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FUNCTIONAL LOGIC AND TERRITORIAL LOGIC AND HOW THEY INTER-RELATE IN THE REGION

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Introduction

This contribution aims to examine what writings in the field call functional logic and territorial logic. Functional logic roughly corresponds to the post-war mode of production. Much has been written about this mode, which is generally called 'Fordism' (Aglietta, 1987; Lipietz, 1977). However, since the late 1960s, the theoretical models used in regional economics have displayed certain limits with regard to explaining changes in the economic map of Europe and the United States. Territorial logic endeavours precisely to take into consideration the spatial turnabout (Aydalot, 1986b) which has been developing since then. Territorial logic will mainly be studied in connection with the idea of the milieu. In this context, we shall present a first attempt to systematize the problematic of the field.

Functional Logic

As the aim of this chapter is not to present functional logic, we shall merely describe briefly the mechanisms thereof.

Functional logic is based on a set of components made up of large markets and a foreseeable development of technology. The coherence of this set is maintained through very strong organization within companies and the establishment of relatively rigid ties between the company and the outside. Associated with this set is a specific way of managing and using the capital and wage ratio. Along with major companies and trade unions, the managers are major players; thanks to their position as intermediaries between capitalholders and salaried workers, they hold the power, and they impose their plan, which may be summed up as the growth of the company.

In general, the emphasis in functional logic is on taking advantage of economies of scale in production, stepping up the capital stock per worker and incorporating technological progress into the production process. To master this expansion, production structures must be set up internally whose various actors have well-defined roles to play that may be called functions and which are only coherent

in the light of the functioning of the set as a whole.

The conditions which make it possible to use these procedures are basically as follows:

- there must be a certain amount of production standardization, which allows for market expansion;

- technology must either be stable or its development foreseeable if investments are to be recovered over a known period of time;

- in the production sphere, it is necessary to reconcile increased production, the adaptation of production techniques and return on capital and the wage ratio by strictly defining jobs (including the division between design-related jobs and execution-related jobs), required skills and procedures;

- lastly, the company must have sufficient financial strength to allow it to grow; this strength is both the means and the condition of the functioning of the system.

Effects of functional logic

i) Polarization effect

Owing to the factors on which it is based (particularly growth and innovation in large companies) and the resultant means, functional logic leads to several different types of concentration which have spatial ramifications:

- technical concentration: the size of the company is increased so as to simplify production processes and benefit from economies of scale and in order to integrate several stages of the production process at the same place;

- concentration of power: the process of functional integration always implies that structures are set up and rules defined with a view to ensuring the coherence of the organization as a whole. This goal always leads to a loss of autonomy by the various sub-sets to the benefit of a central body;

- economic concentration: the economic clout (in terms of revenue paid out, consumption of intermediate goods, etc.) of the largest companies is tending to increase;

- market concentration: this schema implies that there is a gradual shift from a market of free competition to an oligopolistic market.

ii) Specialization effect and spatial division of labour

Functional logic operates by making increasingly fine role distinctions with regard to both companies and employees. Separating design-related work from execution-related work and hierarchizing roles leads to corporate behaviour which seeks to take advantage of its environment by paying the lowest possible price for the various types of work it needs (for example, by hiring or purchasing goods manufactured in lower-cost areas) (Aydalot, 1976).

The paradigm of the spatial division of labour

Functional logic therefore leads to a type of spatial configuration called the spatial division of labour. The spatial economy and the way in which it finds expression in terms of economic policy, namely, the regional economy, have led to a discourse on space and practices. Practices give rise to a justificatory discourse which itself affects practices. This dual dialectic has formed an ideology of economic space which functions like a paradigm, i.e. as a unique means of representation accepted by all. Debates on economic space obtain information in the context of the paradigm, which is itself never called into question. By denying the specific nature of territories, the paradigm reflects a growth model which favours expansive accumulation (integration of agents and constant expansion of the space subjected to one's rules) (Pecquent, 1987a).

In all cases, this paradigm supposes that the centre is the driving force into which everything else must fit; it is the centre which creates the technologies and lifestyles and the only way the periphery can develop is by tapping and assimilating as rapidly as possible the elements from the centre (Aydalot, 1986b).

The Crisis of the Spatial Division of Labour and the Appearance of the Concept of the Network

The paradigm of the spatial division of labour has proved incapable of explaining the new spatial dynamics which have been noted since the early 1970s; new concepts have therefore been developed to take such factors into account.

We shall examine here the concept of the network, because much material has been published on this subject (Pecqueur, 1987; Planque and Py, 1986) and because it marks a moment of transition in reflection with regard to regional economies. In an initial phase, the concept of the network made it possible to reformulate to a certain degree the former paradigm of polarization and the functional division of labour; it has developed since then and is now at the heart of what we now call territorial

logic.

As this transition has been taking place, the overall economic context has been undergoing far-reaching changes. The appearance of new competitors with lower production costs is pushing firms to find new products or procedures which enable them to opt out of the productivity race.

At the same time, as a result of the development of new technologies, particularly in the fields of electronics, EDP, microtechnology and new materials, it is now possible to make considerable improvements to a great many of the products we know and the procedures we use (Perrin, 1986). Thus, there exists an **innovative potential**. Furthermore, this innovative potential is very loosely defined: owing to the flexible nature of these technologies, many different uses can be envisaged for extremely diversified applications, and the production process in a great many old and new sectors may be restructured.

Owing to the above, technological innovation has become paramount. Moreover, it can no longer develop within the operating framework of a well-structured body. To take the case of the automotive sector: technological progress moves in a well-defined direction; the aim is to manufacture automobiles which are more and more comfortable and economical, pollute less, go faster, cost less, etc. However, in the capital goods industry, clothing, EDP, etc., there is little or no sense of direction and the dynamics depend on mechanisms whereby the size of the company or its organizational structure may become real hindrances.

Consequently, the specific strategies of the various individual or joint actors once again become key factors as far as innovation is concerned. An individual who acts dynamically and completes a project is viewed as being situated in a **network** of persons or bodies with whom he interacts; this network enables him to put together the various pieces which are needed for innovation (Perrin, 1986; Soulage, 1987; Pecqueur, 1987).

The individual manipulates his network. The logical consequence is that all one has to do to create additional innovative potential is to enrich the network. These are all policies of technopoles which aim to set up at the same site companies, a research centre and even commercial or administrative departments. It was thought that it was enough to bring all these elements together for each network to enrich itself from the capabilities of the others. Yet this vision is functional insofar as the various companies or bodies under consideration are seen as pieces of a puzzle which merely have to be brought together in one place for the puzzle to form. However, this vision, like policies aimed at attracting high-tech companies, overlooks the fact that the links underlying a network are cultural, not structural. **Most of the net-**

works studied in regions which have become dynamic already existed before these regions experienced strong growth: links between entrepreneurs or technicians in former industrial regions, links between former students in high-tech regions, and family, trade union or professional links in Italy. Thus, with territorial logic, innovation is the product of the emphasis placed on historically constituted know-how and technological culture thanks to internal dynamics. It does not spring from a planned upstream-downstream ordering of companies and bodies.

Territorial Logic and the Milieu

We now examine the components and functioning of territorial logic.

Although there is a wealth of material on this subject, it is quite clear that even if all the authors situate themselves at the same level of reality, many different terminologies and concepts are used. In this chapter, we shall attempt to make an initial summary of the material among these contributions which we feel refers exclusively to territorial logic. Among the notions used are the local industrial fabric (Thomas, 1987), the localized ecosystem (Planque, 1983; Pecqueur 1987), the industrial district (Garofoli, 1986), the local industrial system (Raveyre and Saglio, 1984) and the milieu (Aydalot, 1986a and b; Maillat, 1988).

In the light of recent developments concerning the problematic, it seems appropriate to list these notions, particularly that of the milieu, which this paper develops (for more developments and details, see Maillat and Perrin, 1989).

The milieu - a 'black box'

Judging from the wealth of new terms, it would appear that there is a level of analysis which remains ill-defined and where interesting economic phenomena may be observed. This level hardly fits traditional delimitations: it is trans-sectoral, does not cover a well-defined category of agents and does not have specific geographical limits. Notwithstanding this, vocabulary provides some indications. The word milieu suggests a framework of analysis with both an inside and an outside. Up until now, efforts to understand the milieu have focused on its effects (innovations, production of technology, etc.) rather than its composition and internal functioning. Yet it would appear that the time has come to define this framework better and to pinpoint its contents.

The milieu as a constituted whole

The aim is thus to describe the components of the milieu. To simplify matters,

these components may be divided into three groups: the territorial production system, the actors and the cognitive dimension of the milieu.

i) The territorial production system

The territorial production system is structured round three fields between which flows circulate (Maillat and Vasserot, 1988):

(a) The territorial production apparatus which is made up of companies; in this connection, it is appropriate to identify the characteristics which are relevant to the problematic studied. For example, a key factor from the standpoint of innovation is knowing whether the functions of corporate R & D are localized in the region in question. In this connection, another fundamental element is company structure (groups, independent establishments, secondary firms, etc.) and capital ownership (from inside or outside the region). A milieu must not be subjected to the logic of filtering so that companies may be in a favourable position as far as innovation is concerned. In this respect, in view of the fact that their roots are generally stronger in the region, small and medium-sized companies have an important role to play.

In many regions, companies maintain ties with each other. A certain amount of inter-company coherence therefore emerges which may take the form of sub-contracting relations of dependency, sub-contracting of specialty, complementarity, competition, interdependence, partnership, etc. This may lead to certain corporate configurations, such as a network, a subsidiary with a major company - either upstream or downstream -, a host of very small firms, etc. Another element which is important today is the presence of company services. It would appear that industrial activities can no longer develop without incorporating new service functions at all stages (research, management, marketing).

(b) The labour market, whose structuring effect on the milieu is worthy of note. If one considers that individuals are mobile and that employment is the main factor governing their insertion in the milieu, it may be said that only attractive jobs are likely to attract and hold the labour force. Moreover, the important thing from an individual's point of view is not access to a good job, but rather to a set of jobs which are likely to allow him to fulfil his professional aspirations. With regard to unskilled labour, it appears that the key factor is not so much the number of jobs, but rather the possibility of achieving stability.

Thus, if the jobs which companies offer do not have certain attractive characteristics, they will not manage to keep employees, and hence not train them, either in training institutions or in-house.

(c) The scientific apparatus, which covers all of the milieu's structures and institutions of training and research. This set is important to the reproduction of skills and know-how and above all to their updating based on technological development and market needs. Today, the focus is on technological policies. A milieu does not need high technology to be dynamic: it is much more important for it to know how to use technology by adapting it to suit its own needs. Thus, the scientific apparatus has become a key component of the milieu insofar as it is capable of providing the milieu with appropriate technology.

ii) The actors

The various actors of the milieu are companies, socio-professional groups, public authorities and individuals. It is important to list these actors to underscore that many interests come into play here and that many strategies come into confrontation in a milieu (see below). One might think that the joint aim is regional development; this results in reality from a host of economic and political projects, which are aggregated according to a complex process. Thus, the milieu comprises an original combination of planned and quasi-planned elements (Brun, 1985a).

iii) The cognitive dimension

All of the above elements are, a priori, very heterogeneous and show no signs of coherence. Coherence is obtained through the cognitive dimension of this body: the various actors do not act as robots within the various elements described. If one attempts to analyse the process, one might say that these actors start by perceiving the various elements of the milieu. This perception is more than mere eye contact, and inevitably requires understanding. Consequently, a company is not a building which contains machinery and people with a view to manufacturing a given product. It is rather an entity which has specific characteristics and a past and which plays a role viewed as such in the productive system, in the balance of power, and in the technological, economic and social context of the milieu, whether it be as a company or through the people who work there or run it. This points to an entire set of relations. Yet this perceived set of relations must be systematized so as to avoid logical contradiction and to become understandable. Let us suppose, for example, that a given company which the milieu perceives as very competent, technologically speaking, endeavours to introduce a new technology and that this attempt is a total failure. Given this company's representation in the milieu, the milieu will attribute this failure a priori to the new technology. It may be noted that, if no other factor comes into play, this assessment will become final without the technology in question having been examined as such.

It is clear that the various elements of the milieu are reordered or restructured

within an entire network of coherent mental relations which endow them with meaning. This is how a **coherent system of representations is formed.** Thus, when the environment changes, new technologies emerge, or cultural changes occur, the actors who belong to a given milieu make a more or less selective reading of these trends which is designed to make it possible to re-position changes within systems of representation.

These systems of representation have a collective dimension owing to the fact that they are constructed in a context of permanent interaction between the individuals of a community and their environment (Farr, 1984; Bassand and Hainard 1985). Once the elements of the milieu have been perceived, then understood thanks to their integration in the system of representations, the next step in the process is the elaboration of strategies. This stage, like the previous ones, is reached by each actor, according to his position and his own interests. As a result, the various strategies are inevitably in a more or less harmonious relationship with each other. However, even when conflicts do occur, the coherence of the milieu as a whole is not affected, as this coherence is not defined in relation to the interests present but rather in relation to a space of reference and a procedure of rationalization which is common to all actors. If we take the example of an employee in a workshop who makes a production improvement, the distribution of the benefits of this innovation creates a conflict of interest between employee and company. Nevertheless, this innovation occurs in a common place, in a clearly defined and shared technological context, and it is only possible to understand the importance of this innovation through a shared knowledge of the concrete situation in question.

Finally, the last stage is putting these various strategies into action. At this level, the process may or may not lead to the reorganization of the constituent elements of the milieu.

An example: know-how

Among these representations, the different types of know-how are worthy of note. These different types, as they appear in the milieu, are rarely totally objective entities. Thus, the different types of know-how are representations, products of the perception of the various elements of the milieu, technology and markets in general. For example, know-how, and more specifically its technological aspect, is constituted by all the capabilities which allow the application of skills or reinforce their applicability; it is therefore not limited to the possession of skills, but includes their arrangement based on the concrete conditions of their application as well as the elaboration and implementation of strategies. It may be noted that the conditions of application follow the same process of arrangement. We thus see that

know-how can, inter alia, be characterized by objects which enter the field of perception. For example, the productive act gives rise to the elaboration of know-how which is directly related to the means, work objects and skills of an individual; individual know-how tends towards the knack which one has. The types of know-how which are developed through contact with training or research institutions have a less physical dimension and are closer to a reformulation or a reappropriation of knowledge with a view to adapting it to production. Lastly, know-how transmitted in professional circles comes from contacts with one's peers, through observation, communication and emulation. In general, know-how is the body generated by these different sources and it is the characteristic of being a body which brings out the primary feature of know-how, namely, its **integrative ability:** the ability to integrate science, the market, equipment and raw materials with a view to adapting them to production, all this based on the opportunities and constraints dictated by the specific characteristics of the production apparatus, the labour market and the technological culture of the milieu.

It should be noted in this connection that systems of representation tend to be stable. In general, individuals seek to preserve their system of representation. Of course, representations are also transformed by the pressure of events, but this transformation is not simultaneous and always interacts with existing representations. In this way, reformulating the old representations makes possible the process of breaking off/filiation (Aydalot, 1986a and b) and ensures that there is continuity between old and new situations.

As Planque (1983) points out, actors' behavioural changes are subjected to changes in their system of representation. By modifying the systems of representation which these actors create from their milieu and environment, cultural and/or technological development modifies the behaviour of these actors and their actions and, by extension, the organization and dynamic of the milieu.

A first definition of the milieu

When conceived in this way, the milieu is a **process** of continual perception, understanding and acts. This process constitutes the milieu as such. **The milieu groups together in a coherent whole a production system, a culture and actors. The coherence between the various actors lies in their common approach to situations, problems and opportunities** (Crevoisier et al, 1989). The corporate spirit, organizational practices, corporate behaviour and the way in which technology is used (know-how) are all integral components of the milieu. It may be noted that this definition does not a priori refer to a geographical entity. However, the milieu is deduced from several elements which themselves have regional ties. It is in this connection that the milieu must not be confused with the region. Even though the

milieu spills over its borders in places, in particular when it maintains regular relations with some agents located on the outside, there are some elements (e.g. a branch of a major firm) which, although physically established in the region, maintain too few ties with it to form a part of the milieu.

Milieu and innovation

i) The perception of the milieu and of the environment

The systems of representation which create the regional milieu do not, however, develop solely in relation to the various elements of the milieu. It should be added in this connection that there is a second set which determines representations: the exterior, that is, everything that is outside the region. Indeed, one's self-perception is always derived from comparisons with others. This brings us back to the first concept of the milieu which is described above: the milieu as a framework for anaysis which defines simultaneously the interior and the exterior.

Two processes may thus be distinguished: the integration of activities is promoted within the regional milieu, while the process of differentiation is begun vis-à-vis the exterior (Crevoisier et al, 1989).

(a) **In the regional milieu,** the similarity of systems of representation makes for better communication between actors since problems are tackled in a like manner. In addition, these systems make it possible to integrate and inter-relate the elements of the milieu so as to form a more or less inter-related and finalized whole. This integration provides a means of increasing the intensity of relations and complementarities between the economic functions performed by the regional population (Planque, 1983). In this way, the effective heterogeneity of the milieu is reduced and differences or incompatibilities are inter-related. This integration makes it possible to relate the various elements of the milieu in a way which can lead to innovative processes. When this happens, one speaks of a network effect; this network is composed of all persons one either knows or can establish contact with and it can play a key role in the dynamic of a region, particularly with regard to corporate spirit, industrial diffusion and partnerships.

(b) **Outside the regional milieu,** this integration and network effect leads to a differentiation between the milieu and the other entities around it. The enhancement of local potential and the highlighting of the role of local entrepreneurial ability lead to an original model for regional development. This model implies that the fate of a region is not necessarily dictated by its natural resources or

ability to attract branches of major firms, but that it depends on its innovative abilities, creativity and will to act (Maillat and Vasserot, 1988). Today, when comparative advantages are a product of a specific make-up of labour and the milieu, one can say that this differentiation can lead either to innovative processes which highlight the milieu's resources, or to the preservation of obsolete skills.

ii) Representations and innovation

It is generally recognized today that innovation stems from the association of information and resources (capital, skills, corporate spirit, creativity). As we have seen, the milieu is centred round an integrated body of resources in the broad sense of the word. Nevertheless, some elements are missing from the milieu and must be found elsewhere. Innovation is thus the integration, into the milieu, of key resources. These resources may be generated by the development of the milieu itself or come from the exterior. The social and technological context is changing: new behaviour patterns and new paradigms are emerging. These changes in the environment are perceived within the milieu through systems of representation. This enables the actors to detect the tensions and convergences which will, over time and according to their point of view, lead to either problems or opportunities.

Representations provide a means of putting changes in the environment into immediate perspective. This leads to a direct relationship between the movements of the environment and the resources of the milieu, given that each actor integrates external developments and re-orders them in order to render them compatible and usable with regard to the elements of the milieu. Consequently, one can say that representations make possible, or prevent, the appropriation of external technological and social changes.

iii) Characteristics of the innovative milieu

Innovation is formulated as a process of integrating elements which are decisive to the milieu's resources. It therefore implies a recasting of the milieu's representations. The innovative milieu is characterized by the integration of internal dynamics and external changes. The problem is therefore to be posed in the following manner: the milieu, to be innovative, must fulfil two non-antagonistic characteristics, namely, opening up to the outside, and achieving a high degree of integration on the inside.

(a) The milieu is innovative because it is capable of opening up, of gathering information, or even resources, from the exterior. The milieu must therefore open up with regard to the diversity of the general context, remain aware of

and receptive to change so as to enrich itself. Yet this opening up implies risks, for how, in the mass of available information, can one pinpoint what information can be useful? How can one choose, among the infinite number of productive combinations possible, the most advantageous one? There is a danger of dispersing the energy and will of actors and using them up on methods which are already widespread.

(b) The milieu is innovative because its resources are organized, ordered and associated by means of economic, cultural and technological ties and the related representations. It is this process of providing order which makes resources usable in a new productive combination. It is also through the representations which the milieu has generated that one can apprehend and filter information and link them to the milieu's resources. The danger of an overly specific and overly integrated milieu is that too strong an emphasis on internal relations leads to closing off and, over time, to a loss of competitive ability. Innovation is thus strongly conditioned by the characteristics of the milieu. Among these characteristics is the degree of opening onto the exterior versus integration on the interior. The milieu is constantly torn between two antagonistic tendencies: opening and loss of its specificity on the one hand and closing off and depletion on the other hand.

Creativity is the process whereby the actors in a given milieu work out a new or original product which is suited to the constraints and purpose of the situation. The milieu can only achieve creativity when it meets these conditions of opening up/closing off, for it is at this moment that it supplies resources which can be mobilized and manages to link well-defined purposes to them.

The Inter-Relationship of the Two Types of Logic

Merely describing functional and territorial logic is not enough: today, there is agreement that each of these two paradigms describes a strong economic dynamic, that each has its strengths and weaknesses, and must accordingly be viewed within the same schema to arrive at a satisfactory explanation for regional dynamics (Pecqueur, 1987a; Soulage, 1986; Aydalot, 1986a; Gallianio and Gilly, 1985; Perrin, 1986).

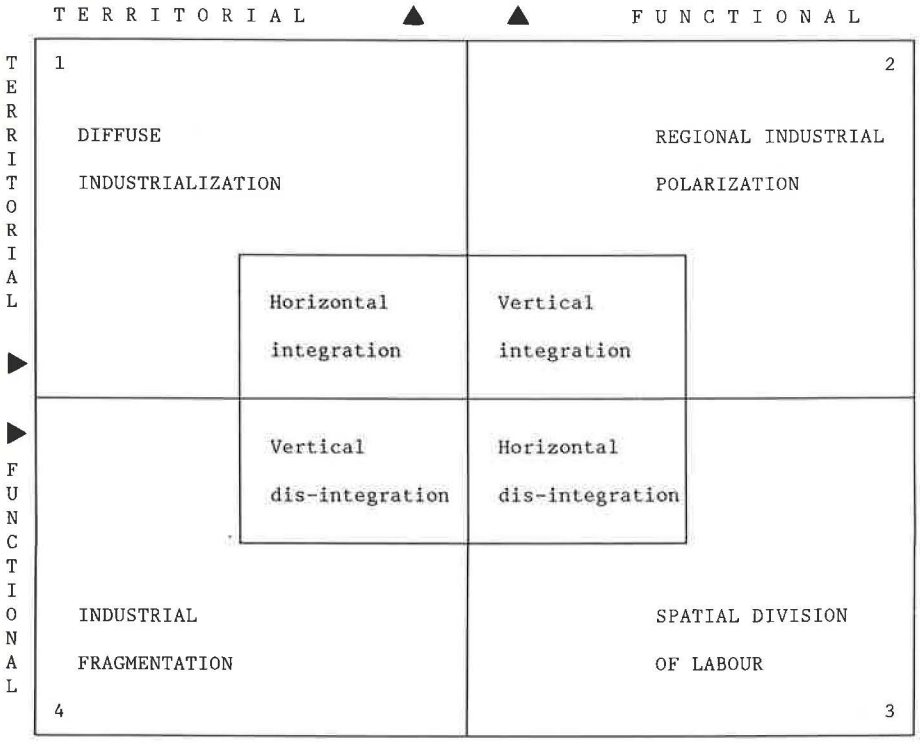
We may now see how material on the subject has dealt with the way in which these two types of logic inter-relate. At the same time, a recapitulative table attempts to systematize these various contributions.

Using an input-output table (Figure 2.1) which shows the four possible ways in

which the two types of logic can inter-relate (territorial>>territorial, territorial>>-functional, functional>>functional, functional>>territorial), it is possible to present a typology of industrial regions and regional trajectories. Given the present state of formulation of the functional and territorial dynamics, there is no unified theoretical framework. Consequently, this typology does not aim to be explanatory, but rather to show that, by going in this direction, it is possible to construct a theory explaining current spatial developments.

Before proceeding to a more detailed description of this table, some concepts need to be clarified, above all those developed by Ratti and D'Ambrogio (1989), which are based on a distinction between three different kinds of space for the company:

- **market space:** this is determined by the company's market relations, which are represented spatially;



Source: IRER/OC

Figure 2.1: Recapitulative table

- **the company's production space:** here, the aim is to describe the production segments and to localize them in the (highly probable) event that spatial division of labour occurs;

- **support space:** this describes the relations determined by the organizational characteristics of the production factor and by the elements of the company's strategy which concern its relations with its partners, as well as those which relate to ties with private and public actors.

This space is comparable to the milieu. (Ratti and D'ambrogio, 1989).

Second of these concepts, the system of Swyngedouw & Anderson (1987), is based on the intensity and nature of links in a region. A distinction is made between the four following types of regions and corporate strategies:

- **horizontal integration:** links exist between the various actors in the region;

- **vertical integration:** the actors in a region have organized themselselves around a sector, branch or major firm;

- **horizontal dis-integration:** the companies and institutions in the region maintain links separately with other establishments in other regions;

- **vertical dis-integration:** the companies in the region do not have links with each other, and are each organized autonomously.

Box No.1: Diffuse industrialization

By its nature and functioning, the territorial/territorial box corresponds to the regional milieu as described above. The system is based on representations and know-how which are constituted historically through the sharing of the same values, experiences and technological culture, and is subject to various competition/cooperation types of rules. This system favours entrepreneurship and innovation which take advantage of and enhance the resources and opportunities of the milieu.

The archetype of this category is Silicon Valley in the Fifties and Sixties. Today, the regions in northeastern and central Italy (the NEC model, Brusco, 1986; Fua and Zacchia 1983; Garofoli, 1986) are the best example. In Ratti's typology, this stage is the one where the support space is very developed and covers the production space. The market space is broad because most of the firms have direct contacts with the end market.

For Swyngedouw & Anderson, this is the case where there are many diversified links between the various actors in the region: this is **horizontal integration.**

Box No.2: The regional industrial pole

When an industry matures and mass markets develop, pressures to cut costs, combined with economies of scale, act as incentives for concentration and integration. The delocalization of assembly lines begins, taking advantage of the existence of low-wage zones, while R & D units are kept in central regions (Swyngedouw and Anderson, 1987).

When expressed in the terms used up to this point, this consists of a functionalization of the territorial dynamic. As firms undergo mutual structuring, **vertical integration** occurs. Although the support space remains very strong, we have left the area of an economy where the driving forces are primarily local and other economic spaces develop, especially the production space; the market space remains limited for most firms, since their main outlets are located in the region, and expands for those which are located the furthest upstream in the region.

This category covers regional industrial poles which usually have a long tradition of crafts or semi-crafts before they set themselves up as industries. Some examples are Peugeot in Franche-Comté, the watch-making industry in the Jura Arc in Switzerland (Maillat and Vasserot, 1987), Fiat in the Piedmont, Silicon Valley today, wool manufacturing in Prato, Italy, (Ritaine, 1987) and the iron and steel industry in northeastern England.

Box No.3: The phase of maturity and spatial division of labour

This phase is that of pure functional logic. It characterizes firms which have sufficient mastery over their technology to be able to delocalize production or research units in regions which offer localization advantages relative to these various functions - in particular, low labour costs.

This category covers regions marked by the spatial division of labour; central regions, such as Paris and London, where strategic functions are concentrated (management, research and marketing); and peripheral regions which have not mastered their regional development, such as Brittany, Ireland or the Mezzogiorno in Italy.

There are no internal ties in these regions; the production space has been broken up to take advantage of wage differences, while the market space is vast and is controlled by major firms located upstream. The support space breaks up into

partial segments (Ratti and D'Ambrogio, 1989). This corresponds to **horizontal dis-integration.**

Box No.4: The industrial redeployment phase

Today, major firms, rather than delocalizing a single function - manufacturing, research, etc. - as in the spatial division of labour, are tending to create companies which completely dominate production from conception to sales. These are all **fragmentation** strategies (Shutt and Whittington, 1987; Maillat, 1988) or **vertical dis-integration** strategies used by major firms.

There are two ways to territorialize a company:

First, major firms localize subsidiaries in the same place, as is the case with Sophia-Antipolis in the south of France. Relations between these enterprises and the parent company may take several forms:

- **'Decentralization** of production: large plants are broken up, but retained under the same ownership, by hiving off into smaller plants or by creating new subsidiary companies;

- **Devolvement:** large firms cease to own units directly, but retain revenue links with them, i.e. licensing or franchising;

- **Dis-integration** of production and innovation: large firms cease to own units of production or innovation, but retain control through market power (...) or, latently, through the power to repurchase the units'. (Shutt & Whittington, 1987, p17).

In this case, the support space is something which is planned by large firms, i.e. the idea is to take advantage of the presence of several enterprises in the same place, for example, to set up training structures, develop infrastructures to make it easier for technicians and their families to settle there, etc.

The second way of re-territorializing capital consists of taking over small, innovative, fast-growing firms. In France, large industrial groups have set up complex strategies to track dynamic small and medium-sized companies in order to encourage them to cooperate to the point of letting themselves be taken over. This is what Perrat (1987) calls capital regionalization. Moreover, this phenomenon is facilitated by the fact that this type of firm has difficulty securing funding to finance its growth (Planque and Py, 1986).

Autonomous regional development

An in-depth study has been done on the topic of autonomous regional development (Perrin, 1974). This theory is divided into three phases: start-up, polarization and deconcentration. The first phase takes place in areas with a crafts base which develops and where new firms are set up; this phase corresponds to industrial diffusion. However, the birth of production centres is not enough; diffusion must develop and spread. The second phase is a strengthening and structuring of the industrial system, which becomes capable of ensuring its own expansion in an autonomous fashion and over time. Lastly, the third phase is deconcentration which occurs when activities are allocated according to regional specialization.

We can thus see that this series of stages corresponds in the table to a shift from Box 1 to Box 2, and from Box 2 to Box 3. Some critics of this schema (Brun, 1985b) say that this system deals with the development of an infant industry, and that, in the case of developed countries, the first phase does not exist. Yet one may wonder whether cases such as northeastern and central Italy are not precisely an example of a new type of territorial dynamism in a developed country. Finally, it is true that this type of schema does not take into consideration the growing complexity of the productive system and of the development of new activities from existing industries. In our opinion, the incorporation of a fourth phase, i.e. vertical dis-integration would make it possible to take such factors into account. When major firms try to establish themselves in fields which they do not master, they avoid relying on the functional division of labour. They buy up high-growth small or medium-sized companies in this field, or set up a firm ex nihilo. The best illustration of this is what has been happening in recent years with robotics. Automobile manufacturers, which were and remain by far those which have the greatest use for robotics, either moved into production - as was the case with Renault and its failed experiment with Renault Machine Tools - or bought up autonomous firms.

As we can see, some regional trajectories may be plotted on the table by moving from one box to another. However, care must be taken not to read any kind of determinism into theories such as those of autonomous regional development or the product cycle applied to regions. A milieu can transform itself and move from one box to another, but this is rarely the case.

Conclusions

Today, the construction of a globalizing theory on spatial dynamics must take into consideration the new mechanisms which have been presented and grouped

together in this paper under the idea of milieu'. Moreover, these mechanisms are giving rise to so much theoretical and empirical research that it would be unjustified to consider them as negligable. However, one must not think that the forces which have by and large determined spatial economic dynamics over the past forty years are no longer at work. Furthermore, visions which hold that the local or regional level is the sole economic driving force have been denounced, and rightly so, on many occasions. Today, the best solution seems to be to look for a formulation which can cover the two paradigms in a coherent way, without considering them as **a priori** antagonistic or incompatible. One way would be to start with an analysis of the regional production system, to conceive of it as an object with a certain amount of autonomy - at the level of inter-industry relations, know-how, technology, etc. - and to determine how this system is mixed into the international dynamic while remaining a full actor.

In any event, thoughts on this subject should also be extended to cover the search for more appropriate policies. The schema depicted shows that the spatial behaviour of firms varies according to their situation and the elements on which they rely in the region vary accordingly: a firm which applies functional logic will, above all, be interested in a policy of spatial redistribution of activities, in particular subsidies and tax advantages designed to attract firms; in the case of diffuse industrialization, a company will be favoured by measures designed to promote revitalization, such as innovation aid, the creation of company think-tanks and training efforts; a region which is in the integration phase needs institutions to provide guidance, such as technological supervisory bodies; as for regions which welcome establishments which are relatively independent of large firms, it would be interesting to study how ties and locomotive effects could be created between these establishments, for example, through regional activities.

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