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## EUROPEAN BOUNDARIES IN SPATIAL RESEARCH

**Abstract:** An extensive overview of concepts of boundaries is made in the paper. Concepts of 'natural' versus 'artificial' boundaries are discussed. The analysis of the relation between the notions of boundary, limit and border is provided and the concept of sovereignty analysed. The investigation of the functions of boundaries are pointed to. A link is made between the concepts of the boundary and spatial barriers. The 'erosion' of European boundaries is analysed. The processes of the liquidation of frontiers, as well as the transformation of borders and boundaries are discussed. Main factors of change in the functions of European boundaries are identified. The development of different types of European trans-border regions is pointed to.

**Key words:** political geography, boundaries, European space.

### 1. THE PROBLEM

The question of boundaries is of special interest in contemporary Europe. It is mostly because of the different paths of the development of boundaries in the loosely defined European East and West. While West European international boundaries are being permanently eroded by the process of European integration that tends to change them in purely formal lines, the ex-intra-national boundaries in the former Soviet Union and, especially, Yugoslavia, which had hardly any practical meaning before, are growing as new lines of international divides. Paradoxically for the external observer, and tragically for the people and peoples involved, the latter divides follow lines which were functionally designed as meaningless delineations of but the ranges of bureaucratic competences.

In this context, it must be stressed that the concept of 'boundary' has always been interesting for spatial research. This concept has been traditionally, even though informally, related to that of 'spatial barrier'. The informality of the

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relation results from the fact that the concept of boundary has been traditionally used in regional and political geography while it was merely in the context of spatial innovation diffusion that attempts were made of the systematic analysis of the notion of spatial barrier (ŁOBODA, 1983), even though this very notion was used in geography much earlier (HUNDINGTON, 1916; HARTSHORNE, 1932; REES, 1945).

## 2. 'NATURAL' VERSUS 'ARTIFICIAL' BOUNDARIES: THEORETICAL FORMULATIONS

The discrimination between 'natural' and 'artificial' boundaries is firmly grounded in regional geography, even though it has been criticised for a long time. Any conventional linear boundary not created by nature has been categorised as artificial. The concept of natural boundaries, in contrast, stems from the ideas of the Enlightenment, which referred, especially if it was convenient, to nature and its laws (POUNDS, 1954).

The notion of natural boundaries originates in the works of MONTESQUIEU (1957). ROUSSEAU (1948) included mountains, seas and rivers in that category. ARNDT (1813) argued, on the contrary, that it is lingual boundaries which are the only *de facto* natural boundaries. This statement gave rise to a Franco-German polemic concerning the nature of natural boundaries. Four basic concepts of natural boundaries can be identified in this debate (POUNDS, 1954):

- a) the concept of 'historical boundaries', as based on arguments of tradition;
- b) that of 'natural boundaries' in a strict sense, based on the 'laws of nature';
- c) the German concept of 'national' boundaries, as based on language and 'race'; and
- d) the French concept of 'national' boundaries, as based on 'culture' (de COULANGE, 1893).

Generally, it was pointed out that the concept of natural boundaries was an ideological superstructure for the territorial expansion of states and as such it was inseparably related to the concept of *Lebensraum* (POUNDS, 1951). Other authors, similarly, included 'natural boundaries' and 'historical boundaries' among basic 'pathological complexes' of our times (PERROUX, 1950).

It was indicated (HARTSHORNE, 1933; BROEK, 1941) that the notion of natural boundaries had rarely been defined while much more frequently it meant something different for each author. For this reason, the term was argued to be non-scientific (SÖLCH, 1924).

HARTSHORNE (1933) suggests that the term 'natural boundaries' had been applied to cover five different types of boundaries, viz.:



- a) natural defence boundaries;
- b) naturally marked boundaries (*naturgemarkten Grenzen*, according to SÖLCH, 1924); ‘boundaries borrowed from nature’, according to WHITTLESEY, 1944 (*naturentlehenen Grenzen*, according to SIEGER, 1917); or boundaries marked in nature (*Natur-marken Grenzen*, according to SÖLCH, 1924);
- c) chorographic boundaries (*choren Grenzen*, according to SÖLCH, 1924); natural area boundaries (*Naturgebietsgrenzen*, according to SIEGER, 1917); or structural boundaries, (*Strukturgrenzen*, according to MAULL, 1928), i. e. the limit of areas similar with regard to landscape characteristics;
- d) organic or harmonic boundaries (GEISLER, 1932), i. e. those of areas interrelated economically;
- e) cultural landscape boundaries.

Being types rather than classes, the above mentioned are neither non-overlapping nor exhaustive.

In the Roman Empire, the notion of natural boundaries was related to their defence; rivers, mountains and watersheds were, therefore, regarded as natural boundaries (JONES, 1959). In this sense, large rivers were natural boundaries as, with the level of technological development of those times, they were the best boundaries from the military point of view (ADAMI, 1927). However, this did not weaken the argument that they were communication paths along the boundary at the same time (GOTTMANN, 1952). On the other hand, the Latin term for ‘boundary’, *limes*, applied merely to ‘artificial’ boundaries (JONES, 1959).

The case of the Roman Empire, mentioned above, is interesting because it indicates that the conflict between the political and the communication role of rivers as boundaries is not unavoidable. The application of the notion of natural boundaries implied, however, such a conflict. This resulted in a long-lasting debate between protagonists and antagonists of the ‘naturalness’ of rivers as boundaries.

It is interesting to find that the boundaries dividing Charlemagne (to which the French concept of natural boundaries has been, at least implicitly, related) were zones rather than lines which did not follow exactly the main rivers: Schelde, Meuse, Rhine, Saône and Rhône (POUNDS, 1951). In the Middle Ages, the function, and, therefore, also the location of the boundary resulted from a basic divergence between the notion of lordship, i. e. the legal feudal supremacy, and that of sovereignty. Within one tributary area, boundaries divided territories with common administration but different supremacy. Possessions of some towns in the Low Countries were, for instance, located on both sides of the Franco-German boundary. This did not produce conflicts since local matters were quite different from those of the states (POUNDS, 1951).

It was also suggested that the concept of rivers as ‘natural boundaries’ might result from the cartographic determinism (POUNDS, 1951). It was indicated

that this concept originated from the popularity of the sixteenth-century maps in which rivers were given importance which they had neither for the landscape nor for people. It is from those maps that, for instance, the role of Rhine as a natural barrier for the translocation of armies might result.

Generally, it was argued that watersheds are more logical and more natural boundaries than rivers. The special role of watersheds was related to agricultural areas, especially to irrigated ones, in which the unity of the river basin was highly desirable (JONES, 1959). Other authors indicated, however, the invalidity of this simplified hydrographic determinism by providing arguments that it ignores pastoral areas. An example of Tibetans was provided for whom the verge of the grassland, the fringe of the pine forest and the 50-inch (1270 mm) rainfall contour, beyond which there is no salt, forms the boundary. The latter limit, which cannot be observed in the landscape, is much more important for Tibetans than the main range of the Himalayas (WARD, 1932).

HARTSHORNE (1933), analysing the location of the boundary between Silesia, on the one hand, and Lesser and Greater Poland, on the other, found that this boundary had roughly divided the Odra basin from that of Vistula, however the *de facto* location of the boundary had never followed the watershed which is hardly visible in the lowland. It was only minor streams of upper Prosna, Brynica, Przemsza and Biała which formed the 'natural' hydrographic boundaries. As political boundaries, they were more proper than large rivers just because the boundary was more unequivocal. The accuracy of this finding is confirmed by the fact that the boundaries following those streams existed for ages.

This was because there was no conflict, in the case of the minor streams, between their political and communication function.

The adequacy of mountains as 'natural' boundaries has also been questioned. It was pointed out that even high mountains need not form barriers for settlement and transport. In tropical forests and deserts, mountains used to be the centres of settlement and nodes of transport (JONES, 1943). Mountains cannot be taken as a base for unequivocal linear delimitation because the watershed rarely follows the main range. Therefore, the watershed need not be a barrier in the mountains, the more so that the location of the watershed on the earth surface does not, as a rule, follow that of the underground watershed (JONES, 1943).

It was also indicated that natural barriers should not be misidentified with natural boundaries since extensive forest complexes, deserts and swamps do not, similarly to mountains, determine the unequivocal location of the boundary (JONES, 1943). 'Natural' boundaries, i. e. the political boundaries based on natural phenomena, are therefore bands rather than lines (RATZEL, 1897; SÖLCH, 1924).



### 3. 'NATURAL' VERSUS 'ARTIFICIAL' BOUNDARIES: A CRITIQUE

Generally, with the theoretical development of geography, successive categories of 'natural' boundaries were questioned, i. e. rivers, seas, watersheds and mountains (LENCEWICZ, 1958). Some authors proposed to discriminate 'objective' and 'subjective' rather than 'natural' and 'artificial' boundaries (de LAPRADELLE, 1928). If the borderland is unpopulated, physical phenomena prevail and the watershed is an ideal boundary. In the areas with the prevalence of anthropogenetic phenomena, on the contrary, the plebiscite is argued to be the only objective criterion of the delimitation. The concepts of 'objective' and 'subjective' boundaries were, however, also criticised (KRISTOF, 1959).

It is interesting to note that it is political boundaries which have always been considered, at least implicitly, within the 'natural' boundaries context. This implies that the 'naturalness' of boundaries is a relative rather than absolute term and, therefore, boundaries can be more accurately categorised as either less or more natural. The relativity of the naturalness was suggested by HARTSHORNE (1933) who contrasted 'natural barriers to trade' (*Naturschranken*, according to SÖLCH, 1924) to 'natural communication divides' of certain degree of effectiveness. In practice the differences between the virtues of 'natural' and 'artificial' boundaries are slight since any boundary is man-made (ADAMI, 1927; JONES 1943). Therefore, 'physiographic' boundary sounds more reasonable than 'natural' boundary (BROEK, 1941).

The concept of rivers as 'natural' boundaries was criticised, in turn, by indicating that rivers as communication paths are regional bonds rather than boundaries (ROMER, 1901; LENCEWICZ, 1958; JANISZEWSKI, 1959; PISKOZUB, 1968). This is especially true in the case of forest and desert areas (JONES, 1943). Others, however, argued that since rivers are potential regional bonds, they should be good boundaries (LYDE, 1915).

SANGUIN (1983) contrasted two basic images of the boundary, viz. :

- a) a dividing boundary, i. e. a barrier (*la frontière de l'image-barrière*) and
- b) a uniting boundary (*la frontière de l'image-liaison*).

The concept of the uniting boundary is related to that of the zonal boundary (*frontière zonale*). The concept of the uniting boundary (*frontière-lien*) is related to the 'defunctionisation' of the boundary as a result of the integration processes (VALLUSI, 1976). In that case, the boundary becomes more a location than a divide whereas both the dividing and functions of the boundary should be analysed empirically (*Les régions. . .*, 1975).

Since all boundaries are man-made, even those which have no physical background are becoming entrenched in the cultural landscape of the region and transformed into 'natural' boundaries simply by their stability (FISHER, 1949). The mechanism for the 'becoming entrenched' of boundaries in the cultural landscape, apart from their origin, was provided by HARTSHORNE (1936) who

indicated the relation between the notion of (political) boundary and that of inertia. This relation can be seen in the fact that the boundary produces durable marks in the landscape, and the longer a given boundary exists, the harder are those marks to liquidate (SANGUIN, 1983). The marks can be both visible and invisible. To the former, the agricultural and industrial landscape may be included (HARTSHORNE, 1933; VERHASSELT, 1964) while the system of values and of property belongs to the latter (VERHASSELT, 1964; SANGUIN, 1983).

Generally, therefore, arguments on absolute naturalness or artificiality of boundaries are purely scholastic. This is because the obvious fact of the contiguity of the earth surface implies conventionality of any linear boundaries.

KRISTOF (1959), assuming that any international boundary is based on law, argues that at least some misunderstandings which grew in the discussion on 'natural' and 'artificial' boundaries result from different interpretation of the term 'law'. Three meanings of the term can be distinguished. First, in the discussion on boundaries, a natural law, i. e. a scientific law, may be meant. Laws of this kind are based on empirical facts and they have no creative power to nature while they must be in concord with the objective reality. Secondly, a natural law in the sense of the Enlightenment may be meant, i. e. a moral law. Laws of this kind are based on moral accounts, i. e. the postulative reality. Thirdly, judicial law (*lex*) may be meant, i. e. a formalisation and specification of the moral norms of the given socio-political system. This law applies to behaviour of society members and because it can be broken, it disposes repressive means.

The concept of boundary is related to the judicial concept of law (KRISTOF, 1959). In these categories, political boundaries are spatial manifestation of the extent of jurisdiction (SANGUIN, 1983). State boundaries are always a legal concept, apart from the fact whether or not they follow such 'natural' limits as rivers or mountains (KELSEN, 1952). Opposite to 'boundaries' between physical geographic phenomena, political boundaries do not exist in nature itself but they are always man-made. To fix boundaries is, therefore, political rather than geographical problem (SCHÖLLER, 1957). Rivers or mountain are boundaries as far as a certain concept of boundaries is accepted. In nature only those boundaries exist which one wishes to find. In different places and different times the same natural phenomena may be or may be not boundaries (BRUNHES and VALLAUX, 1921).

#### 4. BOUNDARY, LIMIT, BORDER

Let us consider now the relation between the notion of 'boundary', 'limit' and 'border'. The basic difference between the former two lies in the degree of formalisation of the phenomena defined by those notions. The notion of boundary applies to political divisions of different kind based on judicial law



(ADAMI, 1927; JONES, 1943; KELSEN, 1952; KRISTOF, 1959) while that of limit refers to physiographic divides of the contiguous earth surface (KELSEN, 1952). Neither of those two notions is synonymous to that of barrier. The latter need not be related to a linear form and it is related more certainly to the notion of permeability than to that of formalisation.

The basic difference between boundary and border is one between a linear and area form (KRISTOF, 1959). It was argued that boundary is inner-oriented and modelled by centripetal forces while border is outer-oriented and modelled by centrifugal forces (KRISTOF, 1959).

In ancient times, the concept of border was related to the frontier of the inhabited world and implied the tendency of the *ecumene* to expand. The ancient Roman 'artificial boundary', *limes*, was in fact the border of the *ecumene* of the Western civilisation. In the Middle Ages, the times of the, at least declared, world empire, the border was the forehead rather than the background of the state. The concept of boundary is related to that of fixed and established linear limits. This concept is, therefore, appropriate for the modern concept of the state – one of many. The concept of boundary is related to that of sovereignty, which has territorial connotations (KRISTOF, 1959).

In the context of the arguments provided above, the notion of 'natural boundaries' seems non-coherent. This was pointed out by SEMPLE (1911, p. 204) who argued, even if in rather naive terms of her epoch, that "nature hates fixed boundary lines".

As a summary of the discussion on 'natural' and 'artificial' boundaries, HARTSHORNE'S (1938) arguments can be accepted that:

- a) there are no differences between 'natural' and 'artificial' boundaries because all of them are man-made;
- b) all boundaries may be questioned at certain time so the problem is relative;
- c) the boundary problems are human;
- d) the boundary questions are generally of minor importance for the countries involved while they are substantial for the people personally affected.

The last point was empirically evidenced (HOUSE, 1959).

SANGUIN (1983) stressed that concepts of boundaries have long been considered in fallacious and liturgical terms of natural boundaries. The prevailing experience weakens, however, the dichotomic division in artificial and natural boundaries and indicates sterility and invalidity of that division. What turns out fruitful are functional analyses of boundaries.

## 5. BOUNDARIES VERSUS SPATIAL BARRIERS

While most considerations concerning spatial barriers apply to their 'form' (LOBODA, 1983), those concerning boundaries have traditionally been related

to their origin. In more recent approaches the interest has, however, been moved to functions of boundaries (MINGHI, 1963). The latest approach seems to provide a useful framework for an analysis of the relations between the concept of boundary and that of spatial barrier.

HARTSHORNE (1937), in his analysis of the Polish-German boundary dispute in the 1930s, indicated there was no solution of this conflict in terms of territorial changes, the only solution being a change in the function of the boundary, i. e. the reduction of its formalisation. Others, however, argued that the function of the boundary reflects the socio-political differences and similarities between respective societies (MINGHI, 1963; SANGUIN, 1983).

Boundaries were considered as spatial barriers for a long time (HOLDICH, 1916; BOGGS, 1940; REYNOLDS and MC NUTTY, 1968), mostly, however, in terms of 'natural boundaries'. From the perspective of their functions, it was proposed to divide boundaries and spatial barriers into internal and external for the analysed interaction, both natural and political barriers being included in the latter category (YUILL, 1965).

As based on the degree of the formalisation of spatial barriers, it was indicated they can be classified either smoothly or discretely. If the former, they can be classified according to the degree of their formalisation. If the latter, they can be divided into informal and formal, and the latter additionally in soft and hard (RYKIEL, 1986). Political boundaries, both intra- and international, can be classified as formal barriers, hard formal barriers being accompanied by boundary control. Physiographic and cultural boundaries are classified as informal barriers, even though they can limit social and economic relationships.

The degree of the permeability of spatial barriers (BOGGS, 1940) is a separate theoretical category from the degree of their formalisation. The two categories are not correlated negatively as for informal and soft formal barriers low permeability can be characteristic in the case of a given interaction (relationship). Any political boundary is nowadays a spatial barrier (ŁOBODA, 1974), however only for territorially fixed relations. From this point of view, a question whether the boundary is a spatial barrier is an obvious tautology. The same boundary need not, however, be a spatial barrier for territorially free relations. In this context, therefore, a question whether the boundary is a spatial barrier is not a tautology.

The simple formal/informal dichotomy of spatial barriers, as well as the hard/soft dichotomy of formal barriers, is valid only on the conceptual level, i. e. in a static approach. In the real-life dynamic world, formal and informal barriers are dialectically interrelated within socio-economic territorial systems. This results from the fact that boundaries are not static but changeable in time (BOGGS, 1932).

HARTSHORNE (1933) proposed to classify boundaries on the base of their origin as 'antecedent' and 'subsequent'. Even though formally this is a



'genetical' classification of 'boundaries', in fact it applies to the 'functions' of 'spatial barriers'. While antecedent barriers are previous to the forms of spatial organisation, subsequent barriers are later than the local forms of spatial organisation. Whatever is its origin, during time the boundary 'becomes entrenched' in the cultural landscape of the region (HARTSHORNE, 1936).

Because the Hartshorne terms refer to the geomorphological terminology, antecedent barriers are said to be 'eroded' during the regional integration. The development of subsequent barriers (boundaries) results, on the contrary, in the decomposition of the existing pattern of interrelationships. Some authors (SCHÖLLER, 1957) analysed the decomposition in terms of detriments made by such boundaries (*Grenzerreissungsschäden*). In this context, those boundaries might be categorised as 'artificial' as they divide homogeneous territorial socio-economic systems with a long tradition of existence, considerable degree of internal integration and intensive, in some cases, spatial organisation, therefore they decompose established ('natural') patterns of interrelationships. An empirical evidence was provided of the technical difficulties to fix an antecedent boundary in a highly industrialised region under mining operations (HARTSHORNE, 1933).

Empirical evidence was provided of the dialectic of the antecedent and the subsequent. The boundary between Egypt and Palestine, fixed in 1906, was recognised as 'natural', even though straight-line, and antecedent because it cut an unsettled desert. After its re-establishment in 1982, however, the boundary cut an urban area (BRAWER, 1983) so it must be categorised as both subsequent and 'artificial'.

Generally, the notions of spatial barrier and boundary cannot be regarded separately from those of the degradation ('erosion') and accumulation of its role (DZIEWOŃSKI, 1957). The development of both antecedent and subsequent spatial barriers can be interpreted in terms of the re-orientation of the spatial pattern of relationships.

The concept of 'spatial barrier' was formulated within the spatial innovation diffusion context. Within regional geography the concept of 'boundary' has traditionally been used, although it was in this context that interactions across boundaries were analysed. This analysis implied that boundaries were considered in terms of spatial barriers, even though the latter term was not used (HARTSHORNE, 1933; MACKAY, 1958). In this context, the notion of 'boundary effect' was provided (MACKAY, 1958), as well as a somewhat more vague notion of 'the interruptive role of the boundary' (ULLMAN, 1939; MOODIE, 1950; MINGHI, 1963). The former of the two strictly corresponds to the notion of 'barrier effect' in the context of spatial innovation diffusion (YUILL, 1965; MALM and WÄRNERYD, 1967).

To conclude, it is worth to stress that the notion of 'boundary' only partly covers the wider meaning of 'spatial barrier'. Roughly, the boundary can be

identified with hard formal barrier. While, however, the concept of boundary refers to formalisation, that of spatial barrier is related to permeability. Hence 'barrier' is related to the concept of areality while 'boundary' implies linearity, whereas the latter is a special case of areality. Not very proper, even though widely spread, is the identification of the boundary with either the spatial barrier or the border.

Antecedent boundaries are more 'natural' than subsequent boundaries because they are sanctified by the longer tradition of existence. The degradation of those boundaries is, however, also more 'natural' than the accumulation of subsequent boundaries because the former process is related to integration.

## 6. CONTEMPORARY EUROPEAN CONTEXT

The 'erosion' of boundaries seems characteristic of the developed world, including Western and East-Central Europe. Three main trends operate in this context.

The first trend is one to liquidate frontiers by their transformation into borders. This development results from the fact that the *ecumene* has yet expanded so that hardly any no man's land can be found between national territories in the developed world. On the other hand, the former no man's land within national territories transformed in classical peripheries.

The second trend is one to transform the original borders into boundaries. This development is also related to the intensification of the spatial organisation of individual nations. While ten-metres-wide belts of ploughed soil can still be found in agricultural areas of Eastern Europe, this does not happen in tourist areas in the East-Central European mountains.

The third trend is one to transform the original boundaries into limits. This development is related to the deformalisation of international boundaries within the process of European integration. The general rule of non-questioning of the existing international boundaries is being accepted and this fact underlies the changes in functions of the boundaries, a development unsuccessfully postulated by HARTSHORNE (1937) six decades ago.

Eleven main factors of change in the functions of European boundaries can be identified after SANGUIN (1984). These are:

- a) human mobility;
- b) trans-boundary commuting to work, caused by differences in salaries and exchange rates;
- c) trans-boundary industrial investment;
- d) joined development of the transport infrastructure (airports, motorways, canals, submarine and submountainous tunnels, etc.);
- e) the development of boundary-crossing shopping centres;



- f) cultural exchange, i. e. trans-boundary commuting to cultural facilities (theatres, festival, concerts, etc.);
- g) the growing role of the media in the cultural uniformisation;
- h) trans-boundary marketing, including advertising;
- i) the twinning of communes, i. e. agreements of trans-boundary inter-communal co-operation;
- j) trans-boundary joint ventures in sports;
- k) trans-boundary joint management of tourist and leisure facilities.

The changes in the functions of European boundaries are certainly important for the nations involved, they are, however, essential for the communities directly affected, as HARTSHORNE (1938) suggested. This especially applies to the local communities in the areas located next to the deformed boundaries between East and West, e. g. in western Slovenia and Poland.

Trans-border regions are being developed which are being subsequently formalised as Euroregions. Three categories of the latter can be identified. These are:

- a) Western Euroregions, i. e. those within the European Union and the EFTA countries;
- b) Western-Eastern Euroregions, i. e. those embracing parts of both Western (Germany, Italy) and East-Central European countries (Poland, Slovenia, the Czech Republic);
- c) Eastern Euroregions, i. e. those within East-Central and Eastern European countries, mostly Poland and her neighbours.

What seems to be the future of boundaries in Europe is, therefore, their de-formalisation. While deformed, European boundaries seem to have limited chances to grow as spatial barriers dividing civilisations, technologies, economies, people and, all proportions regarded, cultures.

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