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Geography's place in time

- Recherches
- Le rythme dans les sciences et les arts contemporains
- Géographie
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ABSTRACT : From the moment it began to engage with time in a considered way, human geography has employed a variety of analytical and conceptual approaches to it. Recent work especially has greatly extended the range of these different approaches by stressing the innate variability of time, leading some to talk of 'multiple temporalities' and to pronounce time as 'uneven' even within the same society. Fractured by such differences over how time may be used and interpreted, the possibility of an overarching concept of time in human geography has long gone. However, this does not prevent us from asking whether it is still possible to produce a coherent review of the differences involved. This paper offers such a review, arguing that setting these differences down within a structured framework can provide a clearer sense of how diverse the debate among human geographers has become and the trends of thought that have underpinned this growing diversity. Among the trends identified, it places particular stress on the shift from objectified interpretations to those dealing with relational forms of lived and experiential time and on how the separation of early discussions of space from those on time, their dimensional stand-off from each other, has slowly given way to a view in which space and time are treated as sticky concepts that are difficult to separate from each other.

Key words : time, time-geography, time-space, concepts of time, rationalized time, experiential, tenseness, the present, flow, disjunctures.

Introduction

Whether sustained by human geographers or others, the debate over time has never been a simple affair. As St Augustine said in a much-cited comment from his *Confessions*, he had an understanding of time in his head, but when he tried to explain it to someone else, the clarity disappeared (St Augustine 1961, book 11, ch. 14). If the clarity with which time could be explained was a problem for St Augustine, then how much more is it with the greatly enlarged debate of today ? The various distinctions that may be drawn - such as that between physical and lived time, objectively defined as opposed to subjectively defined time, a time that is given as opposed to one that is socially constructed, or between one that is outside of chronology as opposed to one that is chronologically embedded - are now set down within a far more complex reading. Some would even contend that we live in a world of multiple temporalities, one in which the nature of time and how it is experienced can vary not only between societies but across them, and in which different disciplines or discourses can uphold conflicting concepts of time or emphasize fundamentally different aspects. Some have even talked about how time has become broken or disrupted in the postmodern world to an extent that we can no longer speak of its flow. This plurality of times raises the question of whether it is still possible to construct a coherent reading of the debate. Such is the dissonance present,

with conflicting concepts and interpretations on most aspects of the problem, that we can no longer draw on an overarching concept of time, at least not for the social sciences or humanities. Yet while no single overarching concept of time can now claim validity, we still learn a great deal from trying to understand how the different concepts and approaches map into the wider debate. This paper offers such a review from the standpoint of human geography. Far from slanting what purports to be an overarching review, it will argue that human geography is well placed to produce such a framing owing to the wide range of temporalities employed by it over recent decades. Of course, the subject has not always been so open to time. In its early development as an academic subject, claims for it having any sort of temporal perspective would have seemed perverse owing to the insistence by some of its practitioners on a cross-sectional view of the world designed almost to take time out of the equation altogether. Admittedly, some early twentieth-century geographers, such as Sauer (1967, p. 365) revelled in 'all human time' and pointedly rejected the 'peculiar obsession' which some fellow human geographers had for 'the short-time dimension of the contemporary scene' (Sauer 1967, p. 66), but others proclaimed the geographer's responsibility for freezing the world in maps and representing it as a moment in time, without the temporal noise introduced by process or movement. The intellectual sterility of this type of frozen geography was soon abandoned, but arguably, human geography's initial temporal embrace was still self-conscious about the dimensional boundary being crossed.

Surprisingly, this was the case even with historical geography's engagement with time. European historical geography's early emphasis on the flat reconstruction of past geographies, an emphasis most associated with the Darby approach, demonstrates this point. Because of its heavy reliance on geographically framed datasets based on a single year of record (i.e. Domesday Book, lay subsidies, census returns), such an approach reduced time to a passive framing of successive geographical states. Darby (1962) was aware of this problem. In response, he tried to incorporate time by means of what he called 'comparative statics', but this was still an approach that emphasized the geographical (=the statics) ahead of the temporal (=the dynamics of change). Process was not excluded, but the processes invoked were those that, first and foremost, addressed geographical issues making it a study of what we can label as space-time, time being included but in a subordinate way. In its unequal treatment of space and time, 'comparative statics' had something in common with the early time-series analysis of geographical data. Both dealt with geography *in* time rather than *through* time, their treatment of time being glossed when compared to the spatial. In the case of time-series analysis, the temporal component often had the measured succession of the metronome (t , $t+1$, $t+2$) rather than the situated and variable succession of a definite chronological context. It used an abstract parameter of time, one devoid of all differentiating content or sequence except for the successive spatial differences that lay at the heart of the analysis. The assumed homogeneity of such time contrasted markedly with the way such studies highlighted the changing heterogeneity of space. It could be argued that this over-simplifies the point and, in doing so, misleads. The changing nature of space between each point (t , $t+1$, $t+2$) constitutes, by implication, an heterogeneity of time. Yet the touchstone of difference between phases in some analyses lay in what was defined spatially, not what was defined temporally. For this reason, it is best labelled as a space-time perspective, even though it purportedly offered a time-series analysis.

By the 1970s, a different handling of time had started to emerge, one that set it beside space in a more equal and considered way. Key tap-roots of this more equal and considered use of time may be traced back to Hägerstrand's (1975, 1982) space-time analysis, with its core assumption that people engage in the geography of everyday process within a finite budget of time as well as within a defined framework of space. This was not the idealist time of philosophy or science, but a time rooted in the lived circumstances of individuals, a time that is both experientially and spatially referenced. Adding force to its case was the fact that personal space-time budgets could be reconstructed in different circumstances (e.g. Carlstein 1982 ; Hoppe and Langton 1994 ; Schwanen 2007). Of course, there is a sense in which Hägerstrand's time-geography built on long-established work in human geography that dealt with everyday routines and rhythms, but his approach made the time component more explicit and served to frame space and time together, without prioritizing one over the other. Although referred to as 'time-geography', it was very much a study in space-time. Certainly, others were quick to celebrate it as a union of equals, proclaiming 'space is in its very nature temporal and time spatial' (Parkes and Thrift 1980, p. 12). Yet for all its conceptual and methodological insights, Hägerstrand's coupling of space and time did not invoke a fresh conceptualization of time or, indeed, of space. It made use of a social or experiential approach to time budgets, but the daily, weekly and seasonal

budgets of time that individuals or groups 'spent' were measured in standard clock or calendar time. It shed light on how they used time but it did not tell us too much about how the space and time involved were construed or experienced.

Building on Hägerstrand's work, subsequent discussions took the debate forward in two ways : first, and in step with similar shifts of approach towards space, they brought the interrogation of time's conceptual meaning much more to the fore, treating it as problematic rather than as given as a concept and, second, they have attached greater importance to how we conceptualize its relationship with space. If there has been a discernible direction to this closer interrogation of its meaning and how it links to space, then it lies in the growing stress on time's relative rather than absolute nature, a trend that runs parallel with similar trends in our approach to space. That our concepts of space and time are constructed out of our experience of the world and how we perceive them, rather than presented to us as given or absolute concepts in a Newtonian sense, have long been part of the philosophical debate. Leibnitz's one-liner about space being an order of coexistences and time an order of successions became, in Kant's (1787) reading, an ordering of relations through which we perceive the world. The idea that space and time are not absolute containers or frameworks but bound up with how we see the world, particularly the spatial relationships perceive between objects and the temporal relationships we perceive between events, has been present in geographical debates since the 1960s. Admittedly, in the rapid expansion of academic geography at this point, relational views of space and time were generally suppressed in the search for an objective basis for geography as a spatial science. Those areas of the discipline that drew on relational constructions of space and time, such as early studies of perception and mental maps, stood out as isolated islands of counter-concept within the burgeoning science of geography as spatial analysis, with no attempt to build them into a larger viewpoint about space and time.

When this larger viewpoint eventually developed over the closing decades of the twentieth century as part of a growing interest among human geographers in qualitative approaches, it pulled together a number of different strands of argument. At its core was the growing belief that measured or calibrated forms of space and time had to be seen alongside many other spaces and times. In some geographical readings, time now became 'multiple and heterogeneous' (May and Thrift 2001, pp. 2, 5), varying between individuals, societies and spaces, and as possessing a 'radical unevenness' (May and Thrift 2001, p. 5 ; see also Adam 1990 ; Mills 2000), so that it cannot be understood outside of its spatial context. This 'unevenness' in a world that tries to standardize time has led to the paradox of what Brose (2004, p. 16) calls 'the problem of simultaneity of the non-simultaneous' (also Roberts 1988, p. 545 ; Koselleck 2004, p. 238). This deepening interest in time, an interest that has seen a shift in its treatment from one of exclusion to one of considered inclusion, from being unproblematic to being problematic, from being seen as a dimension that may be objectively defined to being treated as wholly relational, has led a growing number of human geographers to engage with many aspects of the wider philosophical and social debate. As a result, I want to argue that we can best frame a review of the geographical debate by setting it down within the framework of this wider debate.

Altogether, I want to organize what I say under three headings : first, I want to distinguish between the different contexts in which conceptions of time have been constructed ; second - and arising from these different contexts - I want to explore the diverse ways in which the nature of time has been defined or measured, and the implications that this has for the question of whether time flows and, if so, how does it flow ; and third, I want to consider how these different constructions of time affect our reading of space-time.

Contextualizing time

Changing paradigmatic contexts

Any attempt to structure the wider philosophical debate over time, and how the engagement of human geography fits

into it, must begin with the different cultural contexts in which paradigmatic concepts of time have been constructed (Fig. 1.1).

- Figure 1 -

Being paradigmatically rooted, there is a past to how such concepts have developed over the course of human history, one that tracks the shifts in human thought. Possibly the most basic definition, yet one which now has a strangely modern ring to it, is that which supposes that the only time which exists or can be imagined is that of the present, a view that amounts to a strict form of presentism. Such a belief underpins the Australian aboriginal concept of dreamtime during which the present world is continually re-created afresh through ritual. This ritual recreation denies change, preventing the present from becoming history. This sort of foundational belief has led some to argue that human society probably had a concept of space before it had a concept of time. Such an order of development might be explained by the fact that space has 'presentational immediacy' (Whitehead 1927, p. 21), meaning we see it directly as it is, whereas the dimensionality of time has to be mentally constructed through memory, observation and so forth. As Whitrow (1980, p. 2) put it, 'space comes all of a piece' while time 'comes bit by bit'. When societies did come to distinguish between what was of the past, as opposed to what was of the present, it was often a gross past - other times, mythical times - that had no perceived temporal depth to it, a past used as a sort of static counter world. The initial differentiation of what was past from the present produced a selective chronology in which time was phased according to what was perceived as significant in the way of events, reigns and so on. As this relative chronology developed, it inculcated a sense of flow to the past and the compilation of the first narrative histories. In response, tenseness in language became more developed over time (Whitrow 1980), as the growing sense and differentiation of what was past demanded a greater capacity to articulate it. Initially, societies preserved what was vital about their past by using individuals skilled at remembering, so-called remembrancers (Clanchy 1970). With the rise of state societies and the spread of written records that fixed legal and political processes in a temporal setting, still more elaborate chronologies and calendars developed. Time was not only experienced as flowing ; people could call on written proof of the fact. Furthermore, as Elias (1992) argued, with the rise of more complex societies, and the need for more and more people to work or act in temporal step with each other, social concepts of time and their associated disciplines became internalized and more self-regulated at an individual level. Yet so long as religious cosmologies held sway, what constituted time past was still seen as finite, restricted to so-called redemption time, with many societies holding to a dominant view that the world and its times had a definite moment of beginning. Deep time, the distended times of geology and prehistory, did not yet exist.

Paradigmatic contexts and the development of rationalized time

In Europe, the changes in thought ushered in by the Scientific Revolution and Enlightenment Movement combined over the early modern period to transform the way in which time was perceived (Gould 1987 ; Misztal 2003). Societies in the van of this change acquired multiple and competing concepts of rationalized time that were differentiated according to their paradigmatic assumptions and socio-intellectual context (Fig. 1.1). As a phase when society began to reflect more on time and change, it need not be a surprise to discover that some feel that the 'history of time began with modernity' (Bauman 2000, p. 172), and when society's sense of historicity began (Foucault 1970 ; Koselleck 2004). Yet while modernity brought a greater reflection on time, we must not ignore the fact that it also led to a process of ongoing innovation and change that, in itself, intensified society's experience of time (Brose 2004). Arising from the paradigmatic assumptions behind them, we can distinguish a number of overlapping oppositions running through these modern concepts of time : that between substantivist as opposed to relational approaches ; between those that assume time has an existence that is independent of the processes or events which

fill it and those which suppose its meaning to be entirely derived from the relationship between what we perceive as events, or stages of an ongoing process ; between idealist as opposed to realist ideas, that is between those which strive for an objective definition as opposed to those which see it as culturally framed ; and finally, between those that see it as tensed or at least capable of being ordered into earlier than/later than differences and those that suppose time has neither a direction nor a privileged anchor point.

We can arrange these various paradigmatic differences over rationalized time around five broad socio-intellectual contexts : physical, biological, historical, social and experiential. Together, these provide us with a mix of objective and relational approaches to the conceptualization of time. Each stands as a separate category of concept, but we need to allow for the fact that there is a case for grounding the physical, biological, historical and social entirely within an experiential context (Adam 1990).

Time is not a tidy formulation for the modern-day physicist or cosmologist. However tensed they may be in their everyday life, their cosmological time has no sense of tenseness, of there being a significant present with a past and a future, or even of an ordering of events into earlier than/later than. Instead, time amounts to 'an undifferentiated continuum' (Denbigh 1981, p. 4) that has no flow or direction to it. In some formulations, this is captured by the notion of the block universe which supposes all that times exist together, simultaneously, within the same cubic frame of space-time rather than forming part of a flow revealed only through its passage. In such a block universe, the problem becomes one of how events are spatially related rather than how they are temporally related. Such a concept spatializes time, hence the accusation that modern physics plays down the significance of time, constructing a world of *space*-time not just space-time. The notion of a block universe is a deterministic model of time. However, this determinism has now been challenged by a non-equilibrium theory that instates a role for novelty and change, for a directed or historical time, even in the physical sciences (Prigogine and Stengers 1984), a challenge whose significance has not gone unnoticed by geographers (Massey 1999)

Like social time, biological time brings together different forms of time. On the one hand, cyclical or rhythmic time play a significant role in its definition but, on the other, biological time also has a strong directional component. While the ongoing repetition involved in the life cycle imparts a sense of continuous renewal, it is a cycle whose immanent unfolding is uncompromisingly one-way, a progress towards death. On a still larger scale, the conceptualization of biological time is profoundly shaped by the role of evolution, both morphological and genetic, and the irreversibility or directionality of its trends. Like historical time and that of the non-equilibrium theorists, it deals with the experience of the system, or species biography. It is the story of descent with modification, though some biologists would now couch it in terms of 'genetics plus time'. At this level it is not a tensed story, but we can speak of an experience of time on the basis of what is earlier than/later than.

Paradigms of historical and archaeological time are rooted in the greatly expanded chronological constructions of time that have come with modernity, involving the analytical use of all forms of historical data (written records, social memories, field evidence, artefacts, traits, linguistic evidence). Such rationalized historical time is intrinsically stratigraphical and sequential, often concerned either with origins, precursors or antecedents, or with outcomes, consequences or residues. While allowance is made for time moving in different ways, the unifying thread behind all such forms of social time is its irreversible nature. Time's arrow is very much a human experience. What has been termed sequence analysis, an approach to historical change which assumes that the exact chronological order in which events and processes happen - and not just the enumeration of possible inputs and their scaling - matters intrinsically to how they happen and their effects, exploits this irreversibility in a methodological way (Abbott 1995 ; Pierson 2004). Yet while the concern for fixing things, events and processes in their proper place and time provides an objective basis for historical time, its conceptualization has long had a strong relational component to it. As Koselleck (2004, p. 236) put it, since the eighteenth century, history 'no longer occurs in, but through, time'. What he meant was that from this point onward, historians accepted that each age or generation reinterpreted history afresh so that 'history stood revealed in its current truth' (p. 242). But it was not simply about how society now saw itself as continually renegotiating its past. The *neue Zeit* of history was also continually recharged with different expectations

about the future, so that past, present and future were 'being constantly re-ordered with respect to each other' (p. 243), and 'folded into each other in qualitatively different ways' (p. 242). Running through what Koselleck has to say here is the belief that the way in which historical thinking developed from the eighteenth century onward not only changed how society viewed its history and its expectations about the future, making them more explicitly relational in terms of the present, but it also changed how it conceived of time.

Such relational paradigms of time have acquired a more prominent place within human geography over recent years. Genealogically, their emergence in the discipline has two lines of descent. First, we can see them as part of a line of argument that has developed out of time-geography's established interest in the routines and rhythms of everyday life, or lived time, and the growing fusion of this interest with the effort of social philosophers and theorists to theorize the sort of time involved in everyday experience. The social philosophers who have done most to energize this debate are 'not Anglo-American philosophers', who Read (2002, p. 203) sees as 'extremely uninterested' in how 'time is lived', but continental philosophers like Lefebvre (2004), though William James is unquestionably an exception to this generalization (Pred 2005). Second, it has emerged from the work of those who have represented both space and time as concepts that are 'produced' within dominant social systems, or modes of production (e.g. Soja 1989 ; Harvey 1989, 1990). Each social formation, Harvey (1990, p. 418) argued, constructs concepts of space and time that are 'sufficient for its own needs' and as 'vital to its social reproduction' (p. 422). These sociopolitical constructs are arrived at consensually and 'operate with the full force of objective facts' within each formation (p. 419). Our understanding of them cannot be approached via 'an appeal to the world of thoughts and ideas' but only 'from the study of the material processes of production' (p. 422). Harvey acknowledges that subgroups might hold different concepts and sees the potential differences as the basis for 'deep struggles' over the reconceptualization of particular spaces and times and, therefore, as a source of social change. As he also points out, once we argue for the presence of socially produced dominant concepts, then it becomes a small step to seeing the recovery of these concepts in their material, social and political setting as the basis for a new historical geography (p. 432). Comparable ideas have been advanced by Massey (1999, p. 262) in her argument that space and time are wholly relational in character, 'constituted through the social', either as a succession of socially defined relationships and connections or as a positioning of them (Massey 1999, p. 273, 2005 ; Latour 1993).

Contextualizing time : the experiential

An experiential approach to time may be viewed at two levels : either as a category to be set co-equally alongside other rationalized categories (physical, biological, historical and social) or as a category so fundamental to how we conceptualize time that it has the power to subsume all other constructions within it (Fig. 1.2). For this reason it deserves a fuller separate treatment. Two features stand out about it as a conceptualization of time : (1) the fact that it 'arises from [our] relation to things' (Merleau-Ponty 1962, p. 412) so that it can be said that 'consciousness deploys or constitutes time' (p. 414), and (2) the fact that we experience the world directly only through each passing moment or present, or through what Husserl (1983, p. 195) referred to as the ever 'punctual' now. Because what is now, with its 'fleeting narrativities' (May and Thrift 2001, p. 25), is always privileged as our moment of direct temporal experience, it means that 'our intimate consciousness of time' (Michon 2002, pp. 167- 168) is tensed around an ever-moving moment, with what is present, past and future being continually reconstituted through it. Tenseness is solely a function of consciousness, the time of the soul and our human existence, but not time of the world (Ricoeur 1988). Scientists seeking an objective definition of time have no use for its embodied nature and the distinction between what is past, present or future. Yet for the human awareness of time, it is fundamental. In fact, some would argue that experiential time actually grounds all time, whatever the context in which we contextualize it. Seen from this latter position, so-called physical or cosmic time is not arrived at because we somehow step outside of ourselves, but because we arrive at it inter-subjectively, as 'a second order expression' (Merleau-Ponty 1962, p. viii).

What we apprehend as past, present and future represent different perceived forms of time ; yet experientially, they do not have an existence outside of the present. This is why *sensu stricto* we should speak of the past present, the present present (including alternative or virtual presents) and the future present (Adam 1990). In other words, the

present embraces 'the totality of the temporal spectrum within itself' (Osborne 1995, p. 49), or what Husserl (1983, p. 162) called 'its modes of givenness of Now, Before and After, with their modally determined simultaneity and recession'. Interrogated more closely, this idea that all times are accessible to us only through the present reveals significant differences of emphasis. Bergson's view of the present stressed the role of memory in shaping our sense of being and time consciousness, but it is a memory or past in us that 'is always moving on' thanks to the novelty and new information added via each present. In other words, far from being static and unchanging, the past in us is 'swelling increasingly with a present that is absolutely new' (Bergson 1911a, p. 11). This sense of continually becoming, with each new present adding to the past in us, is what he termed duration, or *la durée* (Bergson 1920). Seen in this way, the present becomes transformed from a mere instant or passing moment into an extended present. Phenomenological approaches construe the extended present differently, placing more stress on what is actually perceived or experienced via the present, but we can find significant variation in how such approaches extend the present. Husserl (1983, pp. 194-195), for instance, talks about retention and our awareness of the now becoming 'just now', and its counterpart in terms of protension, but while this defines a unified temporal continuum out of the present and our immediate retentions and pretensions to it, we hardly gain insight into how cultural meaning is sustained through such an extended present. Heidegger's opening up of the present offered more. It is, he argued, that point at 'which future and past affront one another, in which future and past are decisively accomplished and consummated by humans themselves, inasmuch as humans occupy the point of their collision, and are themselves that (Da-sein)' (cited by Elden 2001, p. 48). At the core of Merleau-Ponty's reading was a rejection of the idea that our time consciousness derives a sense of flow from each present. There is but 'one single time' (Merleau-Ponty 1962, p. 421), 'the unbroken chain of the fields of presence' (p. 423). In a compelling phrase, he declared that 'to be now is to be from always and for ever' (p. 422).

Whatever their differences of emphasis, these experiential constructions share a core belief : we access *all* time through the portal of the present or each successive now, including the time of history as well as the deep time of archaeology and geology. It may in one sense be an extended present but it is made up of what Merleau-Ponty called 'a plenitude of time' that has been flattened into the present. In other words, those who envisage a flatpacked world of space-time may actually have a case, but we need to allow for the act of cultural origami by which we temporally unpack the present past, first by classification, then by reconstruction into a reading that has chronological structure and depth (Binford 1983 ; Olivier 2004). While there is a sense in which Franck is right when he claims that the past processes being reconstructed in each present and the process of reconstruction always 'run in different times' (Franck 2000), we must always start with a world in which they belong to the same time, or present, simply because 'there is no meaning to be grasped to the past outside the order to be grasped in the present' (Santos 2001, p. 175). Seen in this way, space-time becomes more like a space-time MANIFOLD, a world made up of different times that are accessible only through the present. In fact, we can find hints of such a world in a range of recent geographical writing (Dodgshon 2008). Analytically, all information that is carried over into the present may be classed as a form of memory : including what is sustained by way of language, values, habits, norms and symbolic codes ; by way of what is written down, recorded or archived in manuscripts, books, prints, photographs, computerized storage systems, census data and so on ; by way of the expert systems, programs, institutional forms and cultures around which modern life has become increasingly organized ; and finally, by way of what is embedded or reified in all aspects of the built form, from its archaeological manifestations to modern industrial and urban systems. We can subdivide what is carried forward as social memory into intuitive or take-it-for-granted information that is primarily carried forward as non-reflective knowledge and what is consciously or reflectively carried forward. Arguably, the great revolution of modern times has been in our ability to carry forward an ever-increasing quantity of information as part of the specialized or expert systems that underpin contemporary life, information which, because of the training required, regulations and so on, is more likely to be reflected knowledge. Others categorize social memory into the subtypes of personal, cognitive and habit (Connerton 1989) or into what is imagined and what is repeated via practice (Bergson 1911b), while others have categorized it according to the means by which memories are sustained, distinguishing between incorporating practices ; that is, postures, rituals and so on and inscribing practices such as writing, recording, photographing (Connerton 1989) or between what is held as semantic, internal memory and what is episodic memory or based on external record (Whitrow 1980). The problem with such classifications is that by using a definition of social memory that relies as much on what is externalized, or reified in records, as on what is internalized as pure memory, they make it difficult to distinguish social memory as a category

of past knowledge from other forms of historical or archaeological knowledge. Geographical treatments of social memory do not escape this dilemma, especially where memory is externally referenced, such as against memorial landscapes. In fact, human memory has long used both the landscape around it (Bradley 2002) and the organization of internal memory around imaginary spaces or rooms (Fentress and Wickham 1992 ; Crang and Travlou 2001, p. 165) as forms of *aide-mémoire*. For this reason there can be no surprise that geographical studies of memory, from the early work of writers like Lowenthal (1975) and Pocock (1982) onwards have explored how places and landscapes are used as forms of episodic or inscribed memory, either to help establish place-based identities or to construct commemorative landscapes (Crang and Travlou 2001 ; Johnson 2003 ; Mitchell 2003). By emphasizing the extent to which society uses place or landscape to reinforce memory, there is a sense in which this recent geographical work comes across as very much focused in its treatment. Yet the emphasis of this geographical work on the role of place or landscape as a grounding for memory links to a vital point, which is that the central role played by groups in forging memories means that the action space occupied by them serves as a 'mental space' within which their 'memories are localised by a kind of mapping' (Connerton 1989, p. 37). In other words, how society anchors its memories in places and landscapes is a core aspect of the wider debate, not a geographical fetish.

What is time ?

Different paradigms inevitably affect how we interpret the nature of time. There are two questions to be posed here. The first is the basic question of what is time ? Does it consist only of what we sense or perceive as filling it ? If so, how do we measure it ? Second, do the changes through which we sense or perceive it amount to a flow and, if so, what can we say about the nature of this flow ?

Taking the first of these questions (Fig. 1.3), the idea that time exists in its own terms, outside of the objects or events that fill it, is one associated with Newton. However, philosophers now warn us against reifying it in this way. Hypothetically, a featureless, homogeneous time may be conceivable, but without change in what occupies it, such a void would have no perceivable meaning, though those who take a substantivist approach still see it as capable of being measured irrespective of whether change is observable or not. For those who see time as meaningful only in terms of change, then, as Massey has argued, all time is relative (Massey 1999 ; see also Elias 1992) and rooted in the context in which we observe or experience it, 'a paradigmatically indexed and context-related expression' (Read 2002, p. 193 ; Rynasiewicz 1996). 'Time in the end', claimed Read (2002, p. 209) in his rejection of a substantivist approach, 'is no more mysterious than other more mundane organizational devices : such as maps or tape measures'.

Such differences clearly have a bearing on how we measure time. For the substantivist, measuring time is about the search for durationless instants, though one criticism of such a view is that this 'time-slice' approach suffers from the weakness of 'spatializing time', emphasizing its horizontal qualities (Read 2003, p. 24 ; cf. Merleau-Ponty 1962 ; Massey 1999). For those who hold to a relational view, we can only make our sense of time through measures of its proxy forms. Hypothetically, the range of such proxy forms is infinite, time being measurable through whatever state change we are interested in. However, eight broad types are distinguished here, each of which has a place in human geography. The most fundamental proxy involves natural calendars, including day/night, the lunar cycle and the seasons. The development of measured or chronometered time did not suppress the role of natural time owing to the intimate connection between them. However, the growing use of chronometered time to order lives and interactions (Thrift 1981) has led to a different, more intense awareness of time partly owing to its increasing representation as cost. Later still, the standardization of chronometered time around GMT released the potential for a more coordinated world, one in which time has become a more exact form of inter-regional and international referencing through common work disciplines, timetables and schedules though, as already noted, this drift towards standardization and coordination has not erased the 'radical unevenness ... of social time' (May and Thrift 2001, p. 5). At root, calendared and chronometered times are still proxy times, measures adapted for purpose. Yet because they both play such a profound role in framing our lives we accept both as somehow given, part of the way time is. In this sense, they can

be distinguished from other more self-evidently proxy measures of time. The powerful sequencing of time flow that we acquire from our memories or from our personal experience of biological ageing might seem a wholly natural measure of its passage, but the way in which it is individualized around ourselves and orientated around the present means it is a form of timing that we accept as intrinsically personal. Biological analogues provide another widely used form of proxy time, one based on evolutionary or developmental metaphors. In the past, human geography has been replete with immanence models shaped around youth, maturity and old age. Another equally widespread proxy has been to conceive its measure in terms of major historical events, trends or shifting identities. Phrases like 'the stone age' or 'as far back as Domesday Book' have a powerful resonance as relative measures of time. By comparison, objective treatments have commonly employed standardized chronologies or abstract forms of time measure, such as that embodied in a sequence of t , $t+1$, $t+2$ and so on, either to frame fixed, evenly spaced intervals of time passage or a sequence of unevenly spaced time intervals.

Does time flow and, if so, how ?

The question of how time flows is a well-worked theme in human geography owing to its early interest in deterministic models and the ongoing interest in cyclical or rhythmic processes. Yet we need to begin with the question of whether there are circumstances in which it does not flow. A starting point here is with the block universe of the physicist in which time does not flow (Fig. 1.4). Different times, past or future, simply occur in different places. In the social sciences, time might be said not to flow when no fundamental change occurs, as with the relative stasis of Braudel's (1980) *longue durée*, his enduring, inertial states, when the changes that normally evoke time are absent. Turning to the different ways in which time appears to flow, the most basic descriptors rest on its direction of flow, forward or backward. The former stems from our most fundamental sense of time, one rooted in how we experience it biologically, experientially and culturally. Biologically it is imprinted on us not just through our sense of ageing, but also through a welter of bodily processes. Culturally, it is a sense of flow that is woven from the constant interplay of the ordinary everyday with major life-course events and rites of passage. We can also see it as a flow derived from our sense of becoming and the continual emergence of novelty with each present (Bergson 1922), especially when combined with Deleuzian (2004) ideas on how the everyday repetition of habit and embodied practice can generate difference and novelty. Turning to the opposite of becoming, the idea of time flowing backward has - at best - a place in human geography only through models based on rise and fall or growth and decay metaphors. Under the heading of time flow as something continuous, we can distinguish between a continuous but regular flow of time as opposed to a continuous but uneven flow : the former being best represented by the fixed, even measure of clock time and work disciplines, while the latter is represented by experiential time and its innate variability of flow (e.g. Lefebvre 2004). Contrasted with the continuous flow of time is the view that its flow can be disrupted by broken, disconnected or disjunctive moments. Of course, the sustained flow of time and these disjunctive moments need not be exclusive but juxtaposed, as with the interplay of Braudel's *longue durée* with his moments of change, or *événementiel* (Braudel 1980).

For some, these disjunctive moments may be epochal. Benjamin saw the rise of technology and its capacity for faithful reproduction as 'shattering' the long-standing monopoly of tradition in determining what was carried over from the past. It had this effect because of the way it reduced the apparent temporal and spatial distance between what was past and the present, a separation on which the role of tradition had depended (Benjamin 1969 ; Caygill 1994). In a more recent incarnation, as the disjunctured moment favoured by postmodernists (Jameson 1991, 2003 ; Dickens and Fontana 2002), time is seen as disjunctured by a break in the flow of meaning from past to present. As in Benjamin's thinking, it draws partly on the way in which the time-space compression brought about by globalization has changed our experience of time-space (Harvey 1989) so that we can 'make an approach to spatiality only through what it does to time' (Jameson 2003, p. 706 ; Thrift 2000, p. 35). Whether through the 'collapse of the far-off into the nearby' (Shields 1992, pp. 181-198) or through the way time-space compression has 'foregrounded simultaneity and instantaneity' (Heise 1997, p. 22), the endless recovery and piecemeal, detached quotation of what is past is seen by writers like Jameson and Latour as overwhelming society with information that is disembedded, or

out of context. They see the sum effect of this overload as a permanent breakdown in the flow of meaning from past to present, a break that would have us living in a perpetually disjunctured, isolated present. Yet while some use the disjunctured moment to proclaim the death of history and what is past, its irrecoverability as meaning, others draw a different conclusion. Thus, Ermath (2001, p. 214) refuses 'to declare it [the past] dead'. With postmodernity, she argues, the 'sequential linkages' have been 'liberated from the fatal forward motion of historical causality' that are built into universal projects and metatheories (p. 209), but this has enabled all the 'past' to become an 'ever-present in the contested patterns of linguistic and discursive recognitions' (p. 214), an ever-present that Roberts (1988, pp. 544-546) has labelled 'the museum without walls'. Although Roberts would qualify the link, there is a parallel here with Benjamin's idea of disparate fragments being drawn from the past and their authentic context and incorporated into a new montage within each present (Roberts 1988, pp. 547-551), an idea drawn on by Pred (1995) in his study of Stockholm. Being a unique assemblage, a disjunctured moment, each montage has no precursor or sequel.

Finally, we can speak of rhythmic time. Rhythms of time-space have long featured in geographical analysis, both in work on the countryside and town. Yet, even in Hägerstrand's time-geography, there was no attempt to conceptualize the sort of time involved in such analyses, only to budget it. Among social theorists and philosophers, Gurvitch (1964), Elias (1992) and Lefebvre (1991, 2004) have all tried to fill this conceptual gap. The thinking of Lefebvre has been especially influential in regard to recent geographical writing. His work on rhythmanalysis distinguished between what he calls rhythmic and linear time, though his supplementary essay with Régulier, rather than his *Elements of Rhythmanalysis*, is actually far clearer on how they should be defined. Both forms involve repetition, but whereas linear time involves 'the monotonous return of the same' (Lefebvre and Régulier 2004, p. 78) rhythmic time is 'a qualified duration', brought about by the repetition of 'differentiated time', such as 'long and short times', 'strong and weak times' and so on. (Lefebvre and Régulier 2004, p. 78), a differentiation that he subdivides into forms like cyclical and alternating (Lefebvre 2004, p. 30). Because rhythmic times were rooted in the calendar of seasonal routines, he considered them as more fundamental, not least because they underpinned the rhythms of social organization. Linear times meanwhile were secondary, being connected with, and spread by, the rise of modernity and industrialism. Lefebvre conceived his reading of rhythmic time in the context of his everyday life project. His intention was to draw out not just how society experienced different forms of temporality in all its activities, including the most ordinary or mundane, but also how people could experience a multilayered temporality, with different forms of rhythmic and linear time interacting together. The 'interaction of diverse, repetitive and different rhythms', he wrote, 'animates ... the street and the neighbourhood' (Lefebvre 2004, p. 30). Crang (2001) has provided the most critical reading of such ideas from a geographical perspective. What he adds to the debate is what he calls a 'temporalisation of space', seeing people not just as 'moving through space-time but making it' (Crang 2001, p. 194). His 'temporalisation of space' discards the notion of each present as a self-contained moment. Instead, he opens it out by bringing 'the virtual', our sense of past and future, into our 'experience of place' (p. 206) ; so that our rhythms of space-time movement acquire 'possibilities of immanent and emergent orders' (p. 206) ; hence his claim that 'the city is a becoming ...' (p. 190).

From timeless space to spacetime

From the moment human geography began developing a considered engagement with time, it did so not just by interrogating the nature of time, but also by asking how it related to space. As noted at the outset, the earliest discussions in human geography tended to suppress the time element. Even historical geographers saw their task as one of recreating maps or landscapes at a moment in time, not through time. In recent years, much has been made of the fact that while some early geographers suffered from a dimensional short-sightedness if not blindness towards time, early social scientists and philosophers as a whole suffered from a mirrored short-sightedness towards space. The point has been made that for much of the twentieth century, many social analyses worked from the presumption that change was about history and therefore about time, whereas space provided only a passive backcloth (e.g. Massey 1992 ; Soja 1996). Soja (1996) and Massey (1999, 2005) have convincingly challenged this blocking out of space from any active role in the debate. Yet even before their challenge to the spaceless nature of many

metatheories of social change, social theorists and postmodernists were also finding a place for space in their theorizing. Initially, this opening up of space to social theory was unbounded, linking space-at-large to time-in-depth, as with the Giddens' (1984) geographically-minded structuration theory. In more recent years, this new championing of space has brought two intertwined ideas into focus : globalization and postmodernism. The integration of large amounts of space via globalization, and the increasing ability with which we can access such space and its differences almost in an instant, combined with the way postmodernist thinking sees the flow of time as disrupted by the information overflow of modern times, has led to the belief that space is now a more meaningful, legible and accessible dimension for understanding society than time. Not only do we find social theorists now arguing that the 'thrust of modern theory has been to privilege the spatial over the temporal mode of analysis' (Featherstone and Lash 1995, p. 1 ; Heise 1997, p. 1), but we also find postmodernists of all shades arguing for the primacy of the spatial. If the modernists were obsessed with the role of time, Jameson (2003, p. 695) wrote, then some postmodernists have become obsessed 'with that of space', with statistics of books on space being 'as alarming as the birth rate of your hereditary enemy'. What this means is that while some geographers have been calling for the opening up of time to space, some theorists have been talking past them by closing down time and arguing that perhaps space is all we need. We can soften these differences a little by arguing that there have long been some outside of geography calling for a greater role for the spatial in studies of social change (e.g. Febvre 1924 ; Braudel 1972). It is not so faddishly new. Likewise, while some social theorists and postmodernists have downplayed the role of time in favour of space, others in social science, as in human geography, have actually called for the rediscovery of time (e.g. Hassard 1990, p. 1 ; Mills 2000, p. 93 ; Bash 2000, p. 199). Pierson (2004, p. 4) has gone so far as to see the 'historic turn in the social sciences' as something new. The role of human geographers in this recent debate has been to eschew such one-sidedness and to argue about how they come together. Indeed, the trend of recent discussions in the subject, a trend led by writers like Thrift (2000 ; May and Thrift 2001) and Massey (1999, 2005), has been to see them more and more as sticky concepts that are difficult to disentangle, hence the growing discussion of space-time and even spacetime, not space and time.

From this debate we can distinguish four ways in which space and time have been handled (Fig. 1.5). Two are represented by those that distinguish between space and time only to emphasize one at the expense of the other, as with, first, timeless space or *space-time* , and, second, its mirror opposite, spaceless time or *space-time*. Respectively, these might be illustrated by studies that suppress time, notably those that use maps to limit rather than release analysis, and historical studies that suppress space, notably those in which narrative process has no explicit spatial framework.

Third, there are those approaches that regard space and time as being interdependent, analytically so, but still maintain their distinction, as with Massey's space-time (1999, 2005 ; see also Crang 2001, p. 195). We can differentiate this approach into a number of subtypes. Space-time substitution sees them as being capable of being traded off one against the other, such as one finds with the timing and spacing of periodic markets (e.g. Ullman 1974). This particular sub-debate can itself be divided into those who use space-time substitution to spatialize time and those who use it to temporalize space, making each accessible through the other. To spatialize time is to classify spatial differences in temporal terms, as when societies and economies in different areas are represented as societies and economies at different stages of development, an approach reviewed critically by Fabian (1983) and Agnew (1998). To temporalize space would be to try and see the same suite of geographical differences historically, from the vantage point of a single place and its history, though we can also see it in the terms used by Crang (2001), as the ongoing awareness of past and future with which individuals or groups inform each moment in their rhythms of movement. Another subtype, space-time compression or convergence, captures the process whereby human movement and interaction has become quicker and easier over time. Yet though a widely employed concept, it contains fundamental contradictions. We can actually make a convincing case for seeing globalization and changes in communication as bringing about space-time expansion, with more space being integrated into global systems and more being squeezed out of each unit of time. Likewise, the term 'space-time convergence' might seem inappropriate if one notes how these same changes have produced a world in which more space is being embraced but in less time (Graham 1998, pp. 165-185). Such a world is better described by the term space-time divergence (Bauman 2000). Finally, there are those approaches to space-time that see both as necessary to any dynamic social analysis

but play on the fact that each contributes something qualitatively different. To cite a provocative example provided by Jameson (2003, p. 697), time governs the realm of interiority and space that of exteriority.

Fourth, there are those approaches that erase the differences between space and time to the point at which they cannot be analytically separated out from each other. The hyphen that Bergson is famously seen as inserting between time and space is removed by such approaches, to produce spacetime or timespace (Wallerstein 1998 ; May and Thrift 2001). Like Massey (2005), they deal in a socially embedded space and time that emphasizes their interdependency, such that space is inextricably bound up with society's experience of time and time consciousness (May and Thrift 2001, p. 3) and time with society's experience of space and spatial consciousness (May and Thrift 2001, pp. 2-3 ; cf. Parkes and Thrift 1980). However, whereas Massey maintains their dimensional distinction, writers like May and Thrift range their argument against any sort of dualism. Drawing on Latour and his emphasis on circulation rather than entities or essences, they note that any event 'equals a shift in space, a shift in time and a shift in action' (May and Thrift 2001, p. 28). It is to emphasize their interdependency that May and Thrift dehyphenate space-time, or time-space as they prefer to call it, into timespace, so that they now become so closely coupled as to be inseparable, turning it into an illusion of dimensions comparable to one of Escher's illusions of perspective. They do not push their definition of timespace to the point of declaring it to be unidimensional, as Wallerstein (1998) has done, but they clearly lead us in that direction, the chorographic effectively fading away before the choreographic.

Conclusion

I have tried to draw out the gradual shifts in how human geography has engaged with time. From an exclusive concern with objective consensual definitions, it has broadened its time consciousness so as to embrace relative forms of temporality. These relative forms may be broken down into those that see the prime challenge for the subject as deconstructing the dominant forms of temporality that have developed within particular social, economic and political settings and those which stress the importance of experiential forms of temporality with their emphasis on the primacy of the extended present as the portal through which we experience all time, past, present and future, and the co-existence of multiple, overlapping forms of temporality. This broadening coverage has inevitably spawned a new agenda in our dealings with time, an agenda that ranges from Harvey's proposed historical geography of how society has constructed time (and space), through the reconstruction of everyday rhythms in the style of Lefebvre as well as Hägerstrand, to a growing engagement with experiential time. However, running through this new agenda are two generic problems whose resolution will determine how much the subject gains from its dealings with time : the first concerns whether space-time remains hyphenated or, alternatively, is hybridized into a unidimensional form, while the second concerns the extent to which we can clarify how our experience of all time as flat-time, or as something accessed only through the space-time MANIFOLD of the 'extended present' affects our analytical use of time. Significantly, some of the most challenging issues developed over the past decade bring these generic problems together. The question of whether time-space compression has changed our experience of time and space is an obvious illustration of this, globalization being seen not only as changing our sense of how time and space might be mutualized, but also as intensifying our experience of each extended present.

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