

Discontinuity

In a very wide acceptance, discontinuity is what separates two different, neighbouring spatial ensembles. It is possible to distinguish elementary discontinuity, constructed on the basis of a single indicator, which is a useful but vulnerable indicator; and structural discontinuity, which is the superimposition of numerous elementary, convergent discontinuities that are measured from a coherent set of indicators. This latter type can be defined as the spatial form of the transition between two neighbouring systems.

Discontinuity can be referred to as «border» discontinuity when there is an appropriation of space and "legal" recognition of the boundary. Barrier is the term used when the discontinuity is accompanied by a marked disturbance in flows; a barrier can possess an observable, physical feature (a wall, a ditch, etc) but this is not always the case.

Discontinuities can be described according to their elementary forms. On a given scale of observation it is usual to distinguish linear discontinuity, where the boundary is reduced to a single threshold, and area discontinuity, which is a transition zone between two thresholds (for instance an appearance threshold and a disappearance threshold). It is important to observe the spatial organisation of discontinuities: on a map the type of organisation «linear, in rings, chaotic, etc» will not have the same implications in terms of outcome for spatial systems. Spatially organised discontinuities generally resist better over time. Other interactions are observed between discontinuities and the outcome of the system. For instance, in the absence of a barrier, «neighbourhood» differences will tend to self-regulate: beyond a certain level of difference, it becomes more advantageous to overstep the discontinuity. Conversely, the presence of barriers can lead to divergent evolutions in space, or even to the formation of new autonomous systems (allopatric speciation).

Certain authors consider discontinuity as the application to space of the notion of crisis. Geographical discontinuity does indeed present in space the same properties as crisis in time. If we adopt the viewpoint of an observer moving through space, discontinuity is a "catastrophe" that occurs at a point of weakness, under the effect of a catalyst. Its occurrence is very often more the result of processes that are internal to the system (endogenous discontinuities) than of outside disturbances (exogenous discontinuities). It is often the latter type that draws attention, and if discontinuity is viewed at the most local scale of observation there is the risk of missing the main feature: this occurs classically in the case of the forest/savannah discontinuity, which is determined locally by the composition of the soil, but which, fundamentally, owes its existence to rainfall. Thus it can be seen that there is a need to focus on the heart of spatial systems. It is not however possible to oppose the analysis of the system to the analysis of discontinuities, even if fringes are disregarded, if only because the sudden appearance of internal discontinuities, or in other words of new forms of organisation of local heterogeneity within a spatial system, can contribute to destabilising it and to breaking it down to form several autonomous systems. Thus it can be seen that the analysis of discontinuities is fundamental in geography, if only in order to identify (and circumscribe) «spatial systems».

Bibliographie