

MODULE 2.2

QUESTIONS OF ONTOLOGY: SPACE AND TIME IN HUMAN GEOGRAPHY

Space

Three different conceptualizations of space have dominated the practice of human geography as a field of study: space as absolute; space as relative; and space as relational. Each has dominated a particular phase in the sub-discipline's history. The notion of space as absolute characterized the period before the SQR; the SQR was dominated by a conception of space as relative, though conceptions of space as absolute were also present; the socialization of the sub-discipline subsequent to the SQR led to more relational views of space which, in turn, helped one understand why in fact at various times and places, space might have been conceived as absolute or as relative.

Absolute Space and Human Geography

Abstractly understood, if space is defined as absolute, then it is seen as having an existence independent of the existence of any material objects in it. It is conceived as an external coordinate of material things and relations, an unchanging box or container for events and processes. When the spatial tradition was relatively subdued in the pre-SQR period, when the environmental and regional traditions were more dominant, this was the conception of space that was assumed, knowingly or not. This was the view implicit in Hartshorne. For him, geography was about map comparison in an attempt to interpret the associations of objects relative to each other over space; e.g. a comparison of the geological map with the building materials used in different places in pre-modern times. This idea of areal association, also evident in environmental work, simply drew upon space as a set of coordinates: events had the same locations vis-à-vis lines of longitude and latitude, for otherwise, how could they correspond in their locations with respect to each other? Space, in other words, was seen as having a structure which could be used to locate things. Space was viewed, in short, as a container.

Relative Space and Human Geography

The SQR placed its emphasis elsewhere: space as relative. Space was now defined as distances between material objects, accessibilities with respect to particular cities, distances between

points of production and markets, the directions in which people moved – towards the CBD or away from it, for example. It was these distances, accessibilities that were seen as related to the locations of material objects, as in the relation between population density and distance from the CBD. Nevertheless, for various reasons the adoption of a relative view of space remained very partial. The idea of space as absolute, as having an existence outside of material objects, as exerting an influence on those objects, including the location of firms, people, and the like, remained a stubborn one. People talked, for example, about the influence of distance or simply of space on human activities and their geographies. ‘Distance’ appeared as an independent variable in regression equations. For sure, it was always measured as ‘distance from some object,’ like a city, but the subsequent regression coefficient was seen as a measure of ‘the effect of distance.’ One might claim that this separation of space from substance was simply a shorthand for talking about relative location, but it was a dangerous shorthand. Furthermore, it said something about the preoccupations of geographers and their professional insecurities at the time. Many human geographers at least, *wanted* to see space as something separate since it gave them something over which they could claim an expert knowledge independent of the other social sciences. This is one of the reasons why Bunge’s *Theoretical Geography* had the impact it did. The seeming separation of space from material reality, moreover, allowed a spatial determinism to creep into arguments. Some critics complained that one form of determinism – the environmental – had been forsaken simply for another, the spatial.

The concept of space as relative was present but it was only weakly developed and allowed ideas of absolute space to creep back in – again, perhaps because that was what human geographers wanted. A stronger relative concept of space would have recognized that space only existed because objects exist, have various properties, and relate to one another in various spatial arrangements. It was not intervening distance that was important, therefore, but the nature of the surface over which people moved and the way it required energy if people were to so move. This was partially grasped through the idea of the *friction* of distance, but only partially. We will pick up on these arguments later when we review Sayer’s work on ‘the difference that space makes’ as he entitled his paper.

Relational Concepts of Space

The emergence in human geography of a more relational conception of space corresponds to the increasing awareness of the role of the social in human geography, including the ways in which space is conceptualized. It was in the early 'seventies, therefore, that a relational conception first puts in an appearance in the work of David Harvey.¹ This also corresponds to a change in the question being asked of space. As he states: "The question "What is space?" is ... replaced by the question "how is it that different human practices create and make use of distinctive conceptualizations of space?"" (*Social Justice and the City*: 13-14). The emphasis now is on the way in which particular forms of society create particular spaces, particular geographic arrangements, along with particular forms of consciousness and discourse about space. As Harvey points out: "The movement of people, goods and services and information takes place in a relative space because it takes money, time, energy and the like, to overcome the friction of distance." (p.14) In other words, relative space is a conception appropriate to a society in which commodity exchange comes to dominate production. Concepts of space, therefore, are a result of human practice, and human practice is always socially structured. It is in terms of the social process and its different aspects, material, symbolic, discursive, and the other aspects of the social process that we discussed in the last module about people and society, that ideas about space are to be understood. Conceptions of space are necessarily related to, entailed by, particular forms of society.

For example: How else are we to understand many of the ideas about space that we draw on in our everyday lives and make (practical) use of? We make sharp distinctions, for example, between workplace and living place and take them for granted. They are inscribed, however, in a particular way of life. It is unlikely that prior to factory production people drew such differences between working and living (think about that one: we aren't living when we are working!). Rather work would have been carried on within or from the home, and in the fields there would have been no discipline to enforce when one started working, broke off for a nap, to have lunch, talk with neighbors and so on, other, that is, than the desire to feed oneself and one's family. This is, furthermore, not just a spatial distinction but a time distinction: a time-space distinction, in

¹ See in particular pp.13-14 of his *Social Justice and the City* (1973).

other words. As Harvey points out in the *Annals* paper of his that you have read, the material difference between worktime and leisure time, workplace and living place, was the outcome of sharp conflicts and contestations. Getting workers to be punctual was a problem for employers in the early years of capitalism. And getting them into the factory to begin with presupposed waves of dispossession forcing them into lives of wage labor.

We can think along similar lines about the symbolic qualities of places and how these are associated with material distinctions that would be hard to contemplate outside of a particular mode of (social) production. In metropolitan areas we are accustomed to the hierarchy of places, the inner city vs. the suburb, the gentrifying neighborhood vs. the ‘deteriorating’ one, the ‘respectable’ working class neighborhood vs. the ‘slum’ and so on. These distinctions are tied into the relative worth we characteristically accord different people in a capitalist society, and we accord them for good reason. It is, after all, a mode of production which *needs* to stigmatize unemployment and to value competitive success in labor markets and therefore housing markets, for how otherwise, could it reproduce itself? Imagine a world in which competition for jobs and ‘better’ housing and ‘better’ neighborhoods was defined as demeaning, as a waste of good time; or a world in which to be unemployed was to be out-of-luck, simply unfortunate, not having had the privileges of the children of the wealthy, rather than idle, a welfare scrounger who needs to be kept at a level which will encourage him/her into the labor market so as to keep wage levels down.

The idea of space as separate from the material world, from substance, is also something that is very characteristic of modern consciousness, and not just of that generation of human geographers that came of age during the SQR. The idea that space could be causal in and of itself without any material objects seems, in hindsight at least, difficult to defend. So one question that this poses is why did we ever conceive of space as, as Harvey puts it, 'a-thing-in-itself'? This is an idea, moreover, that also applies to ones about time. Like space, time is typically defined as empty, waiting to be filled. It exists separately from substance and activity, therefore, for how otherwise could it be ‘empty’?

Time, like space, is an ahistoric concept, but what it has meant has varied, as is the degree to which, *as a concept*, it has been separated out from substance. All peoples, throughout history, have had a concept of time as an aspect of diverse activities and processes. According to Aristotle and Marx, it is change that is the condition for time.² Obviously it is the changes that are important to us as human beings that we have used as our various measures of time. Different natural processes have different rates of change and the abstraction of time allows us to compare those different rates of change: the time from gestation to birth for different domesticated animals, the time from planting to harvest for different crops, etc. This implies no separation of time from substance: merely a means of calculating when the ground will be ready for another crop or livestock will be ready for another litter, when we might expect birth to occur.

But under capitalism it can be argued that time gets separated from substance creating the idea of *empty time*; as time existing independently of substance. Anthony Giddens is especially useful on this (*Contemporary Critique of Historical Materialism*, pp.130-135). He also talks about the separation of time from space. I am going to quote him at length:

"...time, as a separable 'dimension' of human life, intersecting with the 'substance' of human activities as situated in a separable 'space', is focal to the organization of capitalistic production. When we say 'time is money', when we refer to 'spending time', etc., these phrases mean more than the commonplace that time, for human beings with a finite life-span, is a scarce resource. The commodification of time is the underlying connecting link between the massive expansion of the commodity form in the production of goods, on the one hand, and the commodification of labor (as labor power) on the other. The commodification of time means that time is drawn into the 'double existence' which is the predicating quality of every commodity. Time as lived time, as the substance of the lived experience ... of Being, becomes accompanied by the separated dimension of time as pure or 'formless duration'. With the expansion of capitalism, this is what time seems to be, just as money seems to be the universal standard of value of all things. Time as pure duration, as disconnected from the materiality of experience, comes to be

² For Marx it is labor that introduces time in to the world. This is because the labor process integrates the three constituents of time -- past, present and future. In labor we take something that already exists, that has a past, and we work on it (i.e. the present) with an eye to transforming it into something else (i.e. the future).

perceived, in direct opposition to the actual state of things, as real, 'objective' time, because like money it is expressed in a universal and public mode ... In non-capitalist societies of all sorts, the classification of time socially is never separated from the substance of social activities ... One indication of the unusual nature of the isolation of time as measurable duration, and its differentiation from space, is to be found in linguistics. According to Tuan, of the three terms 'time', 'space' and 'place' ... only the third can be translated into most non-European languages without difficulty. This conforms to what Evans-Pritchard has to say in his famous discussion of Nuer time-reckoning ... For the Nuer, the year is the longest unit of time-reckoning; they speak of last year, this and next year, but otherwise time is calculated by reference to significant events" (pp.130-131).

In other words, the sense of time as objective, as something separate from the material world, comes with capitalism. There is a long explanation of this which requires a detour through Marx's theory of value, though the extract from Giddens above states the argument fairly well. But for our purposes here the following will suffice:

- a) under capitalism the goal becomes the production of value in the form of money regardless of the particular substantive form of that value: cars, TVs, etc. Whatever is profitable gets produced and people stop producing what is not profitable. Value gets separated from objects and assumes a life of its own in the form of money.
- b) the efficient management of time is crucial to capitalist competition: again, regardless of what is being produced. Commodities take time to be produced and the capitalist is indifferent to how the labor time at his disposal is used so long as it is used profitably: one commodity is as good as another, but time is money. Capitalists engage in a continual struggle to reduce the time it takes to produce something relative to the costs of producing it: i.e. time is a crucial part of the calculus through which firms increase their net revenues. Hence also the interest in clock time, punctuality, eliminating wasted time during the workday, and extending the time of the workday.

The same logic of efficient management also applies to space since spatial barriers require time for their transcendence. This is, again, time in which commodities could be produced. Hence the

emergence of such 'inventions' as the factory, the industrial district, and the city: inventions which mobilize the useful properties of spatial arrangement.

The same splitting off, the same abstraction, of space from substance is also apparent when we turn from distance as a feature of space to the specific locations for particular activities. Locations have different use values -- at any one time some are good for agriculture, some for residential, some for office buildings, etc. -- but as commodities they all get equated one with another according to the values that can be realized in those different activities; i.e. a rent geography. There is, however, no *necessary* relation between these locations and different uses. We all recognize how some change in transportation or the technology of production can change the comparative advantages of different locations. This is a view of space as inherently empty, as something which can be filled with different things but by other things at other times. Spaces, in other words, are separable from the uses to which they are put. Whatever maximizes the rent gets the space.

Under capitalism, therefore, we relate to space very differently than under other modes of production. The relation between space and activity is inherently indifferent. The same rules of (time-)space management apply to the production of apples as running an office (hence time and motion studies). Likewise the relation between particular locations and the activities going on there is contingent: the qualities of the land can be changed in various ways, changes in location relations alter the activities it is best suited for, the changing rent surface filters in some activities and filters others out.

Space and Geography's Position in the Academic Division of Labor

We have seen that the status of space has always been a concern among human geographers. For Hartshorne it was what made geography 'exceptional'; as limited in its ability to develop law-like statements like other sciences. In a crisis of self-doubt, this gave way in the SQR to the idea of space as having powers of its own, as the geographer's 'variable' and contribution to the understanding of social life. The critique of space as separate from society, however, that characterized human geography in the 'seventies and into the 'eighties led to further self-doubts.

If indeed, as those who subscribed to a relational view of space claimed, space and society were necessarily linked together, what did this imply regarding the ability of human geography to develop theory as opposed to simply applying to the understanding of geography, understandings coming from elsewhere in social theory. It was pointed out, for example, that the great names in social theory, people like Durkheim, Marx and Weber, actually had very little to say about geography, made little in the way of geographic assumptions and yet were able to turn out claims attracting a good deal of positive attention. So could geography be ignored when theorizing society? Was geography merely to be consigned to applying social theory to interpreting particular human geographies? One result of these concerns was a book edited by Derek Gregory and John Urry that appeared in 1985 under the title *Social Relations and Spatial Structures*.³ Numerous of the papers there are concerned with the space-society question, as indeed was a journal – *Environment and Planning D: Society and Space* – which had been founded two years earlier. In this section of the Module I want to briefly review the contributions of two people to that collection: David Harvey and Andrew Sayer, and the very contrasting conclusions that they came to.

1. Andrew Sayer and ‘The Difference that Space Makes’

Sayer’s chapter was entitled ‘The Difference that Space Makes.’ His conclusion, insofar as it bore on the question of whether human geography had an essential contribution to make to social theory, was pessimistic. The neglect of space by social theory, as in Marx, he says, is largely justified as far as more abstract work is concerned, and it is abstract work where theoretical claims are made. It is a different matter with respect to concrete research. His paper is also useful, however, for understanding what is at stake in the debate about absolute vs. relative conceptions of space.

The idea of absolute space, he starts out by saying, is meaningless. Since absolute space is assumed to exist outside of material things, it is nothing, and by definition, nothing cannot exist. Distance cannot exert friction; only substances can. Likewise, and accordingly, connectivity

³ This is an excellent book, and worth having in the library of any human geographer. It is not in print anymore but surely available through Amazon.

depends on the configuration of highways with respect to each other. If space does not exist as a thing in itself then spatial determinism has to be rejected. Advocates of relative space, on the other hand, recognize that space is constituted by objects. Without objects there is no space. Relative space, however, is not reducible to those objects and their particular properties: the properties of the different surfaces over which things are transported, for example – land, water, through the air. Spatial arrangement, where different objects are with respect to each other, matters. This is ‘the difference that space makes.’ Thus spatial arrangement affects whether or not the causal properties of things – their powers, their liabilities – are activated and when they are activated, what the effects are. So, for example, gunpowder is liable to explode when placed in contact – i.e. the role of spatial arrangement – with a naked flame. The effects of the subsequent explosion depend again on spatial arrangements. The effect will be more devastating in a city than in the desert, which is why nuclear tests were held in the latter rather than in the former.

Sayer expresses all this in the language of critical realism, but the ideas are quite straightforward. Social objects like waged workers or capitalists have particular (causal) powers and liabilities. Capitalists have the power to hire and fire, but are also liable to bankruptcy. Workers have the power to enter into contracts with whomsoever is willing to employ them, but they are also liable to unemployment. For the capitalist’s part, avoiding bankruptcy means employing wage workers, but that means being accessible to them; i.e. the importance of spatial arrangement. We take that for granted today for the most part: employers locate in or close to cities. But in the nineteenth century that was not always possible. Coal companies built company housing, for example, in order to attract workers. Likewise what the effect of that spatial arrangement will be – the coming together of money capital and wage workers – depends on how much labor is required and how many wage workers there are: the spatial arrangement that is a local labor market. Too few workers *there* means higher wages and too many (from the worker’s standpoint) means lower wages.

People, firms, in other words, exploit relations of proximity and separation in order to achieve useful effects. Firms get close to labor because it facilitates their profitability. More affluent households segregate themselves from the less affluent in order to reduce their tax bills, in order to establish a particular social milieu for their children, in order, in brief, to share out what have been called their 'positive externalities.' This highlights the fact that social objects like firms, wage workers, state agencies, etc., have causal properties which are in part spatial. There are needs and wants and powers that are spatial in character. People need space for their living arrangements. Firms need space for their factories. State agencies need space for highways, parks and schools. Regional malls need to be accessible to large retail markets. Workers need to be accessible to places of work. Capitalists can disinvest from one location and invest in another. Workers can move around in search of jobs. So does this mean that social theory has to be spatial? Sayer is pessimistic. Abstract social theory must indeed incorporate space to the extent that the necessary (causal) properties of objects are concerned – properties that they have in virtue of their nature or structure. But, he says, and quite crucially, this doesn't amount to very much: "To observe that capital must be accessible to property-less workers says very little about the actual spatial form of labor markets, which of course is not surprising, given the contingent nature of this form" (p.54). People, firms, have needs for space, for access, needs for particular spatial configurations as in just-in-time -- but a wide variety of spatial arrangements can satisfy these needs. Likewise the various (spatial) powers people have, like those of mobility, calculating distances, devising routes, can be expressed in all manner of spatial arrangements. The spatial properties of objects, therefore, were of such a general character that they couldn't tell us much about the concrete forms of geographies. In consequence social theory could proceed for the most part as if the world was spaceless.

The conclusion was not something most human geographers felt happy about. This was because it seemed to deny them the possibility of a role in the development of theory. Geographers would use the theories of others and apply them in particular spatial contexts. In terms of the politics of the academic division of labor this was not a bright prospect. 'Theory' has always had associations that seemingly rank its practitioners above those who toil away in the field or who grapple with what some have called 'ground level reality.' So Sayer's conclusions seemed a

blow to the long term project of raising human geography's ranking in the academic pecking order.

Before moving on to Harvey, however, one might construct an argument according to which the spatial aspects of people's causal properties *do* make a difference to our understanding of human geographies. Moreover, to say that because they don't shed light on actual empirical geographies is no reason to ignore them in theorizing. Social theory necessarily works at a high level of abstraction. It isn't just that it provides limited explanatory purchase on concrete geographies, it can provide only limited explanatory purchase on concrete social patterns, period. A theoretical understanding of the family will only take us so far in understanding (e.g.) the way it varies across ethnicities, nationalities, or social strata. I think, however, that more is at stake here. As we will now see, Harvey's approach to this question is quite different.

2. Harvey and 'The Geopolitics of Capitalism'

In the same book that Sayer's paper appeared in, there was one by David Harvey entitled 'The Geopolitics of Capitalism.' In that paper the meaning of what it means to adopt a relational view of space becomes more apparent. Space, tensions induced by the way in which space is used, now appear as indissolubly linked to the existence of particular social relations of production and the social dynamic that they entail. Thus, on the one hand, he argues, capitalism strives to mould geographies to its own needs of accumulation: to abolish space with time so as to speed up the rotation of capital through the construction of highways, railroads, electricity grids, pipelines and the like; and to exploit the productive advantages of scale through the construction of concentrated physical infrastructures C cities, factories, airports, dock facilities. At the same time it creates a geography of social infrastructures. These include the governance systems through which risk can be reduced, exchange lubricated and labor relations stabilized. As production concentrates geographically so its division of labor can be deepened. Vertical disintegration occurs and constellations of interrelated firms come into being to constitute territorial production complexes. In short, in order to valorize itself some fraction of capital has to be invested in fixed facilities of long life. Social infrastructures also have to be formed and these have their own

forms of fixity owing to the substantial opportunity costs of relocation that they impose, both for firms and for workers.

But, and on the other hand, once appropriated in the money form capital is free to roam the world in search of profitable investment opportunities. There is no guarantee that it will continue to flow through existing fixed facilities and social infrastructures and so allow their amortization. Rather it may be embodied in *new* factories, cities, physical infrastructures elsewhere in ‘new’ industrial spaces or ‘newly’ industrializing countries which offer competitive advantages over the ‘old’ – what become, in other words, the various rustbelts and inner cities of the world. And in order to facilitate production in these ‘new industrial spaces’ new social infrastructures come into being: new ways through which firms relate one to another and to their workforces and which may provide further competitive advantages.

The upshot of this is a competition over space between those who have stakes in the reproduction of existing agglomerations of fixed capital and their associated social infrastructures. Each tries to ensure that if there is to be devaluation of fixed capital and the imposition of opportunity costs as firms and workers are forced to forsake the advantages provided them by their localized social relations then it should be someplace else. Place-based coalitions, often cross-class in character, emerge to defend what Harvey calls elsewhere ‘territorial structured coherences.’ This they try to do in the only way possible: by guaranteeing a continuing flow of value through local social relations C attracting inward investment, lobbying the state for new investments that will fortify existing advantages or for some sort of regulatory relief and the like. In this way capitalism generates what Harvey called its geopolitics.

In sum capital seeks to subordinate geography to its own logic of expanded reproduction or accumulation (much as it seeks to subordinate technology, the state, the family and not least the working class) and it certainly achieves a degree of success in this regard. But at the same time it must, of necessity, revolutionize geography. It must develop new transportation and communication technologies, new products which may shift the balance of advantage between one place and another or result in the creation of entirely new industrial spaces elsewhere. In

consequence it invariably creates tensions between fixity and mobility and therefore between the old and the new and between here and there. Capital differentiates itself, not least geographically, in order to solve its contradictions but this results in a re-posing of the contradiction in a new concrete form.

Central to Harvey's attempt to develop our understanding of the changing historical geography of capital, therefore, has been the contradiction between fixity and mobility. In order to be produced some fraction of capital must be immobilized in fixed forms. But once produced there is no guarantee that it will continue to flow through those fixed forms and permit their amortization. Alternatively the retrieval of the value embodied in those fixed forms depends less on the circulation of capital and more on that of revenues. But the principle is the same.

What does this say, however, about the relation between human geography and social theory? Does social theory need to take space into account? Was Sayer wrong and, if so, why was he wrong? What were the errors in his argument? Here it is useful to recall the discussion from the last Module (2.1.1) regarding Harvey's view of the social process. He made two important points. The first was that any social process had six different aspects or moments; the discursive, the material, the cooperative, the moment of power, the institutional, and the imaginary. The second point he made was the way in which these different aspects incorporated each other; how, for example, the division of labor inevitably had a power aspect, was institutionalized in various ways through rules governing it, how it mediated our material relations with nature, and so on. Oddly he omitted the spatial from his list of essential aspects of the social process, but that is easily inserted and is certainly called for in the light of Harvey's emphases elsewhere. For sure any social relations are spatial in character and require appropriate spatial configurations if they are to be realized. So, and a major conclusion from Harvey: Space *has* to be taken into account in theorizing social life, but society has to be theorized as a whole. This means that geographers require an immersion in social theory that would otherwise not have been required. They bring particular sensitivities, a spatial sensitivity and awareness above all, to the task but the idea of spatial theory as opposed to social theory is a non-starter.

From Space To Space-Time

Harvey talks about the social process and its necessary spatial conditions: how, for example, under capitalism, capital and labor have to settle in particular places, how physical infrastructures, housing, lines of transportation, etc., have to be built if production is to occur. But talk about processes, settling, invokes time as well as space. Locations occur at particular points in both time and space. Instead of talking about space, therefore, perhaps more logically we should be talking about space-time? We should also note at this point the close relation between time and space: movement over space takes time; location choices are often made in order to economize on time, as in residential choices or firms that use just-in-time production systems.

Time as a coordinate of human geographies has always been present in the sub-discipline. Historical geography has a long history as a branch of the sub-field. Changes in human geographies were documented through cross-sections in time as in (e.g.) the geography of Roman Britain / the Domesday book / the Middle Ages / the Industrial Revolution, etc. Just as space was seen in absolute terms, as a container, however, so too was time. Concepts of time as absolute dominated. The SQR, on the other hand, modeled human geography as if time did not exist. Equilibrium solutions dominated. Any deviation away from a spatial equilibrium would automatically elicit counteracting changes that would lead to its re-establishment. Migration, for example, was interpreted in such terms. People moved away from low wage to high wage areas until wages were equal (allowing for the costs of movement between them) between them. To the extent that the equilibrium was disturbed, then new movements would occur in order to re-create wage equality (allowing for movement costs) between the regions.

Not all work carried out under the aegis of the SQR was of this timeless sort. The work of Les Curry on the random space economy is of particular and lasting interest here. Treating events, locations as probabilistic rather than, as in spatial equilibrium models, as deterministic, Curry showed how particular geographies are only *possible* and not necessary outcomes: the underlying process could have produced other results. In making this argument he drew on the work of, among others, a contemporary, Torsten Hagerstrand. Hagerstrand's work on spatial diffusion

was of particular interest to Curry, though his work on migration points in the same direction: how the human geographies we observe – of migration, of diffusion, etc. – are only one possibility among many, and how contingency plays an important role in what happens.

In studying the diffusion of agricultural innovations, Hagerstrand had noted that later adopters tended to cluster around earlier adopters. He theorized that this was due to the greater likelihood of contact between farmers over shorter distances and that in the course of contact, knowledge of the innovation, its advantages, would be communicated. But he noted, contact between any two farmers living close together was likely rather than inevitable. Probabilities could be attached to these likelihoods and diffusion modeled on that assumption. The technique he used was Monte Carlo simulation and every time the model was run, the pattern of innovation diffusion would change testifying to the role of chance factors that could not, by definition, be incorporated into the model. Hagerstrand also studied migration flows using a similar approach. He was particularly interested in flows that revealed strong directional bias – why is it (e.g.) that Columbus has a relatively large population from the Horn of Africa but neighboring cities of similar size don't? He argued that initial movements from an origin to a destination had a chance element about them, but that later migrants would follow on the basis of information channeled back, the presence of someone who could help them find jobs and housing, etc. In other words, instead of the negative feedbacks that bring about equilibrium in location theory, here positive feedbacks simply accentuate a tendency. Today we define this sort of development as *path-dependent*.⁴ For further material on this see the Appendix.

Throughout the 'seventies, the tendency in human geography was to move away from the timeless understandings of location theory and the SQR. Transformation of space over longer time periods than what was characteristic of work under the SQR became of increased interest. To some degree, however, an interest in process over time tended to marginalize interest in spatial variation. Marxist geography encouraged an interest in general *tendencies* like urbanization, suburbanization, colonialism, imperialism and the development of metropole-dependency relations. The particularities of geography underwent some eclipse. This only ended

⁴ Hagerstrand was also responsible for another, more direct, attempt to think in terms of space-time. This was his so-called *time-geography*. See the entry in *The Dictionary of Human Geography*.

when David Harvey, at the beginning of the 1980s, laid out in his book *The Limits to Capital* (1982), and in his paper on the geopolitics of capitalism (see above), how capital formed places as well as spaces and how this, along with the tensions between space and place, was a necessary feature of its logic. Geography, according to Harvey, had to be theorized as *historical* geography, with an emphasis on the ever changing, albeit structured, tension ridden, nature of human geographies. Geography, in other words, had to be about both space *and* time. Locations (of factories, people, new real estate developments, etc.) were always space-time events and not just located in space.

Harvey's vision can be usefully set beside Massey's somewhat different take on space-time. She starts out from the observation that spatial variation is often thought of in terms of temporality or sequence. Spatial difference, she argues, frequently tends to get re-ordered into temporal sequence. Places are conceptualized, certain of their attributes selected out, in ways that fit some temporal ordering. For example: There is the common distinction between more developed and less developed countries. The implication of this distinction is that what more developed countries have experienced – higher levels of development – will be what less developed countries will experience as they 'develop'. In similar fashion, emphasizing some inevitable change over time, places get 'normalized.' Subsequent to the ending of apartheid in South Africa, for instance, people talk about South African urban geographies getting 'normalized', by which they mean some shift towards the North American pattern of poor inner cities and affluent suburbs. Notions of globalization imply a similar view of places as existing on, and moving along, a continuum. In that instance it is a continuum of more or less integration into the global economy, the assumption being that those that are less integrated now will soon be more integrated.

She is critical of these conceptions partly because of the way they marginalize the many, many differences between places in favor of selecting those that can provide some ordering over time; and also because of the way such a conception closes off openness to change. This view of the future as closed to alternatives is, she argues, thoroughly political. The idea of 'the less developed countries' was hatched in the 'more developed countries.' It suits their purposes, their

interest in continuing accumulation, to invoke a world in which development is the norm. Only thus will 'less developed' countries be interested in opening up their economies to the trading and investment initiatives of the corporations of North America, Western Europe and Japan. Rather she wants to see space not in terms of the temporal ordering of particular places but as the sphere of multiplicity; as the source of diverse differences which, through movements, overlaps, get juxtaposed in particular places and are the source of change there; changes that cannot be anticipated and which underline the way in which the future is open and not closed.

This is the emphasis on space-time juxtapositions that we discussed earlier in Module 1.3 on the spatial tradition. According to this view it is not spatial ordering or temporal ordering that is important to understanding geographic change but spatio-temporal ordering: the juxtaposition of particular firms, a major university in the Silicon Valley area, for example, as the basis for the emergence of a new industrial area. New ideas about how to organize economic life emerge and then get applied experimentally in particular places: the ideas underpinning neo-liberal economic policy first saw the light of day at the University of Chicago and, quite fortuitously, found a welcome in mid-'seventies Chile. For reasons having to do with the disposition of political forces in Chile at that time, the experiment worked; which helps explain its subsequent adoption in Britain and the US by firms and states looking for new ways of re-establishing profitability in the context of the long downturn in business conditions that set in in the early 'seventies.

Places and the people in them, therefore, are open to the future. The future is not closed. Or is it? Particular ways of doing things, of organizing economic and political life, emerge in particular places at particular times and can be understood in terms of a juxtaposition of conditions. One might argue that this is to ignore the conditions under which these new ideas are pursued and get adopted. Is it not the case, for example, that ideas get developed, adopted, because they facilitate capital accumulation and that firms are pressed to do that as a result of the production relations – capitalism – under which they operate? Massey might retort that one of the changes that might indeed take place in particular places or countries, is the transformation of those production relations; that what might come together in a particular place are conditions that facilitate the displacement of capitalism. Well, perhaps. But we should also recognize that some things are

harder to change than others. Compared to changing production systems, creating new niches in the social division of labor, new modes of organizing labor relations, revolutionizing the production relations into which people enter – moving beyond capitalism, in particular – is unlikely to be that easy.

Appendix

Storper's paper⁵ on time-dependent processes picks up on some of the same themes as Curry's paper but was published thirty years later. Accordingly it reflects a different context of ideas even though there is considerable overlap in basic concerns: how small scale events (expressed as probabilities in the Curry case) constitute or go to form large processes. In fact both Curry and Storper overlap somewhat in one of their examples: Curry talks about the development of the manufacturing belt while Storper is interested in the development of regional growth complexes. Note also that many of the ideas presented in the Storper paper are ones that are argued out in more concrete and readily understandable terms in the book he wrote with Richard Walker (*The Capitalist Imperative*).

Unlike Curry, Storper's *explicit* focus is time and how we incorporate it into our explanations. He argues that current social science models are timeless. It is important to be clear what he means by this. Specifically they are timeless in two distinct senses both having to do with the concrete nature of events. On the one hand explanations can't handle the specific concrete nature of the events they try to explain or the sequences of concrete events. Thus marxism is good at explaining the development of the productive forces -- the role of competition, for example, as a stimulus to technical innovation -- but not the emergence and subsequent development of the particular industries / regions that are the concrete vehicles for the development of the productive capabilities of human beings. Likewise it is not of much use in helping us understand specific sequences of events like those that led to Silicon Valley: the role of David Packard, federal orders for equipment, the role of Stanford University, perhaps particular planning decisions by San Jose municipality, etc.

⁵ "Big Structures, Small Events, and Large Processes in Economic Geography," *Environment and Planning A* 20 (1988), 165-185.

In order to break this impasse he makes some defensible assertions:

- i) Small events are the outcomes of structured, but not fully determined, situations: 'structured but not fully determined' since they are the results of choices and strategies undertaken within structured circumstances. In other words, what Henry Ford did was not determined by the structure of capitalism though his actions (buying and selling, for example) aren't comprehensible outside of those structures
- ii) Sequences of these small events produce large processes and the large outcomes of small events may not be fully predictable from the events themselves. For example, and referring back to the earlier discussion of Hagerstrand, the fact that a city becomes the destination for migrants from a particular area could not be predicted from the variety of circumstances that brought the initial wave of migrants from that place to that particular city. Likewise, and in illustration of his point that successful strategies may be reinforced by positive feedback, note how the arrival of successive waves of migrants from the same place might well have reinforced the decision of the original wave to stay there.
- iii) The large processes thus generated may be responsible for change in big structures: did the development of distinctive Japanese approaches in production organization, like just-in-time and related quality control change the nature of capitalism as a structure?

In order to illustrate these assertions and their implications he then goes on to discuss what he calls 'path dependent development': development which could have gone in different directions but which once set on a particular path (a particular location, technology, for example) foreclosed alternative paths of development. Note the possible link here to Curry's idea of the geographies that might have been since, at one point in time, they were equally probable outcomes.

In order to develop the idea of path dependent development Storper makes use of the idea of increasing returns to scale: input costs per unit decline with increases in the volume of output. These scale economies, note, could take the form of external economies as indeed they do in Allen Scott's version of the path dependent development of new industrial spaces. This is an important assumption since it means that there can be no equilibrium between different

technologies, locations as there might be if increasing returns were not the case. Thus the example he uses of choosing which side of the road to drive on on an island: each side possesses increasing returns to scale since as a higher % of drivers choose one side the very real returns to the choice of that side rapidly rise. The actual outcome is indeterminate and the shift to one side rather than another brought about by quite random circumstances like, he suggests, a car swerving to avoid a dog crossing the road..

In situations of path dependent development, moreover, human agency obviously makes a difference to the creation of large processes. This is because an initial decision can put development on one road rather than another. Under conditions of equilibrating processes, on the other hand, any individual decision tends to be countervailed by another: the decisions of some workers to go and work in a particular city is countervailed by the decisions of others not to as a result of the decrease in wages there caused by the arrival of the initial wave of migrants.