

# WILLIAM BUNGE AND GEOGRAPHY'S GREAT DIVIDE

by

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For the longest time geography has been a radically divided field between the two sides of which there has been little in the way of conversation: these are human and physical geography. In *Theoretical Geography* Bunge thought that space would be the uniting element; that his version of theoretical geography applied regardless of substance, and even while his book had a clear bias towards the interests and language of human geographers. It was not to be. The paper explores the reasons why Bunge had such little impact on physical geography; and how that helps us understand the nature of the relation across 'the great divide.' The explanatory emphasis is on respective concepts of space that still remain apart and on why they remain apart.

## BILL BUNGE AND THE QUESTION OF INDIVISIBILITY

Bill Bunge's *Theoretical Geography* only makes sense as part of a broader intellectual movement for which he, in effect, provided a more abstract understanding and indeed legitimation. This was the spatial-quantitative revolution which was influential, primarily in human geography, from the late 'fifties through to the early 'seventies. Just why it emerged when it did has been discussed and contested (Cox 2014: 26-30; 236-239) and need not detain us. The crucial point about it was that it was an attempt to make human geography into a generalizing science based on a particular view of space as relative; in other words, to put behind it the dominance of notions of space as absolute as expressed in the particularizing regional geography which the new generation

wanted to displace. A new human geography would rise based on the measurement of the geometric aspects of locations – and the idea of location was central to the new dispensation – including their distances from others, their connections to others, their orientation in terms of flows to others, relations of point-locations to areas or lines, the effect of boundaries on movement, and so on. But from the start it was recognized that if progress was to be made in this direction, the new generalizing science could not be merely inductive. There had to be some theory to structure the research process and make sense of the accumulating research results. There were theories already to hand in what would come to be known as location theory, above all the contributions of Christaller, Lösch, Von Thünen and Alfred Weber – a curiously Germanic bunch, in other words. There were also some patterned relations, notably those yielded by the gravity model, which while hard to theorize, nevertheless added support to the idea that location relations could be generalized; that once one examined relative locations and their correlates, like flows, then indeed human geographies seemed predictable.

Bill Bunge would be the one to impart a more abstract sense to all this in his book *Theoretical Geography*. Taking a firm stance against what he regarded as the particularizing tendencies of human geography hitherto – “Locations are not unique. The nearer the geographer to Chicago the more Chicago-like his location” (p.100) – he argued for a science of geography based on what he called spatial relations. These comprised spatial pattern or structure on the one hand and movements which generated those patterns on the other: so location as both something to be explained and as also, in its alternative verb form, the explanation. Pattern and movement would come together in the form of what he called the nearness problem: finding that spatial arrangement of interacting objects that places them as near to each other as possible: “If interacting objects are placed as optimally near to each other as possible, then typically a pattern is formed ... Thus, instead of movement and pattern being contradictory concepts, they are dual expressions ... (and) can be designated *spatial process*, meaning movement over the earth's surface, and *spatial structure*,

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meaning the resulting arrangement of phenomena on the earth's surface – the distributions” (p.211.)

His book is notable for the way it abstracts from any notions of substantive process. Movements could be anything: migration, advancing ice sheets, the diffusion of ideas, the circulation of the atmosphere. The same applied to patterns: the pattern formed by rivers in a drainage basin, the distribution of cities, of climatic zones, or whatever. He believed that his theoretical geography applied regardless; it could therefore embrace both human and physical geography and so resolve the division in the field. The nearness problem was manifest in both, air masses move from high pressure to the nearest low pressure, albeit structured in their directionality by the Coriolis force subsequent to the rotation of the earth; in economic geography there is a net migration from lower wage areas to higher wage areas, but so as to minimize movement (p.211.) Likewise in contemplating a uniform distribution of points along a line:

“One method of obtaining a grasp of the power of the pattern is to stare at the unlabeled pattern and ask yourself ‘Of what is this a map?’ Some possible answers include filling stations along a highway, major volcanic peaks along the Cascades and the distribution of ice cream vendors along a beach. Note that these suggested applications to the earth's surface are more than shallow spatial coincidences. For instance the total travel cost along a beach for the consumer of ice cream is minimized by such a pattern. The volcanic pattern minimizes the movement of magma in the fissure, or put in another way, the uniform distribution marks points of the greatest internal pressure” (p.254.)

In other words: Highly imaginative and stimulating. Even so, the insistence on location suggested a human geography bias in his understanding and, as it turned out, his assumptions about the world and those of spatial-quantitative geography had limited effect on physical geography.

There were some notable exceptions. The British geomorphologist Richard Chorley was to the forefront and he and Peter Haggett co-wrote a book on network models in human geography (1969) intended to bridge the divide. Peter Haggett (1967) wrote a highly imaginative piece which tried to transfer Horton's notions of regularity in the geometry of drainage basins to transportation networks. Trend surface analysis was drawn on in both physical and human geography. There was also some interest at the University of Iowa: a major center of spatial-quantitative work at that time – topics like the geomorphic significance of the clustering of sink holes in karst topography. Climatic geomorphology looked at the relations between climate on the one hand and particular landforms on the other. But the impact on physical geography overall, and aside from some methodological contributions like John Rayner, the climatologist, on the applicability of spectral analysis to both human and physical geography, was unremarkable.

One of the problems was that, seemingly quite independent of these developments in human geography, relative concepts of space had been for a long time a necessary aspect of physical geography. The way in which certain features of the physical landscape went together in ensembles of related features – scarp and dip topography, the basin and range of the Western US, the knock and lochan<sup>2</sup> features of the Canadian and Scandinavian shields. Later this interest in pattern would be given precision in geomorphology in Horton's morphometric laws, work relating them to (e.g.) climate and vegetation and Leopold and Maddock's hydraulic geometry of streams. There had also long been awareness of spatial pattern in climate as summarized in Köppen's hypothetical continent, of specific features like rain shadows, and an orderliness in the patterns defined by ocean currents.

But, and quite crucially, relative concepts of space were a subordinate aspect in a more developed

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<sup>2</sup> According to the Blackwell Dictionary of Physical Geography, “A landscape of ice-molded rock knobs with intervening lochans (small lakes – KRC) which had been eroded along lines of structural weakness” (1985: 257.)

conceptual framing of process and form: subordinate because of a dedication to a relational concept of space in which the individual forms studied by physical geographers – depressions, heat islands, monsoon climates, alluvial fans, glacial deposits, were *in effect* seen as what Harvey has called ‘permanences’ to be understood as internalizing influences, conditions from elsewhere.<sup>3</sup> They were to be understood in terms of broader transfers and transformations of materials and energy going from (e.g.) weathering and erosion, through transport to deposition as in some of the diagrams that W M Davis drew to illustrate his ideas of a cycle of erosion. Storms were understood in terms of the circulation of the atmosphere, both in its horizontal and vertical dimensions, including the movement of air masses and the effect on their stability or otherwise of the surfaces over which they moved. As the attention of geomorphologists moved beyond the establishment of morphometric regularity so they would come to emphasize the explanatory significance of the hydrological cycle.

In short, and notwithstanding the arguments of *Theoretical Geography*, the great divide endures. Human geographers have discovered the virtues of relational space but by and large, for reasons to be discussed, that doesn’t seem to have made much difference to unifying the two fields of physical and human geography. What, therefore, is to be done? How might we understand the great divide and soften it? Doreen Massey tried to get a conversation going on this and in the second part of this paper I want to review briefly review her contribution and before making some arguments on how we can go beyond it.

#### BRIDGING THE GREAT DIVIDE

For Massey, what human and physical geography share, and despite the differences between human beings and other elements of the natural world, is that they are both what she has called ‘complex, historical sciences:’ something denied both by the spatial-quantitative work in human geography and the emergence in the 1960s of the dynamic

geomorphology school of Strahler and his pupils.<sup>4</sup> Rather the systems of relations that they deal with should be recognized as open rather than closed which means, in turn that space cannot be the container that it was for the spatial-quantitative geographers or for the students of fluvial systems, who focused on the drainage basin as a natural object of study. Rather it has to be conceived in relational terms as both condition for, and construct of, processes that are in their turn of a structuring nature. Given the way in which space is differentiated and changes over time, this means a break with a focus on equilibrium solutions and an embrace of the geohistorical character of landscapes, both physical and human.

Complexity, both for Massey and others, had other, complementary aspects. These included a recognition of the role of non-linear processes: positive feedback effects which move systems away from equilibrium positions. Likewise the fact of emergence had to be recognized: how particular time-space configurations of elements resulted in qualitatively new objects with distinct capacities for change in the world, as in the phenomenon of thresholds. This did not mean the entire rejection of equilibrium solutions. Over the short term and in small geographic areas they are possible, but over the longer term they are increasingly likely to be disturbed in enduring fashion. Likewise the non-linear can co-exist with the linear, just as emergence does not mean that reductive solutions may not apply in some instances. And the configurational only makes sense in terms of more general sorts of laws: Mediterranean climates around the world differ as a result of particular configurations of land and sea, but the fundamental controls in terms of atmospheric pressure patterns remain the same.<sup>5</sup>

This, of course, is light years away from Bill Bunge’s attempt to bridge the great divide. It is in part a result of the supercession of the concept of relative space at the heart of his imaginary by a relational one; but also a recognition of the

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<sup>3</sup> This framework is clear in both Terjung (1976) and Strahler (1980.)

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<sup>4</sup> Massey’s physical geography emphasis is confined to geomorphology. On Strahler’s pupils and their significance, see Kennedy 2006: 109.)

<sup>5</sup> Various understood as the contrast between the configurational and the immanent (Simpson 1963) or context and composition (Hägerstrand 1984.)

importance of substance which would then entail, for some human geographers at least, a relational turn. Even so, physical geography in its practice has always assumed relationality in a way which has proven more elusive for human geography. Space is assumed to be an essential aspect of physical processes whereas in human geography there is a long history of separation between space and the social. *The Blackwell Dictionary of Physical Geography* when compared with its Human Geography counterpart testifies to this. Its pages are peppered with maps and three-dimensional diagrams, the latter exemplary of the pictoriality which has always been one of its important pedagogic features and in my view, a reflection of its unselfconscious embrace of relationality. *The Blackwell Dictionary of Human Geography*, on the other hand, is entirely different: a striking contrast. So the question is: Why?

Physical geography certainly accepts and incorporates ideas of relative space into its practice. How else might one understand rain shadows, the Asian monsoon or the variable geometry of fluvial systems? There again, it is useful in the sort of preparatory sense envisaged by Strahler and Terjung: the clues that fluvial patterns give to processes of river capture; or that the mapping of tornadoes gives to *their* formation. This practice, though, is subordinated to a relational view of space. Monsoons are to be interpreted in terms of the way in which differential heating and cooling properties of land and sea interact with the global circulation of the atmosphere, and the distribution of land masses simply intensifies the effect: so particularly strong in South and East Asia. Rain shadows are to be understood in terms of the circulation of the atmosphere, notably prevailing winds and the moisture content of different air masses: the rain shadow over England is born in the Gulf of Mexico!

In human geography since Bunge there has been change in the way in which space and process have been conceived but the sort of relationality characteristic of physical geography has proven elusive. Concepts of relative space have continued to dominate. There has obviously been some shift away from the pretensions of spatial theory and the sort of absolute concepts of space that Sack

(1972) criticized in his attack on what he called 'spatial separatism': space as empty.<sup>6</sup> Sayer formalized the arguments about relative space and the significance of matter and its arrangement but they had already been implicit in the work of the spatial-quantitative geographers. As early as 1967 Brian Berry had pointed out the significance of population density for central place geometry, just as five years later Curry demonstrated the significance of the spatial arrangement of cities for the distance exponent in the gravity model.

Recent arguments from a post- direction have allowed some shift from relative to relational concepts of space but the advance has been partial. This is because of the 'post' focus on binaries and their deconstruction, but binaries that are conceived separately from one another, and without reference to the wider social dynamics that structure them and to which they are therefore related in an internal manner. Doreen Massey's later work was seemingly more successful. She tried to demonstrate the irreducible uniqueness of places because of the way that they were formed at the intersection of diverse and highly particular influences in time-space. But she stopped short of showing how these influences and conditions might cohere in certain ways rather than others; why some influences got incorporated and others didn't. In human geography the embrace of relational space is therefore something yet to be completely realized. Furthermore, the celebration of fragmentation that is a distinguishing aspect of the posts does not give confidence that this will yield easily to claims of a more organic sort of coherence.

Harvey (1989) gives us a clue as to how to move beyond this by arguing that the fragmentation at the heart of the posts is simply the way in which the capitalist form of social organization is experienced; how it presents itself. Both nature and society are externalized as a result of the separations subsequent to capital's emergence<sup>7</sup> but

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<sup>6</sup> The particular version of absolute space implicit in the most austere conceptualizations of the spatial-quantitative work.

<sup>7</sup> Hence: "The more deeply we go back into history, the more does the individual, and hence also the producing individual, appear as dependent, as

in studies of society there is a further separation into seemingly autonomous parts. This sort of pluralizing imaginary is reflected in the way in which the social sciences are divided and the way in which they try to justify their separation: the state / economy / culture / space as autonomous, as in how geography is a 'factor' in the economy. Society is sliced up into bits that interact one with another in a purely contingent fashion.

For Harvey, this fragmentation is illusory. On the one hand, it is analytically useful to think of society in terms of a set of what he calls 'activity spheres' but these are internally related to one another, even while that internality has to be continually re-established. To give some concrete form to these 'activity spheres' and while recognizing that there is nothing fixed about them he has distinguished, *inter alia*, between the division of labor, the relation to nature, technology, institutions, power relations, discourse. Any social object or practice necessarily expresses all of these as, for example the automobile. Curiously what Harvey does not mention in his various discussions of the 'activity spheres' making up the social process is the

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belonging to a greater whole: in a still quite natural way in the family and in the family expanded into the clan; then later in the various forms of communal society arising out of the antitheses and fusions of the clan. Only in the eighteenth century, in 'civil society', do the various forms of social connectedness confront the individual as a mere means towards his private purposes, as external necessity" (*Grundrisse*, p.84.) Likewise his remarks on the relation to nature, which is, incidentally a very different way of handling the binary than typical of critical human geography: "The individual relates simply to the objective conditions of labor as being his: [relates] to them as the inorganic nature of his subjectivity, in which the latter realizes itself ..." (p.485); and: "It is not the *unity* of living and active humanity with the natural, inorganic conditions of their metabolic exchange with nature, and hence their appropriation of nature, which requires explanation or is the result of a historic process, but rather the *separation* between these inorganic conditions of human existence and this active existence, a separation which is completely posited only in the relation of wage labor and capital." (*Grundrisse*, p.489.)

relation to spatial arrangement. Yet to take up the case of the automobile again, it is obviously internally related to this just as much as it reflects and conditions divisions of labor and relations to nature or, as Marx would have it, 'discloses' or 'reveals' (Harvey 2008) something significant about them.

Each 'activity sphere' has its own tendency to independent development. There is, therefore, a contingency to development but one which, as Harvey and Scott emphasized, can be internalized within the social process as a whole: "We need to show ... how particular contingencies that on first sight *appear* as external and arbitrary phenomena are *transformed* into structured internal elements of the encompassing social logic of capitalism" (1989: 19) (my emphasis). Novelty in an activity sphere emerges, generating contradictions, and possibly contestation before either emerging victorious and being internalized or left to wither on the vine. In other words, the reference here is to the social process as a unity in contradiction, and spatial arrangement is a necessary aspect of that process.

Particular innovations in spatial organization, like the regional shopping center, may have a contingent origin but to the extent that they work, to the extent that necessary preconditions like the automobile and property capital are satisfied, then they can be internalized as a necessary aspect of capital's spatial arrangements. But, like other features of social change under capitalism, this is experienced as external, as a contingent matter, rather than internalizing tendencies already present in society. This is because of its necessarily contradictory appearance, setting off in this case struggles with the smaller, local retailers who internalize a set of social relations now under pressure. What had seemed under control is now seen as out of control: a sphere of location change that is external.

What imposes unity on the social process under capital are flows of value; and before it circulates through its various forms of appearance it has to be produced. It is around the question of production, therefore, that the unity of the social process is not only disturbed and then re-established, but also contested: in short, unity for

whom? But given the dynamism of capitalism as a mode of production, the forms through which value circulates are subject to chronic transformation, which then sets the stage for struggles around their internalization. This applies to spatial forms, as well as the institutions, power relations, divisions of labor and the like that they must internalize in order to make their appearance. This then disturbs the totality of existing social relations, setting off a process at the end of which they either become internalized as the answer to some ongoing contradiction; or fall by the wayside as a failed experiment. Meanwhile, the sense is one of shifting ground beyond human control.

In physical geography likewise, it is flows that are central to unities, in this case natural ones, and which reproduce and transform landforms, climates, vegetation complexes and the like: flows of water through the hydrological cycle, the geotectonic movements of the earth's crust, and the movement of material over the earth's surface, whether transported by water, wind, or ice. In physical geography this internality is recognized as such: spatial arrangement is essential to processes of erosion, deposition, and the formation of depressions. Water *has* to either infiltrate or flow downhill; streams *have* to deposit when they encounter a decline in gradient and their energy diminishes; the velocity of a stream *has* to increase with its volume as a result of decreasing friction with bed and banks; air that is warmer than surrounding air *has* to rise; air *has* to move from areas of high to ones of low pressure. And so on. Likewise, the objects of analysis in physical geography are conceived spatially from the start – depressions are thought of in terms of their spatial structure as are the Asian monsoon, fluvial systems, lakes<sup>8</sup> or mountain ranges.

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Bill Bunge was clearly wrong when he argued, in the full blush of pioneering enthusiasm, that his theoretical geography could apply equally to human and to physical geography. To the extent that physical geographers paid any attention to

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<sup>8</sup> An essay topic that apparently Barbara Kennedy gave to her undergraduate advisees at Oxford: "Lakes are either long or round." Discuss. (<http://www.geog.ox.ac.uk/news/articles/140520-kennedy.html>.)

him, they must have been mystified. They took space for granted as an essential aspect of the processes that they studied. Human geographers were more easily persuaded, even while his claim that relative space could be the basis of a spatially predictive science would be quickly rejected. Moving beyond that point to a human geography that bases itself on a relational concept of space, subordinating ones of absolute and relative space to its logics has proven far more elusive. On the other hand, it would be hard to imagine where human geography would be today without the spatial-quantitative revolution for which Bill Bunge was a sort of high priest. It made theory and method a priority, and not least, and perhaps unintentionally, the very concept of space itself and how it is imbricated with matters of substance.

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