predicted responses are likely to be wrong no matter how good the statistical fits in the base year if some of the underpinning relations are absent or wrong. This recent research needs to be incorporated in our view of best practice with models.

There is a stronger argument still from a Marxist perspective. This anticipates some of the discussion below, but is conveniently taken here while the example is in front of us. It can be argued that, because of some of the inherent tendencies in capitalist societies, such as the declining rate of profit, that there is always pressure from capital for more rapid circulation. The state 'supports' capital in this by appropriate forms of transport development; and transport modellers 'support' the state by using their models simply to extrapolate the status quo. It is also sometimes argued that a lively motor industry is essential to a capitalist economy and that this is another reason why the state, in supporting capital, supports more road building; and that transport planners have gone along with this because they have not recognised the underlying causes.

The second example referred to suburbanisation in its typical western form, and the questions to be put are: was there an alternative? And: if so, have planners missed it through inadequate methodology? The question arises from two or possibly three angles. It is often argued that suburban life has all sorts of problems associated with it and that there is, potentially, a better quality of life. This usually involves a return to 'communities' and is perceived by a usually-intellectual subset of the middle class who see themselves and the 'good life' as metropolitan (possibly with country cottage added) rather than suburban. It is part, in other words, of the second groups of attacks. It is not clear whether a majority of present suburban residents would share this view. A second angle is from the planning side: that there should be alternatives and that they can be designed. Unfortunately (if we forgive some oversimplification), it is this school which has generated, for example, high rise developments

in many locations. The successful alternative is not, therefore visible. The third angle on this question again involves our anticipating the Marxist viewpoint. There, one form of argument runs: the present form of western cities is a characteristic outcome of the nature of the capitalist mode of production in the late twentieth century. There are, therefore, alternatives to be had, but only by understanding at a deeper level than hitherto the causes of suburban development, and probably only by transforming the form of the mode of production in some substantial way. There is also a related argument, to which we shall return, about the extent to which those who live in the suburbs and report pleasure from the experience can be believed in relation to their 'consciousness' of the 'choices' they actually make. In summary, if this is a charge against planners, it turns on first, failure to understand the nature of suburbanisation; secondly a design failure to imagine alternative futures which are acceptable; or thirdly, failure to recognise that alternatives are doomed to failure because of the inherent lack of influence of planners on the main dimensions of capitalist development. As in the transport case, because insufficient depth of understanding is available, planners resort to models which are, in effect, trend projections and therefore by their nature support the status quo.

Although elements of the Marxist radical critique have crept into the argument above, most of it could have been conducted without the benefits of Marxist analysis. The next task therefore is to explore what can be added to the argument from a Marxist perspective. We will then be in a position, in the next section, to respond to the critique as foffered by both conventional and Marxist viewpoints and at that stage we will attempt to assess how much of the criticism to accept, the extent to which it matters, and the impact it ought to have on our future approaches to spatial planning methods, both in practice and in research.

The Marxist approach is, in fact, a broad multitude of possible approaches. They perhaps share some common characteristics, or modes of approach to analysis. What they offer, or claim to offer, relative to the conventional approach, is alternative underpinning

theory and, in some cases at least, deeper theory. Here we attempt to sketch some of the main ideas which may be found in such approaches.

In different Marxist approaches, different points will be emphasised. Here, we note a selection relating them as we go to the four issues discussed mostly in more conventional terms above.

The first focus of a Marxist analysis is likely to be the concept of a 'mode of production' and the notion that it has a distinctive dynamic which follows from the existence of a set of social relations necessarily engendered by it. A product of this kind of analysis of capitalism leads to the notion of class struggle and conflict as being one of the main agents of change and development. Capital has to respond to these conflicts and the crises which arise as a consequence of, for example the (predicted) falling rate of profit. There are a number of very interesting questions about the precise nature and distinctiveness of a mode of production and in particular about the nature of the transformations from one to another. It can be argued, for example, that Marx's own predictions of the transformation of capitalism to socialism have not worked out; but also that late twentieth century capitalism is very different from the nineteenth century version - and that it may even constitute a new mode.

Ironically, it seems to me, brought up in a different tradition, that these arguments smack of systems theory: the emphasis on the need to specify social relations between the components of the system of interest, and that the dynamical behaviour of the system follows from an analysis of these relations. Indeed, it can now be argued that Marx, in focussing on the transformations between different modes of production, anticipated, in essence, bifurcation theory! But more of that in another context elsewhere.

There are some consequences of this approach for urban analysis, and the best known example of its application in this way is in David Harvey's *Social justice and the city*. In the terms of this essay, its main immediate contribution relates to the notion of focussing on the main agents of the system, and the argument that urban modellers have failed to do this. It also has a number of other implications which are picked up in later Marxist' themes below.

A second kind of theme is concerned with the theory of the state. The Marxist argument is that a deeper understanding is needed, a deeper level theory, in order to understand what planning is and how (or whether) it can be effective. Most Marxist theorists see the state as necessary to resolve conflicts between classes and to serve a number of other functions, but all essentially in support of capital. At a fundamental level, it is argued that the state is needed to support the reproduction of labour and the circulation of capital for example, At the very least, it is argued that the role of the state is something more complicated than that of referee or arbitrator on behalf of the people as a whole. Scott has argued strongly, for instance, that planning practice must be seen in the light of an analysis of partisan role of the state. So this kind of theme has a major bearing on the third of our themes above which was concerned with political processes: a deeper understanding of the role of the state is needed so that the possibilities of planning can be better understood.

A third theme in Marxist analysis is concerned with change in a more direct way: to add to the kind of theory which can be sketched about the nature of modes of production and the state and to begin to make predictions about the forms of change. Traditional Marxist theory is often associated with the idea that the determinants of change lie in the economic base of society, and not in the superstructure (of which 'planning' would be a part). Marxist theorists from Engels onwards have qualified this crude 'economism' and have argued that, while this may be the prime determinant, changes in the superstructure can be important and can, in some circumstance, bring about transformations. But whatever the outcome of that particular argument, there is a consequence of this style of analysis which has to be taken on board by modellers. That is: that the way a society develops depends on relative power - whether in the representatives of capital in both the economic base and the superstructure; or, as is more likely in the greater complexity of late capitalism, in a complex of classes and sub-classes. These ideas can be useful theoretical developments (though an aggregate version of them may add up to something like traditional Marxism).

How does this bear on our earlier issues? First, it can be argued that if the power bases of a society are not understood, then planning in the name of problem solving is more likely, in the event to be in support of the most powerful groups; or at least failing to obtain and distribute resources in such a way that the problems of the less powerful groups are likely to be alleviated. This is almost certainly very near what has happened in the last twenty years. So if we return to the question about why the new methods have not resolved any of the obvious problems, then the answer probably is more to do with the nature of power balances than to techniques. It is possible, in these circumstances, that the new techniques have been used, unconsciously, to support the status quo, to reinforce it.

A fourth theme to pick out involves the possibility of alternative forms of society. Marx has always been seen as offering a particular alternative vision together with the argument that a socialist or communist state will necessarily follow from the crises of a capitalist one. Closer analysis, as authors like Miliband and Williams have shown, indicate that this is not the case. Further, when transformations have taken place, as in Eastern Europe, they have been to a form of state capitalism rather than socialism in any true sense. What this exposes is the need for hard thinking, and ultimately practice, about the question of what a truly socialist state would actually look like. There is a need to invent new kinds of institution.

Two more themes should be mentioned briefly. First, Marx was very concerned with the alienating effects of the capitalist mode of production and saw the need to return to human scales in some way. Miliband argued that there was a sense in which this kind of mission seemed more important to him than socialism, and that this may be one of the reasons why there is relatively little political argument in Marx. This also links closely to a difficult, and in some ways dangerous, notion of 'consciousness' (which was mentioned earlier in the discussion on the suburbs). It is possible to argue that the alienated worker is not conscious of his position and the alternatives. This is important because there may be many respects in which this

is true for all of us. It is dangerous because it is a very difficult thing to test and because it can then be used by a small minority to act politically 'on behalf of' an alienated majority without popular support. This is a knot which is difficult to untie. The implications for planning are clear, but as difficult to apply as in any other part of politics.

The second subsidiary theme to be picked up relates to method. Harvey, for example, argues that Marx's most important contribution is his use of the dialectical method because this facilitates the resolution of the contradictions which face the urban analyst continually. This seems to me the least important feature of Marx's work. It seems a reasonable conjecture that Marx, working in the nineteenth century, used the available tools of his research and, working in Germany, was influenced by Hegelian philosophy. If he had started work in Vienna in the thirties and completed his work in the United States in the sixties, it would not seem at all surprising to me if he had started out as a logical positivist and then added to this position from the tools of systems analysis! He could have produced essentially the same results in a different language.

A final remark as a preliminary to more formal responses: I am sure there is an immense amount to learn from a broadly Marxist perspective and the rest of this essay is written in this spirit. It also seems to be the case that many Marxist critics of planning methods use a particular technique which is worth a comment: they label those methods by particular characteristics - positivist, functionalist, instrumentalist, and so on. Unfortunately, they often misunderstand the methods they are criticising in this respect, and in some cases - 'positivist' being a notorious example - they misunderstand the label they are attaching, unsolicited, to other people's work. The technique can broadly be described as having a close affinity with that of setting up Aunt Sallys and knocking them down. We will try not to proceed in the same way!

5. Responses, prospects; towards a research programme

It is perhaps as well to begin with the defensive part of a response and to get it out of the way. Some of the criticism of the new methods has been directed against mathematical modelling as such. This is mistaken. Whatever the underlying base of theory, mathematical techniques are likely to be needed to handle the complexity which exists. They will also be needed within planning frameworks to guarantee that the most efficient solutions are found for achieving whatever goals are sought. Anything inefficient means that resources are being squandered. It can also be argued that some of the Marxists' attacks are mistaken, usually because of errors of interpretation arising from the use of different languages in different camps. It is nearly always a mistake to make an argument turn on language (and that one's own is the 'correct' one) since there are often alternatives, and the important thing is to discover what the real points of substance are. An example of this is the Marxist critique of the new planning technology as positivist and 'value-free'. 'Positivism' to me, for example, is a branch of philosophy concerned with the nature of verification and falsifiability. Its main use is to eliminate meaningless metaphysical statements. This does not imply that it cannot be concerned with value. It can be argued that values are determined by experience, and such experience is very much a matter for real empirical investigation. So the critique here is based on misunderstanding.

In the main, however, the defensive part of the response is a very mild one. By way of summarising the other side, we can return to the main heads of the critique and note the extent to which it has to be accepted. First, it is likely that some 'main agents' have been neglected. Secondly, insufficient attention has been paid to measuring planning-sensitive notions like 'real income'. Thirdly, insufficient attention has been paid to the political processes of which planning is a part. Fourthly, it may well be that because of combinations of errors arising out of the first three heads, some problems have been made worse. So much has to be done to rectify deficiencies. We tackle this first by summarising the prospects for

urban modelling in particular, and then by discussing some of the issues in more detail as a framework for ongoing research.

The first point to argue strongly is that there are many well-defined planning problems for which mathematical modelling and associated planning techniques are eminently suitable. These would include, for example, the spatial planning of major public services. Examples are, currently, the health and education services, both of which are subject to (different) demographic pressures at a time when public resources are not easily available for appropriate reorganisation. And yet something will have to be done. Secondly, many of the models are open to substantial improvement. If theories can be well stated about the influences of new agents, then these can be included. If the new information does not lend itself to mathematical form, then new 'hybrid' models and theories will have to be developed for analysis and for use in planning. Thirdly, it can be argued that modellers are at the point of major breakthrough in their understanding of the broad mechanisms of evolution of urban structure. This is particularly important in relation to many past criticisms, because much has been made of the fact that most operational models are 'not dynamic' (in contrast, supposedly say, to a Marxist approach). The new 'evolutionary' models are explicitly dynamic. They can be constructed now using new techniques from applied mathematics which have only become recently available. It should then be said that one consequence of these advances is that it makes it more clear than ever how difficult prediction is. This does mean that the traditional mode of use of models in planning may shift from a concern with forecasting to one which focusses on the analysis of stability and resilience.

What does all this add up to in terms of research priorities? First, it should be possible to mount a number of effective demonstration projects in the well-defined areas where the new planning technology can make obvious contributions. It would be particularly helpful if this could be combined with another programme of central-government lead research on the linking of research products with planning practice, and on the creation of environments within

planning agencies which were capable of using the new technology most effectively. This can be summarised as 'good demonstrations' plus 'best-practice research'.

Secondly, effort could be put into an assessment of detailed criticisms of models (with much more detail than has been possible in this broad essay) with a view to exploring how the results of such investigations can be incorporated into models or alternative hybrid instruments of analysis. This would involve dealing with currently missing main 'agents', 'processes' which are not built in, power structures, the effective processes for the distribution and redistribution of 'real income' and so on. In many of these cases, the differences between traditional approaches and new ones turn not so much on whether there are algebraic equations or not, but on the interpretation of key terms, and decisions about which are 'driving terms' and so on. (For example, Leontief vs. Straffa; Keynes vs. Freidman.)

Thirdly, a programme of fundamental research should be encouraged which builds on current breakthroughs in the understanding of the evolution of urban spatial structure.

Fourthly, urban modellers should be more explicitly connected to the existing research programme on the theory of the state and the associated political processes. Modelling and this kind of research into politics should not be seen as separate and clashing fields.

A general comment can usefully be made which affects a number of the above research proposals. Urban analysts should be prepared to take on the radical critique in its own terms. There are a number of reasons for this. First, because it is important that major critiques be responded to; secondly, many radical practitioners are not going to operate in the language of modelling, and it is probably easier for modellers to attempt the reverse process; thirdly, syntheses are nearly always fruitful.

With these proposals, and with this comment in mind, we can now identify a fifth area of research, and one of the most important. This could be called 'issues' research. It involves a direct

attack on issues and possible policies. Sometimes, the new planning technology will be relevant to this; but often, as Harvey points out in a telling passage, we *do know* what the problems are without carrying out any more factor analyses or model runs. We have seen as part of the above argument that the reason why progress has not been made in many cases is essentially political and not technical. In a programme of 'issues' research, this could be pointed out forcefully. Here perhaps lies the answer to civil servants, and occasionally politicians, who are continually seeking research which is relevant to short-run policy issues. Often, they seek this because they are not prepared to face the deep political nature of the problems under discussion. We can use the fruits of our present knowledge to make clear what the options are and the nature of the political choices which are involved. If and when major changes of direction are made, or resources rather than lip service are made available, then the planning technology will often be available to proceed in an efficient manner.