

PL-ISSN 0866-9708

INSTITUTE OF GEOGRAPHY AND SPATIAL ORGANIZATION  
POLISH ACADEMY OF SCIENCES

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# CONFERENCE PAPERS 24

## URBAN AND REGIONAL ISSUES IN GEOGRAPHICAL RESEARCH IN POLAND AND ITALY

**Proceeding of the Seventh Polish-Italian Geographical Seminar  
Warsaw - Wierzba - Toruń - Łódź  
27 IX - 2 X 1993**

Edited by

Bożena Gałczyńska  
Grzegorz Węclawowicz



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## *Foreword*

This volume contains revised papers presented at the 7th Polish-Italian geographical seminar which was held in Poland between 27 IX and 2 X 1993. Paper sessions as well as field sessions took place at Warsaw, Łódź, Toruń and Wierzba — a conference centre in Mazurian Lake District in north-east Poland.

The seminar brought together 24 participants from the Universities of Pisa, Pescara, Venice and Trento on the Italian part, and from the Institute of Geography and Spatial Organization of the Polish Academy of Sciences; the Universities of Łódź and Toruń, on the Polish part. The meeting represented a step in the long-standing scientific collaboration between Italian and Polish geographers.

Papers presented at the seminar focused on urban, economic and social geography. The following topics were represented: structural change within metropolitan areas (B. Cori); urban diffusion on a local scale (M Costa); methods to study the so-called urban relation potential centre (M.R. Arnoldi); service location in urban areas (G. Zanetto, S. Soriani); time geography (J. Kaczmarek); geography of crime (W. Maik); spatial differentiation of living standards in cities (S. Kaczmarek); urban and regional electoral geography (G. Węclawowicz); the growth and decline of small business in a metropolitan periphery (E. Iwanicka-Lyra). Papers devoted to rural topics dealt with the educational standards among the rural population (B. Gałczyńska), and with definition of depressed rural areas (R. Kulikowski).

The man's role in the transformation of the landscape was discussed in the papers by F. Di Donato, M. Fuschi, and regionalism issues in Poland by Z. Rykiel; E. Lemmi and G. Spinelli presented a summary accounted of the result of scientific collaboration between Italy and Poland against the background of more broadly defined cultural relations between Eastern Europe and Italy.

The seminar provided a good evidence of the steady evolution and progress of urban and rural geographical studies in the two countries. It also allowed one to identify the results of the collaboration and to identify some topics of common interest for further study.

*Piotr Korcelli*



## PRESENT LAND USE COMPETITION IN METROPOLITAN AREAS: THE CASE OF TUSCAN URBANIZED AREA\*

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**Abstract.** The increase of space demand for human use in world wide scale is confronted with the land use competition in urban areas of Tuscany. This paper arises from the crossing of three stimuli: 1. the worry about the increasing land use for purposes which are neither for production nor for investment, but for mere consumption; 2, the recognition of the consequences on land use as a result of increasing human mobility; 3. the new perspective suggested by the "four urban population" hypothesis (Martinotti 1991).

**Key words:** land use, competition, Tuscany, population density, urbanized areas.

The first stimulus is the best known and the most vexed (see, for instance, Reho & Santacroce 1990, with a wide international bibliography). It has been realized since a long time now at all geographical levels (world-wide, continental, national, regional...) there is no potential balance between the static character of physical spaces and the quantitative growth of human use of these spaces. To a physical space which is constant, or may increase only insignificantly as in the case of Dutch polders, corresponds constantly increasing man's land use: firstly, because of the population growth, and secondly in a consequence of the rise of per capita space demand. Nowadays, in developed countries population is, as everybody knows, stable or characterized by a very slow growth; additionally the process of spatial concentration has practically stopped in result of the counter-urbanization phenomenon, which may be differently interpreted but which cannot be disputed; and yet per capita space demand is rapidly increasing, more intensely than previously.

In the past, the space demand was considered mainly: 1, as a need for physical space for dwellings and settlements, a necessity which could be solved through the artificial multiplication of space through more than one built-up level, but that at the same time was a potential producer of urban congestion problems, housing shortage etc. (in the urban concentration period); 2, need for productive space for essential consumption, particularly for food production (during the period characterized by fear concerning the problem

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\* This research was made possible thanks to a grant from Italian Ministry of University and Scientific Research (60%, 1992).

of food supply for the world population). In the past, in other words, the old geographical concept of “population density” was essentially interpreted as “accommodation density” (square metres per inhabitant) in the urban areas, and as “nourishing density” (square metres needed for the production of a quintal of wheat, or potatoes etc.) in the rural areas. Hence, there were studies concerning urban deconcentration on the one hand, and studies concerning the Earth’s population capacity on the other.

Today, the problem of urban gigantism is played down (in developed countries), and the problem of food production is more correctly interpreted in qualitative and distributive terms. Physical space seems to have lost its nature of critical variable for the main needs of life (to inhabit and to feed). In particular, in metropolitan areas, which are our concern, population is generally diminishing and needs for rural productive space concern us not so much as agriculture becomes more effective, and manufacturing industries are gradually reduced and moved out of towns as, to a certain extent, also tertiary activities (office premises: see, for instance, Mérenne-Schoumaker 1991). Nowadays, the essential space demand, at least in urban concentrations, mainly concerns consumption and infrastructure in direct services to the population.

We might formalize this situation, for a given area  $A$ , with the equation:

$$A = P \times D + R$$

$$A = P_1 \times D_1 + P_2 \times D_2 + P_3 \times D_3 + \dots + R$$

where:

$P$  — is the population of the area,

$D$  — the per capita space demand (for direct consumption and infrastructures), and

$R$  — the residential space used for production (agricultural, industrial and tertiary).

The question I am asking myself is the following: should we or should not we worry about  $D$ ’s growth and the consequent progressive reduction of  $R$  (given that  $P$  is realistically constant)?

A very wide debate, as well known, has been raised on this subject, which has identified three reasons to worry about as regards  $R$ ’s decrease. I shall briefly summarize them in a historical order:

1. If  $R$  is reduced, the agricultural production space also decreases; this has little importance on a world-wide level, since the hunger problem in the world depends more on financial disproportions than on physical production shortage; it is even desirable on a European level, where agriculture renders, if any, problems of overproduction. Anyway, it remains a problem for a country with agro-alimentary commercial balance deficit, like Italy.

2. If  $R$  is reduced, the ecological space of nature decreases, the “cemented” — and, therefore, impermeable — tarred surface grows larger (Cervellati 1984, ch. 4), chances of pollution increase, natural green reserves become less extended, clean water supplies get reduced, the risks of hydrogeomorphologic unbalance become more likely, together with the possible calamitous consequences of natural events.

3. If  $R$  is reduced, the natural elements of landscape, the rural qualities, the panoramic characteristics, the symbolic values of open spaces, the identity and the perceptive meaning of places are reduced.

There are, therefore, three reasons: the first is economic, the second ecological, the third generically connected with the concept of "quality of life" which, even though still hazy, is becoming more and more important as a rising paradigm in social and spatial sciences.

The second stimulus is generally less considered. Everybody knows Georg Simmel's paradoxical statement (quoted by Micheli 1988, p. 7): in the whole world there are only fifteen people, who, nevertheless, move so rapidly that it seems as if they were many more. In a probably unconscious way, those who were responsible for the Italian expeditionary force to Libya, in 1911, and who ordered soldiers and sailors to come continuously in and out of buildings and military encampments in Tripoli, in order to make the Turkish-Arabian enemy believe that they were faced with numerically conspicuous forces, got inspiration from Simmel. And yet, the role of  $P$ 's "movement" seems to me to be constantly underestimated by those who are concerned with space. The economists, on the contrary, know only too well, for instance, how the inflation rate equally depends on the existing monetary mass and on the "speed" with which it is circulating.

Personally, I have the impression that the Earth's fifteen inhabitants are moving — not withstanding the illusion that telematic progress can substitute mobility for information and communication (Fiorelli 1987, p. 485) — more and more, and faster and faster, so considerably contributing to the increasing  $D$  variable.

Let us consider, now, the third stimulus. Martinotti's remarks (1991) throw new light on the previously advanced equation, by suggesting a division of the "generic" population  $P$  into specific populations:  $P_1$  (inhabitants),  $P_2$  (patients in hospitals),  $P_3$  (tourists),  $P_4$  (students),  $P_5$  (commuters for work-purposes),  $P_6$  (commuters for services),  $P_7$  (businessmen)..., each one with its respective per capita space demand. The equality, then, becomes

$$A = P_1 \times D_1 + P_2 \times D_2 + P_3 \times D_3 + \dots + R$$

(still supposing that  $R$  has something left...).

At this point, I would like to try to evaluate the dynamics of  $P$  and  $D$ , or, better, of the various  $P$ s and  $D$ s, for a concrete and specific metropolitan area, that which may be defined as the "Tuscan urbanized area", or, in shorter terms, the "Tuscan conurbation" (Cortesi 1988; Costa 1988) (Fig. 1). This area includes the six north-central provinces of Tuscany, together with the province of La Spezia (which is closer to them, under many viewpoints, than to the provinces of Liguria); even if there is a wide mountainous and hilly, scantily populated area with about three million people living there, mainly in urban though remarkably fragmented forms, over a surface of 12,000 square km, stretching from Valdarno to the Tyrrhenian coast, the average approximate density being 250 inhabitants per sq.km.

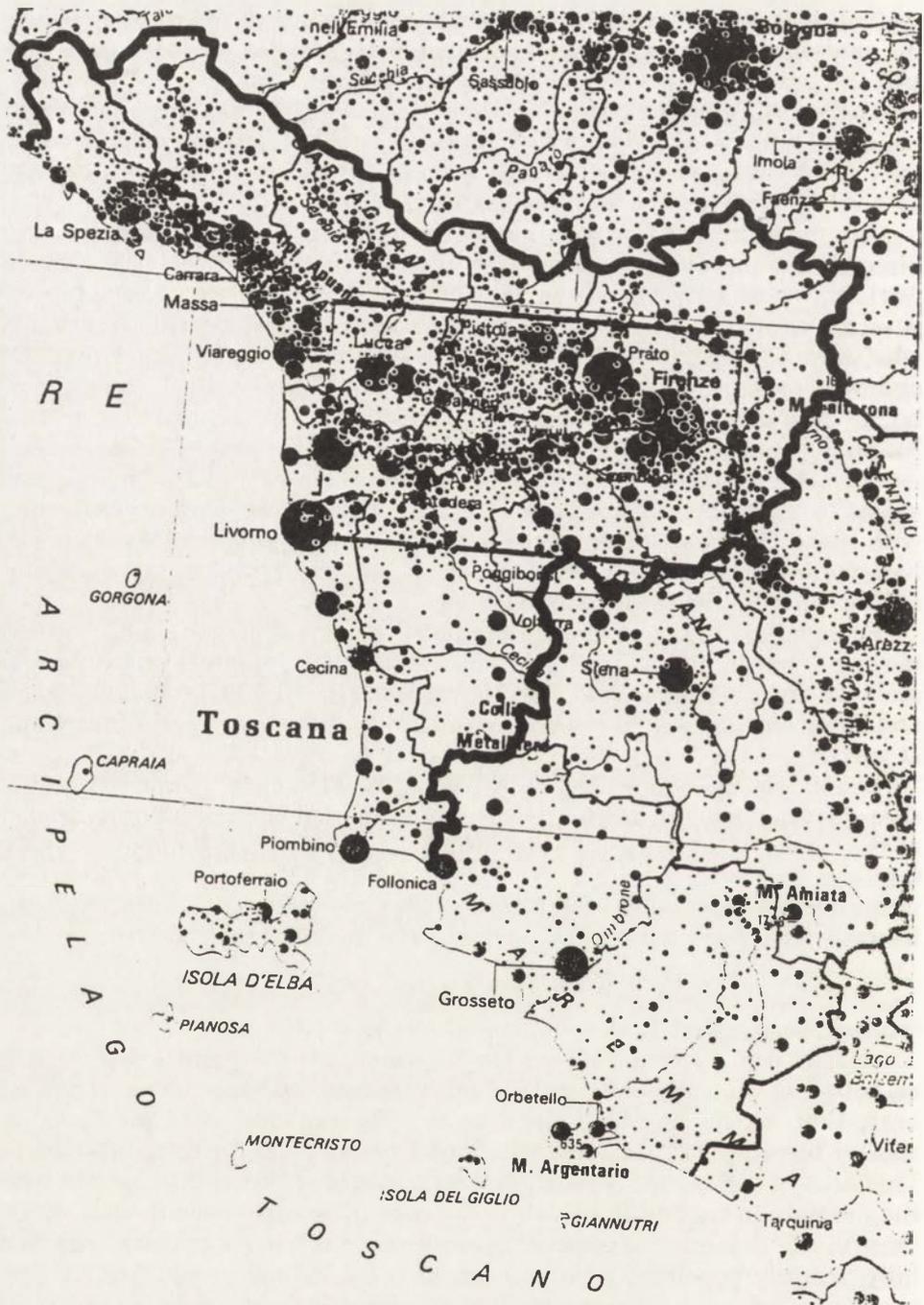


Fig. 1. The Tuscan conurbation

This area shows conditions which are fairly representative for the whole of North-Central Italy, and, in regard to the demographic dynamics of the last thirty years, also for many European developed regions. Its population moderately increased until the end of the Seventies (+11% between 1961 and 1981), and then remained substantially stable (with a slight decrease between 1981 and 1991) (Table 1). However, this population significantly increased its housing demand, by provoking a considerable growth of the permanent building stock, and an even more extraordinary rise in the number of temporary lodgings (i.e., second homes). If we consider the population in the traditional meaning of the term only, namely the resident population ( $P$ , in the first equation), its per capita housing space demand ( $D$ ) has significantly grown-up (Fig. 2).

Table 1. The dynamics of Tuscan conurbation development

	1961	1981	1991
Area (sq. km)	12,323	12,323	12,323
Population ('000)	2,726	3,034	2,976
Rooms ('000)			
inhabited	2,893	4,452	4,850
vacant	269	810	953
Vehicles ('000)	186	1,314	1,802
Patients ('000) in hospitals	303	581	444
Guests ('000) in hotels etc.	2,228	4781	5,197
Univ. students ('000) (Pisa + Florence)	18	70	93

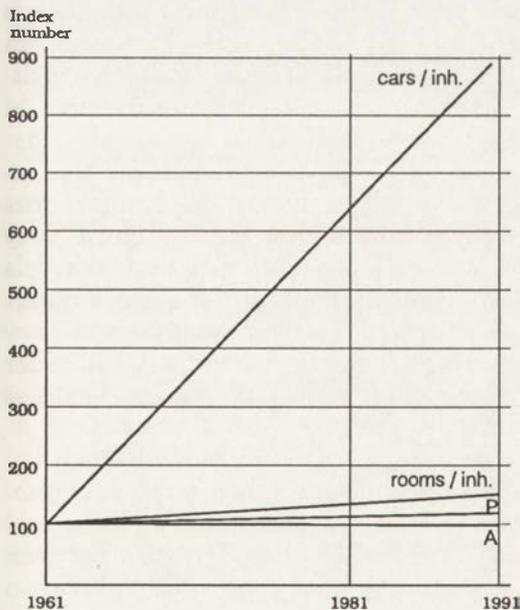


Fig. 2

But the growth of its mobility demand is much more significant, if we measure it through the rise in number of registered motor vehicles (Fig. 2).

On the other hand, if the resident population ( $P_1$ ) is stable or characterized by a very slight growth only, the dynamics of the "other" population have quite different features: in this area, the number of patients in hospitals ( $P_2$ ) increased by almost 50%, between 1961 and 1991; the number of guests in hotels ( $P_3$ ) increased 2.3 times; the number of students in the universities of Pisa and Florence ( $P_4$ ) quintupled (Table 1, Fig. 3).

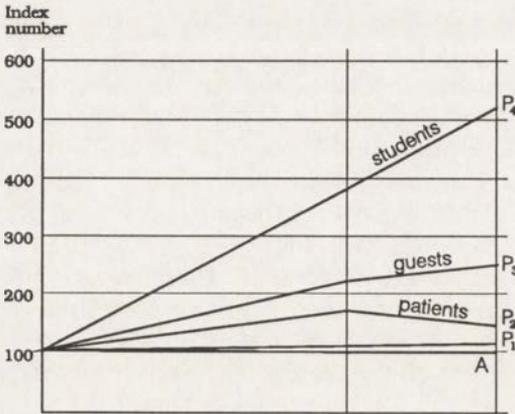


Fig. 3

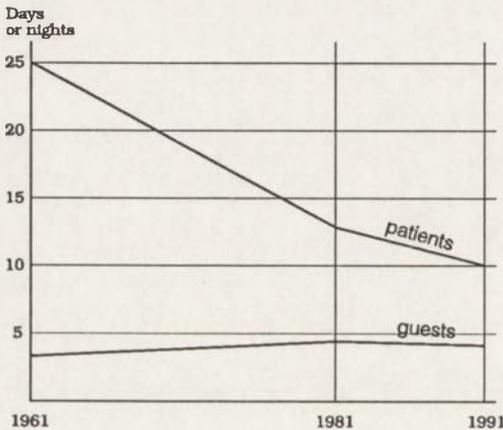


Fig. 4

However, unlike  $P_1$ , which is a population that does not grow numerically, but that increases its own need for per capita space, the other populations seem to reduce these needs. This can be argued from the very moderate growth in the average number of nights spent by tourists in hotels (a parameter which might represent  $D_3$ ) and from the considerable decrease in the average number of days spent by patients in hospitals (a parameter which might represent  $D_2$ ) (Fig. 4). Therefore, the growth of the space occupied by the various Martinotti's populations follows substantially parallel lines, but these lines are connected with a different contribution of factors: the  $D_1$  factor becomes increased in the case of  $P_1$ , the  $P_2$  and  $P_3$  factors (with  $D_3$  less dynamic and  $D_2$  even in decline) in the case of the "visiting" population of the area in question.

Anyway, whatever the increasing factor is, the result, that is to say the product of the factors, turns out to be increasing anyhow. It can be presumed that this statement may also hold good for population whose size at reasonable temporal intervals we cannot yet know — for instance the incoming commuters for work-purposes ( $P_5$ ) — or for population in case for which specific surveys would be necessary — for instance, the population gravitating around towns and cities in order to use their commercial, banking, educational, entertainment etc. facilities ( $P_6$ ).

The above briefly described local case suggests three general remarks:

1) The problem of space demand becomes increasingly a problem of competition in land use: not only between residential/consumption uses and production uses, or between "urban" and "rural" uses, but also between different residential and consumption uses of the same population, or between uses required by different populations.

An example of the first kind of competition is that which is in progress between motorists and pedestrians in our towns (a wide survey of which has been studied in Pisa and Lucca) both from the static viewpoint — occupation of pavements by motor vehicles — and from the dynamic viewpoint — practical obsolescence of crosswalks (Cori 1988). Some episodes of an underground war between pedestrians and motorists — members of the same population  $P_1$  and bearers of two different conceptions of mobility — are quoted by the daily press in several Italian towns. An example of the second kind is constituted by the tension created on the land and rent market by the presence of institutions such as universities and of a temporary but not commuting population of students (a remarkable share of  $P_4$ ), especially in towns which are undersized with respect to the phenomenon in question. Pisa is a typical example; a large part of its central area (more than 10%) is occupied by university buildings, and more than 10% of its resident population is made up of students. The consequences, such as the driving out of certain categories of inhabitants (being a part of  $P_1$ ) and certain specific land uses, practically disappearance of mechanisms such as the “fair rent”, are easily intuible. We know about a similar competition from various sources (see for example Mérenne-Schoumaker 1991) which involve residents and businessmen ( $P_7$ ) because of the expansion of built space absorbed by office premises and professional studios in central urban areas.

2) It becomes more and more pressing to devise quantitative evaluations concerning not only the populations but also the surfaces they require or make use of. The data which have so far been collected are at the same time uncertain and reassuring. The uncertainty derives from the shortage in Italy (but also in most of the other countries) of statistic data capable of being at the same time reliable and applicable to the space as a whole. At the moment, we cannot know even the relatively simple measure of urbanized surface. It is therefore necessary to proceed on the basis of evaluations and stratagems.

For instance, in the Tuscan urbanized area previously proposed as a case study, one can approximately calculate the space occupied by inhabited and non inhabited houses, by national and provincial road network, and by cars, by applying presumptive parameters (30–40 sq.m. per room, 6–10,000 sq.m. per road kilometre, 12 sq.m. per car). Relatively scanty data are obtained, which are of the order of tens or, at most, a few hundreds of square kilometres, with respect to the 12,000 sq. kilometres of the area in question. The only possible global calculation, that based on land use statistics prepared for agricultural purposes, which nonetheless requires certain devices and leads to rough evaluations (widely discussed in Reho & Santacroce 1990, esp. pp. 24–49), gives about 1,100 sq.km. of urbanized surface (that is to say, residential and productive settlements plus all kinds of communication lines) as a result for the year 1988. It should be said that this figure shows a singular correspondence with that European average of 350 sq.m. of urbanized surface per resident inhabitant, which is proposed by several sources (Fiorelli 1987, p. 482), and with the even more general hypothesis according to which in

developed countries the “normal” share of urbanized space corresponds to about 10% of the global surface.

If one considers that these values, whether they are absolute or relative, include not only the spaces absorbed by residential and consumption use, but also those which are reserved for the production of industrial goods and services (therefore representing a part of *R*); and that, even though they refer to the resident population, they include the occupation of space concerning other kinds of population (hotels, hospitals, schools, job premises etc.), they seem absolutely reasonable, substantially leaving nine tenths of space to the uses that can synthetically be defined, reassuming the above-mentioned three features, “agricultural, ecological, and panoramic”.

3) My remarks might end here, in a substantially optimistic way, if there were not the immediate suspicion that the problem should be posed not only on the chorographic scale here adopted, but also on a larger scale; and that the practice — well known to geographers — of the continuous shifting of scale should be considered not only as a sort of intellectual game of Chinese boxes, but also as an extremely realistic way of facing spatial problems. There are still those, today, who wonder, or perhaps feel reassured, by observing that in Gottmann’s megalopolis the woodland surface is more extended than the urbanized one. But this does not prevent the appearance of sharp problems of land use competition, land consumption, or even land waste or stifling, in limited areas of the same megalopolis. It is therefore necessary, together with some sort of improvement of methods and parameters, definitions and measures, to carry out a further analysis within the area which has so far been proposed as field of inquiry: for example an analysis of the triangle, intended in a truly geometrical way, which stretches between Florence, La Spezia, and Leghorn, or of the set of communes in the area (45 over 216) which exceed the population density value of 400 inhabitants per sq.km.

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## PROPOSALS FOR AN INDICATOR: THE URBAN RELATIONAL POTENTIAL

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**Abstract.** The importance of telecommunications in influencing new urban dynamics — that is, the new competitive dimensions of the city — has prompted the use of the traditional model of the urban economic base in a version adapted to a “society of telecommunications” to interpret the functioning of city systems according to competitive logic. For this purpose, a synthetic indicator is used which assigns a ‘weight’ to each town according to the share of its telephone consumption relative to the two SIP categories of user: ‘businesses’ and ‘households’. The indicator relative to business consumption is therefore assimilated to that of ‘base activities’, and that of family consumption to residential activity, according to the paradigm utilized in classic UEB theory. It was possible to define as ‘relational potential’ of a centre as the proportion between the two different volumes of communications: this, by ‘weighing’ the relational density of economic activities, provides an approximate but correct definition of the ‘exogenous’ features of an urban centre. The results obtained by applying this indicator to two Italian regions suggest that the model should be developed further.

**Key words:** urban relational potential, urban system, communication capacity, telecommunication, urban dynamics.

### INTRODUCTION

The economic importance of information — “the single factor most responsible for economic and social development” — (Abler 1974; Hepworth 1989) and its role in influencing the spatial pattern of cities and regions has recently directed the interest of geographers towards the geography of telecommunications, in particular those tied to new technologies.

According to literature, information — and the services connected with it — has assumed a fundamental importance in the problems of regional development and of regionalization, to the point that “it constitutes the founding concept and explanatory modality of territorial disequilibria” (Bakis 1987, 1992; Mura 1988).

Moreover, information technologies can be understood as innovations tout court, whose introduction into the economic system and adoption by firms is the cause and consequence of cumulative processes (Antonelli 1989): in fact, “the circulation of information is an indicator of the way in which

innovation is diffused, and the processes which structure the organization of the territory are consequently defined" (Vallega 1982).

Telecommunications therefore mark (and help to plot) the lines of organizational power in a physical territory, and they directly influence the evolution of geographical space (Bakis 1992): but although the organizational capacity of a territory certainly correlates with its communicative capacity, "the problem is to know how telecommunications exercises its influence" (ibid., p. 307).

Among the numerous and various aspects of the interrelation between telecommunications and territory, the most important is the city-telecommunication relation, and this concerns organization and urban development in particular. As Bonavero reports in a recent survey, scholarly attention to this topic has mostly centred around two theses ("megapolitan" and "antipolitan"), the former hypothesising the diffusion of only certain functions in the territory, the latter envisaging the dispersion of all urban functions in the territory. Recent results seem to uphold the megapolitan hypothesis, that is, the new technologies of telecommunications "seem overall to repropose phenomena of urban polarization" (ibid., p. 464).

The selective endowment of new telematic technologies therefore distinguishes the centres emerging in the network from centres which produce and consume 'advanced' information services: a hierarchy which, defined in terms of internationalized functions, is much shallower than a hierarchy defined in terms of all the economic functions (Reclus-Datar 1989; Camagni 1991, p. 55).

The study of the influence of telecommunications on urban development stresses agglomerative tendencies of 'advanced' telematics ("...the great development of networks ... tends to concentrate the great elaborators and centres of information management at points which today are already the best equipped") (Lanza Dematteis, '88): compared with the increasing endowment in telecommunications which distinguishes the large city, relatively little explored is the behaviour of centres and subcentres which now have virtually real-time access to the information resource and are thus able to reduce the friction of distance: even smaller towns have been enabled to undertake globalization and to acquire a new competitive dimension. The features most responsible for the new physiognomy of the city (medium-small size cities) and of its hierarchical position are — on account of the well-known transformations now under way in firms' behaviour — to a large extent influenced by its ability to communicate; that is, its capacity to enter the new systems of relations crucial for the renewal of productive processes (Kamann-Nijkamp 1988).

Within this context, the characteristics of the new patterns of spatial structuring are closely conditioned by the capacity to handle the new systems of access to strategic information provided by technological innovation (in both the economic-productive and administrative spheres): "The control of the market of outputs, inputs and innovative assets is performed by the firm not only in terms of management of a gravity area, but also and increasingly in terms of networks relationships" (Camagni 1991, p. 60).

At the present stage of research, therefore, "it will be possible to identify the configuration of individual urban-based territorial systems by verifying

exogenous qualities, i.e. the relational features of centres" (Camagni, cit.). According to this view, the intensity and the importance of the relations established by the city amply testify to its 'degree of openness' towards the outside, and account for the way in which it reacts to the stimuli furnished (imposed) by modernization.

Hence, on the assumption that "*information flows should be the central element in the definition of urban systems*", which exists and is strategically justified as a node of exchanges, in particular exchanges of information, and consequently of decisions and transactions" (Harris and Ullmann 1945; Gottman 1970; Thorngren 1970, cit. in Pompili 1993), attempts have been made to identify, and in some way synthetically to measure, *the relational capacity of centres as a yardstick of integration* or, at any rate, "capacity for competitive inclusion in a more general urban system" (Pompili, cit., p. 190). For this purpose, we decided to find an indicator which assigned a "weight" to a town relatively to its "communicative capacity" (and, also, its degree of openness towards the outside), and it seemed to us that this indicator can reasonably be taken to be the volume of telephone consumption.

Given the advantageousness of differentiating data not only according to the number of subscriber households, but also of work environments, we used — naturally in an exploratory fashion and with many interrogatives — the interpretative paradigm used by classic urban economic base theory. The only one that has so far enabled interpretation of city systems according to competitive logic, and which is currently regarded as providing the most satisfactory explanation of the actual position of city as subject to the influence of telecommunications.

Accordingly, we tried to define the relational features of a centre using an indicator which — after comparison between the two volumes of flow — defined the greater or lesser importance of flows deriving from economic activities compared with others. This study presents the first results obtained by applying the indicator to two Italian regions.

As a first result, *it furnishes an interesting pattern synthesizing the relational capacity of a urban system*: the use of this indicator in defining the structure of urban systems enables the measurement of performance on a level — the relational level — that amply testifies to modernization capacity. By characterizing the urban system in this way, it is possible to conduct comparative analysis of different urban systems and to establish similarities and differences.

This holds both for previous hierarchical patterns and for comparison among different territorial areas.

The aim of the study presented here was also (1) to identify a reliable indicator to assess the 'relational potential' of centres, and (2) to verify the usefulness of this indicator in definition of a configuration of the urban system which revises or confirms the traditional hierarchical pattern of the early 1980s. The study involved comparative examination of two different territorial structures, those of Lombardy and Sicily, two region-types chosen because they are macroscopically representative, in Italy, of the dualism in the country's pattern of development.

## THE INDICATOR USED. URBAN RELATIONAL POTENTIAL

### ELEMENTS FOR A DEFINITION

Identification of a synthetic indicator of the relational features of urban centres is a complex area, one which is difficult to delimit, and faced with which (also because of the recent, tumultuous growth of this sector) geographers must "adjust their instruments" (Hepworth 1987).

'Information economy' has yielded a series of conceptual insights which are consolidating into a theoretical 'corpus', although they are still not adequate methodologically (Hepworth 1989).

At the empirical level, the variables used by the numerous studies carried out so far relate either to the quantity of flows of TLC among various areas, or to infrastructure endowment, or to the size and features of consumption in various areas (Bonavero 1993): all indicators used insofar as they are "representative of the level of economic development achieved by the various territorial contexts" (ibid., p. 459).

In the Italian case, this type of research is not greatly practiced by geographers, who, as seen from the above-mentioned bibliographical surveys (Bakis 1992; Bonavero 1993), have concentrated instead on new information technologies or on analysis of flows among cities (Antonelli 1989, 1992; Bonavero 1992; Diappi Stabilini 1993; Lanza Dematteis 1987, 1988; Mainardi 1988; Menegatti 1985; Pompili 1993).

Although obviously in agreement with this line of research (of particular interest is analysis of flows in relation to the new theoretical paradigm of city networks: Camagni and Di Blasio 1993), I considered it important to bear in mind that, in Italy, "communication systems are still *substantially* based on the telephone network" (SIP 1992), (1) (even though SIP forcefully asserts "the need to accelerate the passage to the wider range of products and services made possible by the integration between technology and information science") (2). At Italy's present stage of technological development, therefore, the implementation in its spatial system of advanced telematics still only concerns a small area of the country in quantitative terms ("... we are only at the beginning of processes activated by 'information technology'", and "only a relatively small number of firms and regions are able to take part in this process", Antonelli 1989, 1992).

Against this background, and as a first step in this relatively under-explored direction of research, it seemed more productive to adopt a theoretical approach in which the characterization of the centre on the relational level is explained by the 'weight' relative to the volume of communication flows.

The data selected with which to identify the 'communicative capacity' of centres were therefore SIP data relative to the Italian telephone network (SIP 1990), bearing in mind:

— the possibility of differentiating the data not only according to the number of subscriber households, which measures the use of the telephone by the resident population (the 'classic' indicator: Guerard et al., 1979), but

also according to telephone use in work environments (telephones are installed wherever business or professional activities are conducted);

— relative to these parameters, considered an even more reliable indicator of the phenomenon was consumption (no. of units per 100 inhabitants). All the data, moreover, were available on a communal scale (SIP 1990).

The following parameters were used:

Aa → number of subscriber households

Al → number of subscriber work environments

Ca → amount of household consumption (monthly units per resident)

Cl → amount of business consumption (monthly units per inhabitant)

The study therefore assessed individual centres from a specific standpoint whereby a 'weight' was assigned to each town on the basis of the above variables, which were taken to express its 'relational potential' (Arnoldi 1989).

It should be immediately pointed out that the term 'potential' does not relate to the concept of potential as conventionally used by geographers (Isard 1962) (and which has been subjected to a series of redefinitions, albeit simply as regards the etymon, as "characteristic magnitude of particular fields of forces": Zingarelli 1970). This means that the measure of the relative capacity of a centre is obtained from values which are indeed expressive of gravitation phenomena, but are not obtained by using classic analysis of gravitational processes.

#### PROPOSALS FOR AN INDICATOR

The theoretical framework for construction of the indicator used in the study was taken from the conceptual apparatus of the urban economic base; a model which, among stylized models of city development, allows interpretation of the functioning of city systems by means of competitive logic (Camagni, Gibelli 1993).

As is well known, the model distinguishes in a simplified manner between activities "which shape the specific features of the city, its specialization and its role in the spatial division of labour" and activities "which sustain the urban population engaged in the former" (Camagni 1992).

The dichotomy underlying the model (as early as 1902 W. Sombart distinguished between *Städtegründer*, base activities, and *Städtefüller*, activities of completion) has oriented a by now consolidated range of versions characterized by their evident macroeconomic derivation and by their concern to *define a measure of external competitiveness* (Haggett 1988; Lloyd, Dicken 1984; Camagni 1992).

According to this definition, if the degree of a city's connectedness is a function of the centre's competitive performance (Kamann and Nijkamp 1988) and telecommunications the key factor in its new competitiveness, one can — *exploratively* — reasonably assimilate this indicator to the one relative to base activities used by classic theory, considering the relational potential of households as connected with the residential size of a centre, and the

relational potential of workplaces as expressing the role played by information as a base activity in the current phase of development.

Considering the 'mass' formed by the product subscribers/units of consumption, we have:

1.  $Aa \times Ca \rightarrow Pr, a$  — Relational Potential Households

2.  $Al \times Cl \rightarrow Pr, l$  — Relational Potential Work

If the distribution relative to  $Pr, a$  (consumption/household indicator) is assumed to be directly correlated with the demographic size of centres ("the telephone is now a device banal diffused among households, and the figures relative to total telephone use are too closely correlated with the population to permit significant differences among centres": Bellotti et al. 1991), it is immediately evident that the figure for  $Pr, l$  (number of consumption units/workplaces) enables us to identify with great precision 'how much' a city communicates relative to its workplaces. Consequently it provides us with clear information as to its economic fabric.

Paraphrasing North (1955) in Lloyd, Dicken (1984), it apparently testifies to that 'coefficient of vitality' possessed by a city or a region which expresses its capacity to "transmit the effects of external changes to the local economy" (ibid., p. 251); that is, to metabolize innovation by evidencing the dimension of everything that in post-industrial society constitutes "the real engine of urban dynamics" (Camagni 1992).

The overall premise, therefore, is to assume the level of communication expressed by flows relative to work environments as 'base activity', i.e. not residential (which expresses the amount of communication with the outside), and that this is a function of the level of residential communication.

$$Pr, l = f(Pr, a)$$

The above-mentioned theoretical framework suggests a specific index:

$$Pr, x = Pr, l / Pr, a$$

That is, the relational potential of a centre  $x$  is given by the ratio between the 'mass' of telephone consumption of its workplaces and that of its household consumption (3).

This gives the proportion between the two volumes of communication, and it will be the higher the greater the amount of economic activity ('weighted', it should be reiterated, on the relational level) engaged in by the urban population.

In sum, an indicator of this kind seems valid because:

— it provides an approximate but correct specification of the relational and exogenous features of an urban centre;

— use of this indicator extended to the structure of the urban network allows measurement of its performance in relational terms and its inclusion in wider networks of urban systems;

— when extended within a comparative framework to different urban systems, this type of analysis enables assessment of chrono-spatial similarities and differences.

It is, moreover, to a large extent representative of the level of economic development reached by the various territorial areas.

### URBAN SYSTEM AND RELATIONAL PERFORMANCE: A COMPARISON

As we have seen, identifying the relational potential of a centre enables approximate but correct specification of the relational and exogenous features of an urban centre. I therefore set out to verify its utility for definition of a pattern of the urban system which, superimposed on the traditional hierarchical pattern of the early 1980s (Fig. 1), altered or confirmed its structure.

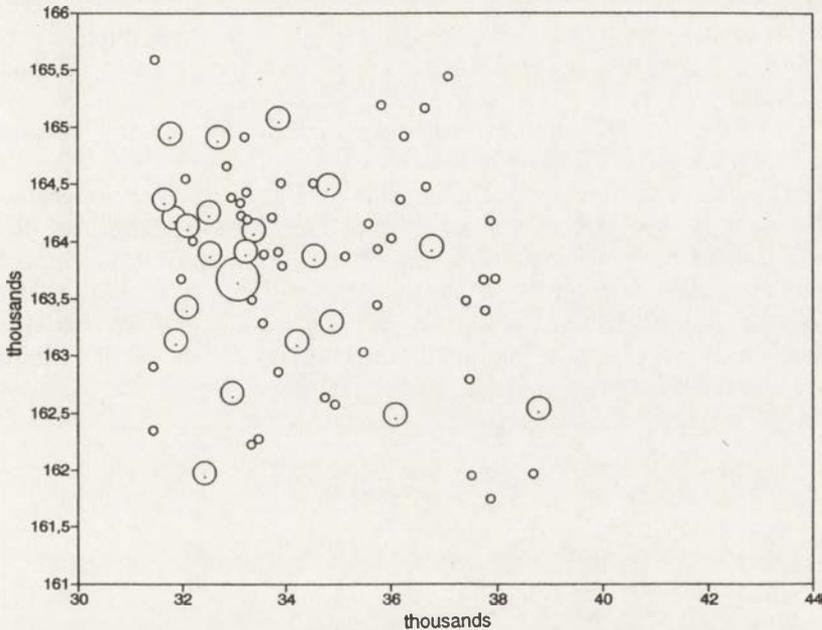


Fig. 1. The urban network of Lombardy according to Bellucci's study

The regions studied — Lombardy and Sicily, which are emblematic of the dualism in Italy's process of development — also represent the two extremes of the regional density of business telephone consumption (1990 SIP index nos.: 114.8 and 83.8).

Relative to these two regions, the urban network considered was confined to centres with entirely urban features: that is, ones defined according to the presence (or absence) of five functions: commercial, banking, administrative, educational, health.

The study referred to was conducted by Bellucci (1983), who, in one of the numerous studies carried out by the Istituto di Scienze Geografiche of the University of Pisa, drew up a dimensional typology of Italian cities ('large', 'medium', 'small') (4) using the same parameters on a national scale

and therefore with analogous conditions of comparability between the two network models.

According to Bellucci's study, the urban network of Lombardy is constituted by one 'large' metropolitan city (Milan), 22 'medium' cities, and 50 'small' cities; Sicily by two 'large' cities (Palermo, Catania), 16 'medium', and 35 'small' ones (5): my interest is naturally focused only on medium — small size cities.

Table 1 sets out the overall amount for business telephone units and household telephone units for the two urban systems considered:

— If we consider the two territorial systems from this perspective (i.e. by assessing the size of the two above-mentioned indicators), the size-based pattern shows a model that indicates a correspondence between rank of the city and amount of flow volume, which confirms a traditional structure; broadly speaking, medium cities occupy top place in the table:

— in Lombardy, the 22 'medium' cities are included in the top 28 positions of the table.

— in Sicily, the 16 medium cities are included in the top 26 positions in the table (6).

The figures in table 2 show the spatial configuration that emerges when the above-mentioned index is used (Fig.2). *The most striking datum is the repositioning of many 'small' cities which, in terms of relative importance, are proportionally distinguished by a greater volume of business telephone units compared with household units and, presumably, by a better competitive position: we define also the changes in christallerian centralities identifying the relational features of centres.*

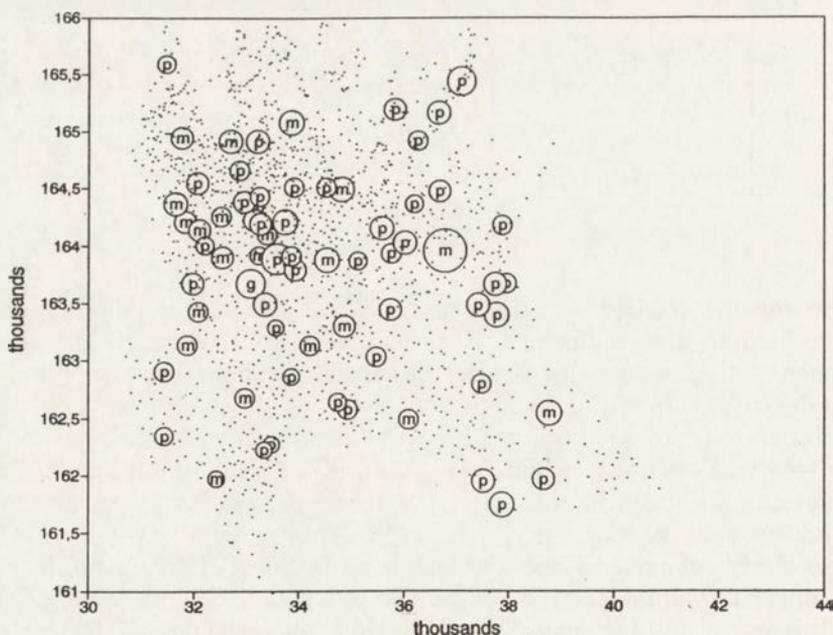


Fig. 2. The spatial configuration of Lombardy that emerges when the index Pr1 is used

Table 1. Lombardy-Sicily: business telephone units, households telephone units

Business units					
MILANO	360259289	Palazzolo sull' O	1210020	Acireale*	1598856
Brescia*	2452880	Montichiari	1173600	Enna*	1596620
Bergamo*	16081524	Carate Brianza	1134376	Termini Imerse	1390005
Monza*	12314358	Casalmaggiore	1103184	Vittoria*	1304820
Como*	11779254	Darfo-Boario T.	995480	Milazzo	1269896
Varese*	10168983	Melegnano	986990	Mazara del V.	1236560
Pavia*	8146068	Luino	985061	Modica*	1200666
Busto Arsizio*	7069865	Rovato	980100	Caltagirone*	1778520
Mantova*	7011530	Mortara	965952	Canicatti	1169734
Cremona*	6309498	Codogno	940129	Lentini*	1119363
Sesto S. Giov.*	6077820	Chiari	914976	Sciacca*	1058015
S. Donato M.	5435726	Salò	895068	Alcamo	1012800
Lecco*	5349648	Lonato	861182	Taormina	960384
Gallarate*	4953390	Casalpusterlengo	766241	Paternò	951776
Rho*	4913244	Gardone val T.	693504	Barcellona*	934472
Cernusco sul N.	4536846	Ponte S. Pietro	634088	Giarre	907472
Vigevano*	4526852	Romano di L.	626478	Castelvetrano	872727
Legnano*	4355970	Orzinuovi	624260	Bagheria	853664
Lodi*	3158784	Morbegno	601524	Comiso	731276
Saronno*	3125500	Stradella	585936	Cefalù	696069
Vimercate	2979872	Breno	579734	Licata	638848
Seregno	2745665	Clusone	577066	Capo d'Orlando	618372
Cantù	2713032	S. Angelo L.	521703	Patti	603246
Crema*	2699970	Iseo	506775	Partinico	543312
Desio	2621754	Soresina	500480	S. Agata di Mil.	491260
Treviglio*	2525436	Asola	479700	Ribera	460664
Lissone	2352009	Tirano	450241	Piazza Armerina	416658
Voghera*	2351736	Broni	432535	Adrano	407025
Sondrio*	2282890	Lovere	416160	Avola	403992
Abbiategrosso*	2029229	Chiavenna	375540	Noto	398934
Desenzano del G.	2022480	Meda	332788	Scicli	384888
Castiglione d. S.	1952709	PALERMO	34860800	San Cataldo	345695
Magenta	1859520	CATANIA	22256388	Pachino	344814
Meda	1718163	Messina*	10867136	Favara	323830
Erba	1668342	Siracusa*	5619042	Nicosia	314600
Melzo	1417332	Agrigento*	3817908	Bronte	277065
Tradate	1371860	Trapani*	3496654	Castellammare d.G.	265060
Viadana	1337190	Ragusa*	3361450	Mussomeli	243111
Suzzara	1289939	Caltanissetta*	3144546	Salemi	231375
Merate	1256770	Marsala*	2262725	Corleone	229599
Gorgonzola	1254396	Gela*	1806626	Niscemi	178980
Parabiago	1251024	Augusta	1628326	Mistretta	115500

Households units					
MILANO	134617650	Suzzara	821547	Vittoria*	2439905
Monza*	9059673	Carate Brianza	801822	Paternò	2240750
Bergamo*	8156436	Mortara	748380	Mazara del V.	2238772
Varese*	6597342	Chari	702864	Bagheria	2177992
Como*	6515742	Codogno	696164	Modica*	2058872
Pavia*	6288972	Salò	688572	Caltagirone*	1886312
Sesto S. Giov.	5876115	Montichiari	680840	Augusta*	1861514
Cremona*	4402612	Casalpusterlengo	678727	Alcamo	1835067
Busto Arsizio*	4383629	Viadana	674566	Milazzo	1809464
Brescia*	4203910	Palazzolo sull'O.	666225	Sciacca*	1771449
Mantova*	3582460	Stradella	624888	Barcellona*	1690984
Vigevano*	3261674	Darfo-Boario T.	586744	Canicatti	1672754
Rho*	3052406	Casalmaggiore	576992	Giarre	1627603
Legnano*	2936414	Romano di L.	567322	Licata	1611764
S. Donato M.	2847594	S. Angelo L.	550485	Castelvetro	1586996
Gallarate*	2824160	Rovato	536247	Lentini*	1582241
Lecco*	2688602	Broni	521483	Enna*	1576564
Saronno*	2506295	Lonato	490090	Avola	1412046
Lodi*	2506116	Morbegno	472347	Partinico	1356862
Voghera*	2403230	Ponte S. Pietro	469942	Termini Imerese	1314331
Seregno	2033781	Tirano	448567	Comiso	1290372
Cantù	1931328	Gardone val T.	445494	Favara	1274417
Desio	1783551	Iseo	428889	Adrano	1271669
Crema*	1689790	Orzinuovi	401754	Ribera	1156132
Lissone	1580439	Clusone	399294	Pachino	1131666
Desenzano	1553320	Soresina	397032	Noto	1119506
Vimercatae	1501723	Chiavenna	369802	Piazza Armerina	1068903
Cernusco sul N.*	1447254	Asola	366026	Scicli	1036692
Abbiategrosso*	1422226	Meda	327932	Niscemi	1015069
Sondrio*	1228514	Lovere	326756	San Cataldo	945815
Treviglio*	1192460	Breno	218770	Cefalù	912307
Magenta	1170780	PALERMO	44693780	Capo d'Orlando	841574
Parabiago	1095087	CATANIA	24545601	Castellammare d.G.	819254
Meda	1064535	Messina*	15546568	Taormina	776115
Gorgonzola	1020888	Siracusa*	7792723	Bronte	775190
Melegnano	1012594	Trapani*	4497970	Patti	756972
Luino	943149	Caltanissetta	3940814	S. Agata di Mil.	732587
Melzo	934106	Marsala*	3896215	Nicosia	588576
Castiglione d. S.	910635	Agregento*	3637948	Salemi	545775
Erba	898964	Ragusa*	3475178	Mussomeli	543609
Merate	886500	Gela*	3390478	Corleone	530209
Tradate	867520	Acireale*	2711154	Mistretta	343619

\*Medium size towns

Table 2 Lombardy-Sicily: urban relation potential  $Pr1/Pra$ 

Brescia*	5.83459	Vigevano*	1.38789	Cefalù	0.76298
Cernusco sul N.	3.1348	Monza*	1.35925	Capo d'Orlando	0.73478
MILANO	2.67617	Codogno	1.35044	Siracusa*	0.72106
Breno	2.64997	Seregno	1.35003	Lentini*	0.70745
Castiglione d. S.	2.14434	Ponte S. Pietro	1.34929	Milazzo	0.70181
Treviglio*	2.11784	Asola	1.31056	Canicatti	0.69929
Lecco*	1.98975	Desenzano del G.	1.30204	Messina*	0.69901
Vimercate	1.9843	Chiari	1.30178	S. Agata di Mil.	0.67058
Viadana	1.9823	Salò	1.29989	Caltagirone*	0.62477
Bergamo*	1.97164	Pavia*	1.29529	Sciacca*	0.59726
Mantova*	1.95718	Mortara	1.29072	Acireale*	0.58973
Casalmaggiore	1.91196	Lovere	1.27361	Modica*	0.58317
S. Donato M.	1.90888	Morbegno	1.27348	Marsala*	0.58075
Sondrio*	1.85825	Soresina	1.26055	Comiso	0.56672
Erba	1.85585	Lodi*	1.26043	Giarre	0.55755
Rovato	1.8277	Saronno*	1.24706	Barcellona*	0.55262
Palazzolo sull 'O.	1.81623	Gorgonzola	1.22873	Mazara del V.	0.55234
Como*	1.80781	Iseo	1.1816	Alcamo	0.55191
Lonato	1.75719	Parabiago	1.1424	Castelvetro	0.54992
Gallarate*	1.75393	Casalpusterlengo	1.12894	Vittoria*	0.53478
Montichiari	1.72375	Romano di L.	1.10427	Nicosia	0.53451
Darfo-Boario T.	1.69662	Luino	1.04444	Gela*	0.53285
Meda	1.614	Sesto S. Giov.	1.03433	Mussomeli	0.44722
Busto Arsizio*	1.61279	Chavenna	1.01552	Corleone	0.43303
Rho*	1.60963	Meda	1.01481	Paternò	0.42476
Crema*	1.59781	Tirano	1.00373	Salemi	0.42394
Magenta	1.58827	Voghera*	0.97857	Partinico	0.40042
Tradate	1.58136	Melegnano	0.97471	Ribera	0.39845
Suzzara	1.57013	S. Angelo L.	0.94772	Licata	0.39637
Gardone Val T.	1.55671	Stradella	0.93767	Bagheria	0.39195
Orzinuovi	1.55384	Broni	0.82943	Piazza Armerina	0.3898
Varese*	1.54138	Taormina	1.23742	Scicli	0.37127
Melzo	1.51731	Termini Imerese	1.05758	San Cataldo	0.3655
Lissone	1.4882	Agrigento*	1.04947	Bronte	0.35742
Legnano*	1.48343	Enna*	1.01272	Noto	0.35635
Desio	1.46996	Ragusa*	0.96727	Mistretta	0.33613
Clusone	1.44522	CATANIA	0.90674	Castellammare d.G.	0.32354
Cremona*	1.43313	Augusta	0.87473	Adrano	0.32007
Abbiategrosso*	1.4268	Caltanissetta*	0.79794	Pachino	0.3047
Merate	1.41768	Patti	0.79692	Avola	0.2861
Carate Brianza	1.41475	PALERMO	0.77999	Favara	0.2541
Cantù	1.40475	Trapani*	0.77738	Niscemi	0.17632

\*Medium size towns

In Lombardy these centres are the strong nodes in the markedly productive and service-based apparatus of the metropolitan belt and hinterland in the grid marking the area of high communications intensity towards the North, in the fan between Lecco, Como and Varese (Lissone, Desio, Seregno, Meda, Tradate), towards the East (Cernusco s. N., Gorgonzola, Melzo, S. Donato), towards the South (Rozzano), and towards the West (Parabiago); as well as centres with an evident polarization of production or tourism activities belonging to wider territorial systems, such as Brescia, Mantova.

In Sicily this 'relational' character evidenced by the indicator is much less evident: it applies only to Taormina, Agrigento (tourism), Termini Imerese, Enna.

The application of threshold values relative to this indicator in order to establish the levels (at least minimum and maximum) to be assumed as relevant for analysis should, of course, be taken as merely indicative: only by means of further analysis will it be possible to give more precise specification of those "critical parameter values" which "shed light on more stable hierarchies" (Bertuglia, Furxhi 1977).

Provisionally, therefore, the division into four classes ( $>1.5$ , between 1 and 1.5, between 0.5 and 1,  $<0.5$ ) of the values obtained highlights:

In the case of Lombardy:

It is important to point out that the overall configuration exhibits values falling within a wide (relative to the indicator and to the urban size under examination) range of variation (up to 5.83 in the case of Brescia), *with most values above 1* (fully 24 cities exceed the maximum threshold level considered). This signifies that *in almost all the cities of Lombardy the volume of business telephone traffic exceeds the volume of traffic relating to household size*; a finding which is highly indicative of the great 'vitality' of this economic-productive system.

It can be broken down into:

— a first class endowed with proportionally very high business centrality (values above 1.5) which comprises, apart from Milan, 10 'medium' cities (Brescia in first position in the overall system, Treviglio, Lecco, Bergamo, Mantova, Como, Sondrio, Gallarate, Busto Arsizio, Rho), and 14 'small' cities (Cernusco s. N., Breno, Castiglione d. S., Vimercate, Viadana, Casalmaggiore, S. Donato M., Erba, Rovato, Palazzolo s. O., Lonato, Montichiari, Darfo-Boario T., Meda, Magenta, Tradate, Suzzara, Gardone v. T., Orzinuovi, Melzo);

— a second class endowed with proportionally high business centrality (values between 1 and 1.5) comprising 10 'medium' cities (Crema, Varese, Legnano, Cremona, Abbiategrasso, Vigevano, Monza, Lodi, Saronno, Sesto G.) and 26 'small' cities (Lissone, Desio, Clusone, Merate, Carate B., Cantù, Codogno, Seregno, Ponte s. P., Asola, Desenzano, Chiari, Salò, Mortara, Lovere, Morbegno, Soresina, Gorgonzola, Iseo, Parabiago, Casalpusterlengo, Romano di L., Luino, Chiavenna, Mede, Tirano);

— a third class with proportionally less high business centrality values (values below 1) comprising 1 medium city (Voghera) and 4 'small' cities (Melegnano, S. Angelo L., Stradella, Broni)).

In the case of Sicily:

It is important to note that the overall configuration exhibits values falling within a narrower range of variation, most of *them less than 1*, indicative of the fact that in almost all Sicilian cities the volume of demographic traffic surpasses the volume of business traffic. The pattern is somewhat similar, as regards medium cities, to that defined by the quantitative dimension, and it is indicative of cities with a poor ability to reproduce themselves adequately at the level of productive vitality.

It can be broken down into:

— a first class with proportionally high business centrality (values from 1 to 1.5) which comprises the two 'medium' cities (Agrigento and Enna) and 2 'small' cities (Taormina and Termini Imerese);

— a second class with proportionally less high business centrality (values between 0.5 and 1), comprising the two 'large' cities (Palermo and Catania), all the other 'medium' cities (Ragusa, Caltanissetta, Trapani, Siracusa, Lentini, Messina, Caltagirone, Sciacca, Acireale, Mosdica, Marsala, Barcellona, Vittoria, Gela), and 11 'small' cities (Augusta, Patti, Cefalù, Milazzo, Canicatti, S. Agata, Comiso, Giarre, Mazara d.V., Alcamo, Castelvetro, Nicosia);

— a third class with proportionally low business centrality values (values below 0.5) comprising the remaining 'small' cities.

However, much it was to be expected, consideration of the two structures analyzed immediately reveals the great difference in the behaviour of the two city systems according to the indicator used: *only a small number of the Lombardy centres (5 in all, including 1 medium city) have values slightly less than one, and only a small number of the Sicilian cities have values slightly above one (4 centres, including 2 'medium' cities)*. This means, in extreme synthesis, that practically all the Lombard cities have a volume of business flows much higher than household size, whereas for almost all the Sicilian cities the amount of flows related to household size is greater than the volume of business flows.

If we examine the results of the application of the above index to the two urban systems considered, we note immediately its utility in furnishing a synthetic pattern of relational capacity (and, also, of modernization) of urban systems, and that it is useful to conduct comparative analysis of different urban systems and to establish similarities and differences.

This is obviously simply a still rough measure of the proportion between the telephone consumption of production activity and the telephone consumption of the resident population. Further refinement is necessary, especially as regards the scale that contextualizes the universe to be examined and the thresholds levels; moreover, it seems necessary to verify its application to other indicators.

According to these preliminary results, the application can apparently be used:

— *at the macro-level*: for synthetic definition of the structure of urban systems at the level of telecommunications;

— *at the micro-level*: if more precise specification is given to the threshold

values, this indicator can be profitably used in analysis of the new polarization of network-based productive activities: applied, for example, to the Milan metropolitan area (or only to centres with more than 1000 business subscribers and more than 5000 inhabitants) it brings out very clearly the extraordinary concentration of economic activities which distinguishes the network nodes in the first belt or hinterland, thereby enabling verification of where and to what extent the deconcentration process has favoured economic activities with respect to demographic size (Dematteis 1985).

## CONCLUSIONS

The importance of telecommunications in influencing new urban dynamics — that is, the new competitive dimensions of the city — has prompted the use of the traditional model of the urban economic base in a version adapted to a 'society of telecommunications' to interpret the functioning of city systems according to competitive logic.

For this purpose, a synthetic indicator of the relational features of urban centres was sought, and it was decided to adopt an indicator which assigned a 'weight' to each city relative to the ratio between its telephone consumption and number of subscribers divided into the two categories of user: business subscribers and household subscribers.

Assuming that the degree of connectedness of a city is a function of its competitive performance, and that telecommunications is the key factor in its new image, the business consumption indicator was assimilated to the base activity indicator used in classic theory, and the household consumption indicator to residential activity.

It was thus possible to define the relational potential of a centre as the proportion between the two different volumes of communications: this, by 'weighing' the relational density of economic activities, provides an approximate but correct definition of the 'exogenous' features of an urban centre.

The empirical results obtained by application of this indicator to the urban systems of two region-types have been, generally speaking, interesting. Verifying the behaviour of the traditional urban hierarchy by means of this parameter has highlighted their centres best endowed with communicative capacity; that is, with the greatest openness towards the outside and, overall, the comparison between two different patterns of development ("because of the well-known principle of correlation which ties the level of economic development very closely with the endowment/use of means of communication": Mainardi 1988).

The most striking result has been the provision of interesting patterns of synthesis (Fig. 1). Suffice is to point out that whereas for most Lombard cities the volume of business traffic amply surpasses the volume of traffic relating to demographic size, for most Sicilian cities exactly the reverse is the case, and the volume of traffic related to demographic size exceeds that of business traffic.

However, this is an instrument which requires further refinement, especially as regards the scale that contextualizes the universe to be examined and the threshold levels.

With further refinement it could be used at both the macro-level (for synthetic definition of the structure of urban systems at the level of telecommunications) and the micro-level (with prior adjustments of scale in order to define new network polarizations).

This appears to be an interpretative tool which, with the above adjustments, can yield a map of the centres most endowed with relational potential and therefore with good competitive performance. As has been adequately shown, Italy registers gaps among the levels of development in this sector, and this type of 'primitive' recognition will, it seems, serve to contextualize the competitive behaviour of centres according to the centrality of advanced telematics.

## NOTES

1. It should be pointed out that the development of the telephone in Italy is largely a recent phenomenon, and can be directly related to the country's substantial process of modernization in the past thirty years. This process has been responsible for the major differences in penetration, and even more so in use, that have marked the diffusion of the telephone service at the regional level (Table 3). The phenomenon is even more significant if one remembers that this is a service usually considered to be indicative of a 'minimum' threshold of development.

Table 3. Telephone service at the regional level

Regions	Subscriber/ /100 inhab.	Communes/ /subscriber	Extraurban traffic (thousands communes)
Piemonte e V. Aosta	45.0	398	802,491
Liguria	52.3	325	299,637
Lombardia	45.0	487	1,977,304
Trentino-Alto Adige	41.3	415	150,740
Friuli. V	44.1	416	223,864
Veneto	39.8	484	850,999
Emilia Romagna	45.3	476	864,365
Toscana	45.0	432	687,446
Marche.e Umbria	39.0	467	400,093
Lazio	46.3	357	873,924
Abruzzi.e Molise	36.3	402	233,156
Calabria	29.0	344	212,015
Sardegna	33.9	346	193,497
Puglia	31.7	340	437,086
Campania.e Basilicata	30.2	392	766,802
Sicilia	33.8	299	522,753
SIP	39.9	411	9,496,172

Source: SIP, Information and statistics on 31 December 1991.

It should be added, however, that the endowment in infrastructures is broadly in line with the major industrialized countries. Comparison with other European countries using the most frequently employed indicator (No. of subscribers per 100 inhabitants) shows Italy (38.7) in an intermediate position after the elite values of Switzerland and the Scandinavian countries (above 50%), after Germany (40.7), Belgium (40.1), Greece (39.4) and preceding only Spain, Portugal, Yugoslavia, Czechoslovakia. From a quantitative point of view, the above-mentioned process can be summarized in the following figures:

— between 1960 and 1990 the distribution network grew from 6 million km to 100 million km; that of interurban linkage from 1.2 to 78 million km.;

— in the same period, the number of subscribers rose from 3 to 23 million, business connections from 900,000 to 4.2 million; and extraurban traffic increased almost 27 times, from 315 million communications to 9.5 billion.

2. Among the most significant implementations of this adjustment (which gives access to advanced telecommunications networks and is the key component in the new competitive dimension required by the global market) are the increased use of optic fiber cables (overall 700,000 km of fiber), the boosted potential of the ITAPAC network, the development of specific infrastructures. In organizational terms this commitment has led to the creation of the Division Business, which has the task of promoting new services (RFD, ITAPAC, CDA, CDN, Videotel, satellite services).

The diffusion of these particularly advanced services which, together with the recent revolution in telecommunications, are the cutting edge of communication services is, however, only in its early stages. In some cases (videoconference, teleports) they are still practically embryonic, while in others they have developed considerably: in 1980 the Data Network Access Points (PARD) numbered 53,770, while by 1991 they had increased to almost 325,000 units, ITAPAC subscribers from 96 (1985) to 22,500 (1991), and fax machines from 4,482 (1981) to more than 190,000 units (1991).

3. An interesting area of enquiry is the extent to which this measure can be related to the flow of exports, in the 'orthodox' version of the model: I owe this observation to Prof. M. Costa, whom I warmly thank for his suggestions.

4. A 'small' city is one with at least 4 of these 5 functions, of which 3 are present to a considerable degree.

A 'medium' city is one with all 5 functions, of which 3 are more important than small ones.

A 'large' city is one which has passed a certain threshold in a hierarchy based on equipment, on its area of territorial influence and on the extent of its dominance over other cities.

On this basis Italy had 15 'large' cities, 168 'medium' cities and 352 'small' cities on 31/12/1980 (Bellucci, cit.).

5. The physiognomy of the two network models can be verified by reference to the following:

	cities	population
LOMBARDY		
large cities — Milan	1	1,464,127
medium cities	22	1,485,722
small cities	50	799,941
SICILY		
large cities	2	
Palermo		731,483
Catania		370,679
medium cities	16	2,249,672
small cities	35	896,262

6. Significant among these are a number of 'small' cities marked by a high volume of flows for both indicators; in Lombardy, S. Donato, Cernusco, Vimercate, Seregno, Cantù, Desio, Lissone, Desenzano; in Sicily, Paternò, Mazara del Vallo, Augusta, Alcamo, Milazzo, Canicatti, Giarre, Castelvetrano.

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## SERVICE LOCATION IN THE URBAN SPACE: AN ALGORITHM FOR OPTIMAL SOLUTION

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**Abstract.** The paper deals with the problem of determining the site and the number of public services provided in it. Given the “double-centrality” which has resulted from the development of the Venice Commune in recent time, an algorithm based on the concept of “potential” has proved useful to shed light upon the above mentioned problem.

**Key words:** service centres location, potential and logistic function, urban development, Venice Commune.

### THE PROBLEM

Is it possible to determine the site and the number of public services provided in it? When the city council of any city, independently of the extension of its territory, comes to supply the population with a new public service centre, the serious problem of its location has to be faced. Among the issues to debate there is the optimum number of centres as well as the most convenient site to be reached by anyone independently of their age or their residence in the centre or on the periphery. Several are the possible solutions the public authority will have to select to find the best one, since some are definitely citizen-oriented while others, on the contrary, turn considerably to the advantage of the authorities themselves.

An extreme solution to the problem would be the institution of as many centres as inhabitants or, at least, of one for each ward. In this case the expenses the users would bear in terms of time necessary to reach the closest service centre would be relevantly reduced or zeroed. Obviously, this solution cannot be realistically feasible, as the institution and upkeep of such an elevated number of centres would involve too high costs for any city council.

The other extreme solution, opposite to the former and to the advantage of the public authorities, could be of only one centre for the whole population, thus cutting down Government expenditure. This second alternative would

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\* The authors would like to thank Tassan Fabio and Checchin Marco for their contribution to the paper.

certainly favour the commune finances by minimizing the costs of that services. In fact, the institution of a single centre would force all inhabitants to apply to that single centre of production that, in so doing, would supply a conspicuous number of users by optimizing the advantages of economies of scale. In this case, however, the population would be put at disadvantage because of the long distances separating it from that only centre. So even this second alternative cannot be the best solution of the problem, especially if we take into account the present state of inefficiency in public transport, which could discourage the population from reaching that only service centre. In fact, if to be effective, it must reach most part of the inhabitants, the choice of its location should be optimized by finding an intermediate solution between the two cases so as to balance transportation problems for the population with the commune expenditure.

A detailed analysis of the relation between the dimension of the centre and its setup and upkeep costs will suggest the most convenient number of centres for the provision of such service. Once the quantity of the centres to build up has been individuated, it will be necessary to define which is their best location in order to favour the population as much as possible. Consequently, the provision centres must be evenly distributed within the territory by favouring the most densely populated areas that are easily accessible by public means of transportation.

What is to be faced here is a typical problem of economic geography: the choice of the best location. In this task analytical tools will come to the researcher's assistance in order to find the best solution after the elaboration of data relative to the territory and its resident population.

The assumption underlying this phase of the research is a given exogen variable determining the "*threshold to usage*", namely the highest number of people that each centre can supply and whose qualities are the creation and exploitation of economies of scale together with low transportation costs for the population benefiting from the service. Then this threshold will assume a specific value for each type of service and will be related to the trend of the economies of scale on the basis of the number of users.

## THE VENICE COMMUNE

### THE URBAN HISTORY OF THE LAST CENTURY

If unlike many of the European cities, Venice has preserved almost intact both its mediaeval structure and the natural environment in which it is set, the lagoon, yet its location has also caused serious problems to its economic development.

Since the Austrian domination the urban setting of the city has undergone several town-planning policies and evidence of this can be found at large in unrealized projects as well as in reclaims of different parts of the city.

For Venice it was difficult to keep pace with the new industrial development, as its particular structure could not easily adjust to the changed use

of the urban space after introducing the revolutionary methods of industrial production, which were unknown to the city. To get over this crisis, at the very beginning of the century a proposal for the definitive solution of these problems was closely examined. It called for the construction of a new port to the mainland where industrial development could be concentrated and the promoters of the project could grant the economic growth of the city without impairing its structure in any way, while Venice would preside over the activities that had been correctly moved out of the urban space. The project took shape when, soon after World War I, time at which Porto Marghera was built up, a series of territories were annexed to the Venice Commune: the whole Bottenighi area, the present Porto Marghera where the port infrastructures were installed (1917), the Mestre Commune (1926) and its surrounding areas (1924–1926). The optimum location for the productive infrastructures on the mainland pointed to Porto Marghera as the best site for industrial plants. Yet this new environment brought about a series of related problems, since the growing number of blue-collar workers made soar the demand of housing. Thus, a new process of urbanization started off within a scheme that considered the Mestre district as a working-class dorm for people employed in the new port-related industries (emblematic is the case of Marghera, erected according to the criteria of the “garden city” during the fascism).

The consequent demographic growth accelerated ulteriorly the urbanization process polarizing around the centre of Mestre. Thus the “Grande Venezia” (Great Venice) came into being, a commune having its industrial and working-class periphery in the urbanistic maze of the mainland.

The formation of the extensive urban area around Venice was completed only after World War II when the general change of living standards (such as housing and transport) drew large part of the Venetian population to the mainland.

This phenomenon has been evolving for forty years and has had a profound influence on the economic structure of the insular Venice. In fact, putting aside the activities related to the administration, the service sector and the distribution network, only the port-related activities can counter efficiently the monocultural economic pressure of the Venetian tourism, the leading industry of the city. Attracted by the modern life-style of Mestre, the population transforms the functions and structure of the mainland that, from pure and simple working-class suburb, takes on the traits of a complete city. As a matter of fact, over the years Mestre has been able to bridge up the large gap with Venice that had put it on a lower level. Logically even the interrelations between the two urban nuclei have been undergoing a substantial transformation especially with the mainland functional independence of the historic centre and a certain complementary of both roles and functions. In this light Mestre cannot be left playing the secondary role of industrial suburb; on the contrary, it could be considered as a second fully-developed city that has acquired both the capability and the infrastructures necessary to provide its inhabitants with a complete range of services.

This comparison sets out a process of specialization characterizing two more and more independent and more diversified societies: Mestre, now

almost as important as the historic centre, and Venice, that represents a wide conurbation extending well beyond its traditional boundaries. However, it must be pointed out how the administrative and functionally interdependent unification of the whole structure is still today an open issue.

### THE PRESENT SUBDIVISION

According to the n. 278 law of 1976 enforcing the institution of decentralization areas for communes of more than 100,000 inhabitants, the Venice Commune was divided into 18 wards between the insular zones and the mainland (Figs 2, 3). At the present moment they are organism of public participation operating basic communal services and home to some delegated functions: they are real intermediaries acting between the Commune and the citizens. They provide mainly cultural, medical and social services but, in the first place, they serve as reference point where the population's complaints and proposals are taken into account.

The ward is a circumscribed area of the city with relatively homogeneous characteristics such as form, transportation network and quality of life, all elements individuating zones with a specific identity, sign of a certain social autonomy. However, it is not always easy to distinguish one ward from the other and set their external limits, since often there are no homogeneous elements among them. This is the case of the outskirts of the Venetian mainland that are fruit of the continuous urban expansion that originates fragmentary settlements devoid of individuality and local life.

From the analysis of the different ward into which the Venice Commune is divided, both the lagoon and the mainland show the presence of rich areas with a high concentration of entrepreneurs, top managers and graduates as well as of surrounding poor districts inhabited mainly by less-educated blue-collar workers. In Mestre the highest zones are the squares, while the wards of San Lorenzo-XXV Aprile and Piave 1866 are above the commune average. This status slides down towards Carpenedo and Favaro Veneto to drop significantly in all other directions. Like Mestre also Venice ranks its social areas in the centre encompassing Rialto, San Luca, Sant'Angelo, Santo Stefano and the Academy, though the social condition is generally above the average throughout the city with the exception of the surviving popular districts of Santa Marta, part of the Giudecca, Cannaregio and Castello. A second ward that can be defined as "high" in the lagoon is the Lido, while the rest of the estuary shows a status similar to that of the Mestre periphery.

Thus, the Commune is characterized by its own social structure where the socio-economic condition regularly decreases outwards from the central area of Venice, Mestre and the Lido. What upsets the continuity of this downfall is the disconnected transportation network (railroads and highways) together with surviving old rural districts located mainly in the hinterland.

On the other hand, taking into account the distribution of various activities such as commerce and handicrafts together with the services typical for a



Fig. 1. Venetia and Venice

big city, it comes out that in Venice they are mainly concentrated on the area between Rialto and San Marco with its barycentre in San Luca from where some of the routes lead to the islands and to the mainland. Such urban structure is symmetrically reproduced in Mestre too, where the highest concentration of services is around the squares and the centre along its main traffic arteries towards the periphery and other external areas. However, what stands out clearly is that the outskirts closest to Mestre have remarkably extended their net of commercial distribution especially thanks to big department stores attracting people well beyond the commune territory. Consequently it is the morphology of the Venice Commune itself, stretching from the lagoon islands to the mainland, that creates such a unique but also precarious subdivision polarizing both the population and its economic activities and that causes Venice to act as a “double-centrality” city with all the problems such a situation implies.

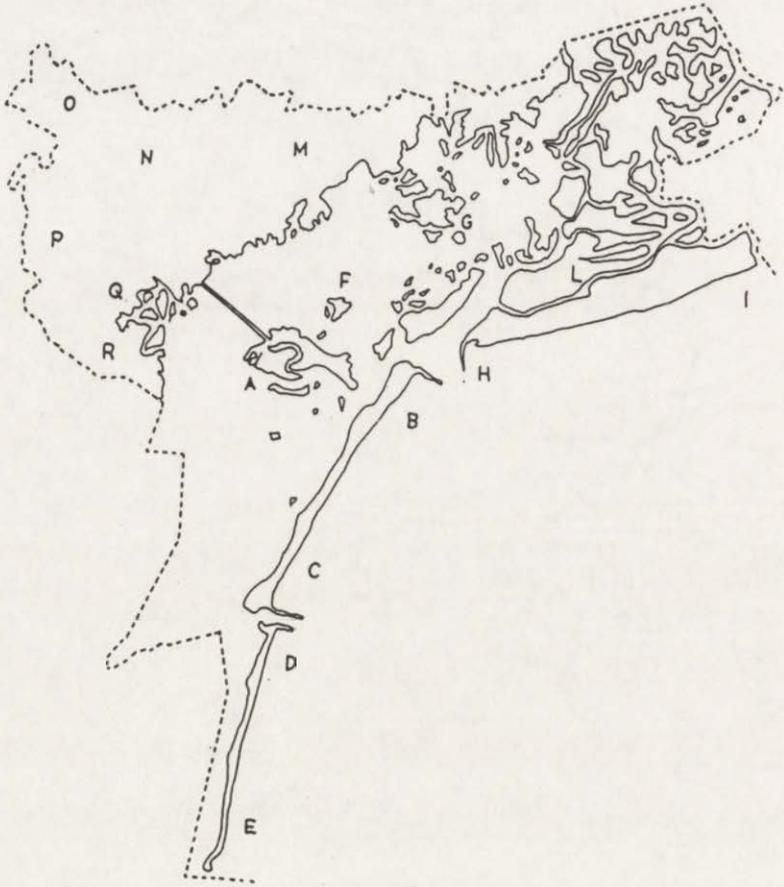


Fig. 2. Configuration of the Venice Commune

A - Venice, B - Lido, C - Malamocco, D - San Pietro in Volta, E - Pellestrina, F - Murano, G - Burano, H - Punta Sabbioni, I - Cavallino, L - Ca'Vio, M - Favaro Veneto, N - Mestre, O - Zelarino, P - Chirignago, Q - Marghera, R - Malcontenta

## AN INTERPRETATIVE PROPOSAL

### COLLECTING DATA

The first step of the research was to transfer on a map of the Venice Commune the 520 sections created on occasion of the 1981 census (when the latest official data were produced). Then, some of these sectors were grouped according to relatively flexible criterion that takes into account both their extension and population, and able to get 134 new urban sections (Fig. 4 for the historic centre and Fig. 5 for the mainland).

The following step was to draw on the map the short and long-distance



Fig. 3. The Venice Commune: the "wards"

Q.1 - San Marco-Castello-Sant'Elena, Q.2 - Cannaregio, Q.3 - Dorsoduro-Santa Croce-San Polo, Q.4 - Giudecca-Sacca Fisola, Q.5 - Lido-Malamocco-Alberoni, Q.6 - Palastrina-San Pietro in Volta, Q.7 - Murano, Q.8 - Burano, Q.9 - Cavallino-Treporti, Q.10 - Favaro Veneto-Campalto, Q.11 - Carpenedo-Bissuola, Q.12 - Terraglio, Q.13 - San Lorenzo XXV Aprile, Q.14 - Cipressina-Zelarino-Trivignano, Q.15 - Piave 1866, Q.16 - Chirignago-Gazzera, Q.17 - Marghera-Catene, Q.18 - Malcontenta

bus routes in Mestre and its surrounding areas as well as the Venice waterways that connect every single zone of the historic centre and the main islands.

To make the data to collect more homogeneous, a more uniform scheduled time was chosen for the different means of transportation, so that it was possible to calculate how long it takes from them to reach every new section. Obviously, for areas particularly close to one another it was preferable to consider the time necessary to cover their distance on foot, which is definitely shorter than by any public means of transportation. For this reason a time unit of two minutes was chosen, which stands for the time necessary to cover 150 metres for the whole range of the population, including children, the elderly and the handicapped, in order to make the analysis more complete and reliable.

The next step was to find the barycentre of the 134 new urban sections and to calculate the temporal distance from one barycentre to the other. The adoption of a time criterion to measure the distance offset the problem that a sample territory as the Venetian one could have caused to our research. Thus, it was unthinkable, though easier, to use geometrical parameters because they would be too much approximate, especially if we take into account

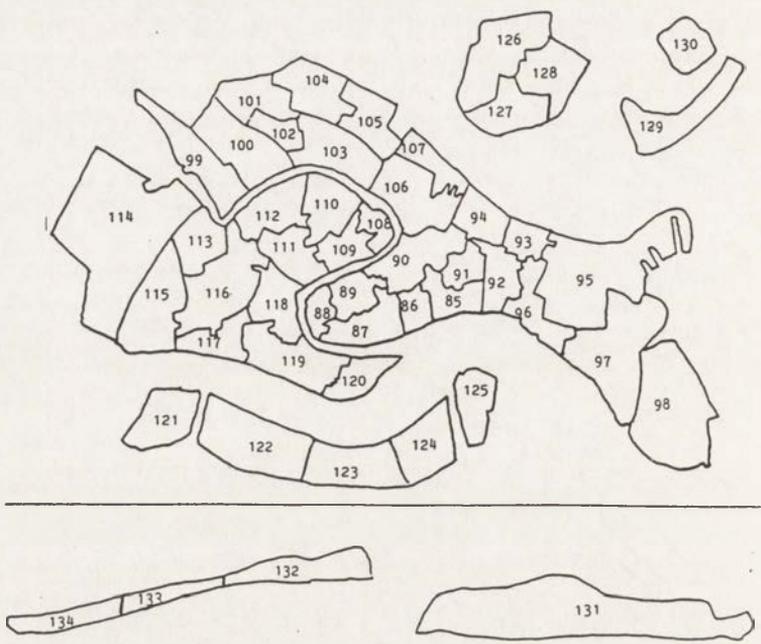


Fig. 4. The new urban sections: the historic centre

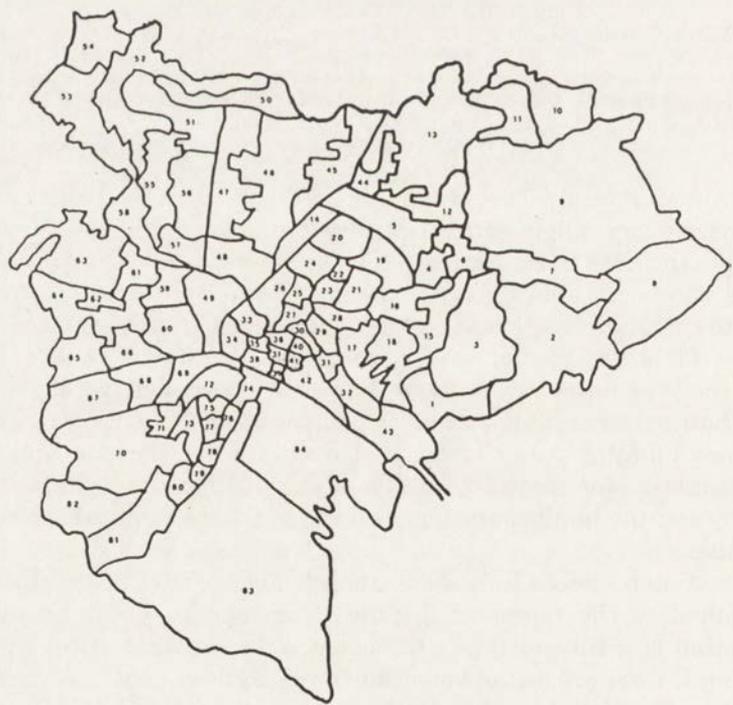


Fig. 5. The new urban sections: the mainland

that in the city, and in the essentially pedestrian Venice too, relatively long peripheral distances can be covered faster than shorter ones. Consequently, all values refer to the time buses and “*vaporetti*” take to run such distances, as they are the only means accessible to everyone, independently of their age, economic and physical conditions.

Eventually, the values were ordered on a distance chart, a  $134 \times 134$  square matrix corresponding to the areas into which the commune has been divided. In this way the collection of data found visual evidence on a distance matrix and on a vector of the population resident in each of the 134 sections.

## THE TOOL OF THE RESEARCH

An algorithm based on the concept of “*potential*” is the tool of research that determined the zones of our sample territory where public services could be conveniently located.

Before describing it in further detail, it is necessary to explain some theoretic assumptions and the procedures as their basis.

By means of a deductive process, axioms drawn on the natural sciences were transposed to the field of the social sciences assuming that the physical laws regulating the distribution and movement of bodies in space can describe by analogy those of men on Earth. So, according to the universal gravitation, if a point in space is loaded with a certain mass, is it possible to individuate another point, loaded with its own mass, with which it sets up a series of relations whose intensity is a function of a distance separating the two points. This number of relations is called “*attraction*”.

Analogically men, considered as unitary masses spread in the geographic space, tend to come closer by attracting one another and group together after the obstacle set by their distance are removed. Obviously, the farther apart they are from one another, the weaker the intensity of their attraction will be.

Economic geography takes from the law of the universal gravitation the concept of potential, namely the quantity of energy that a body has thanks to its position in the space. In the bidimensional space of geography the potential stands for the sum of all attractions exerted on a point of the existing masses. Then the value of the potential calculated in a given area describes the intensity of the connection set up between the population of that area and the whole system. Theoretically it could be referred to as an “absolute potential”, since infinite are the attractions exercised by a body in the space, though such a concept is not to be found in reality. As a consequence, on the basis of the analysis to carry out, in the geographical field the choice falls on potentials calculated in the urban space, in the regional, national or international field.

The calculation of the potential can be made for each single point of the system, thus obtaining a series of different values indicating the best location for a residential area or an economic activity. According to this, the point

of the system with the highest potential will be singled out as the most convenient location for attracting the largest part of population resident in the surrounding territory, notwithstanding the difficulties arising from the distance among the different centres. Another criterion to tackle analytically the geographical problems related to the choice of location is the inductive approach. It is a procedure not allowing the transposition of the law of the universal gravitation to the social field, since it does not recognize it as a unique and general axiom. On the other hand, such an approach lays more emphasis on the frictional effect produced by the space and replaces the distance among the centres with one of its functions according to a mathematical transformation expressing more precisely the intensity of the friction caused by the distance. It is the "logistic function" that better serves this purpose, as it is continuous, positive, not superior to the unit and decreasing parallelly to an increase in distance, with an initial very slow fall to drop abruptly later on. Other features of this function are that it can be annulled only at an infinite distance and that it can better interpret location and economic problems thanks to its simple mathematical properties, its inflection and its way of tending to the asymptotes. Synthetically, it can be expressed as follows:

$$f(d) = 1 - 1/(1 + k \exp(\beta d))$$

where:

$\beta$  and  $k$  — are positive parameters standing for the intensity of the fall of the function toward the asymptote.

They are calculated on the basis of hypotheses about  $d_1$ , flex point where the function is equal to 0.5 and  $d_2$  where it equals 0.25.

In the specific case of this research by calculating the potential of each of the 134 sections into which the Venice Commune had been divided to find the most attractive urban areas, the distance that separates each sections from all the others was transformed through the logistic function as follows: the average distances between two of the 134 barycentres of the section was calculated on a time basis obtaining a value equal to 20, and it was also assumed that in the line of indifference between the two centres could lie on 10. In so doing any phenomenon taking place in a centre after a 10-minute distance would exercise an influence corresponding to 50% of its intensity. Such an influence would be equal to 25% after 15 minutes, and would decrease progressively as the distance increases. In our case the value of the  $\beta$  and  $k$  parameters is calculated assuming that  $d_1$ , where the function is cut down by half, equals 10 and  $d_2$ , where it takes on the value of 0.25, it equals 15, so that the result of the system is  $\beta = 0.21$  and  $k = 9$ .

Now let us to the description of the algorithm itself, which is based on a previous subdivision of the urban territory into different zones and on the calculation of the time it takes to reach each single section only by public means of transportation. It follows that it is particularly useful to find the best location for the service centre to be provided to the resident population.

No hypothesis had been formulated as to the kind of service to supply

or the social class it was addressed to. Consequently, because of its general nature, the algorithm can be applied to a wide range of services, though they may be very different one another. Yet there is a limitation that, in a way, can restrict the choice of the services the algorithm can elaborate, for it had been assumed that each service centre could satisfy only the demand of a well definite number of people, 40,000 at the most. The algorithm starts its process with opening some files containing data relative to the temporal distances among the barycentres of the urban sections and the resident population. Its next step is to order such data on a triangular matrix with null elements along the distance diagonal called  $DM(j, i)$  and on a population vector called  $PV(j)$ . Then it takes into account the frictional effect of the space, that is the friction caused by the distance in the process of attraction of a definite place. The matrix of the distances is so replaced by another one, its function, expressing more correctly the disturbance created by such friction. This is the new matrix of the distance transformed according to the logistic function.

At this stage the algorithm determines the potential of each section where such value represents the sum of all attractions that the population resident in the other areas of the system exercises on a definite place.

The calculation of the potential is repeated as many times as are the urban sections of the system in order to yield a series of values  $P(j)$  that are subsequently ordered in a file.

At this moment, the algorithm starts a long cycle where initially the highest value among the calculated potentials is individuated:  $P(k)$ . This value is then reported on a "result file" setting out the number of the urban section corresponding to that potential. Recognized the most attractive area in the territory, the relative value  $PV(k)$  is found on the vector of the resident population and is so subtracted from a total of 40,000. Now the value corresponding to the highest potential  $P(k)$  is annulled and the same goes for the value of the population resident in the highest-attraction area.

The cycle continues to individuate the urban section that are closest to the highest-potential area and this means looking for values gradually decreasing along the  $k$ -line of the distance matrix  $DM(j, i)$ . Once these zones have been individuated, their corresponding population is calculated and such values are systematically subtracted from that 40,000 total from which  $PV(k)$  had been formerly subtracted. The process is repeated until the zones surrounding the most attractive section represent values of population the sum of which is more than 40,000. This means that the algorithm in the first stage of its process had defined the first place for the convenient location of a service centre as well as the part of the population that will benefit from it.

In another phase, the remaining population is summed up, namely the residents in the urban sections that the algorithm has not taken into account yet, and that cannot benefit from the service because they are too far away from the individuated provision centre. After comparing such a sum with 40,000, the cycle turns back to its initial phase to look for another maximum

among the remaining potentials and in so doing it determines a second service centre. The cycle goes on repeating systematically each single step by detecting the section closer to the new centre and setting out the new part of the population that will benefit from the service.

Such research will continue as long as the fraction of the population not yet considered will reach a total of 40,000. At this point, setting up a new centre will be no longer convenient and the rest of the population will have to go to the trouble of running longer distances in order to benefit from the already established centres. At the end of the process the algorithm will have marked how many and what the best solutions are to optimise the location of the various service centres with respect of the given residents.

## THE RESULTS

The analytical process itself started with reading the distance matrix DM(134.134) and the population vector PV(134) previously inserted in two files called "*data file*" and "*population file*". After verifying with a feedback file that the data had been read correctly, the second phase started off with the transformation of the matrix according to the logistic function.

In the following step the algorithm calculated the potentials taking as control points the barycentres of the 134 urban sections. Once all values of the potentials had been reckoned, that long operative process began and in its first phase individuated section n. 36, namely the area around Piazza Donatori di Sangue in Mestre, as the most attractive zone in the Venice Comune and to which the highest potential equal to 59,899.98 had been associated. This means that section n. 36 would be the best site for whatever service centre thanks to its particular location within the commune territory.

Another element to define was what part of the population would benefit from such a service, taking into account the distance between the users and the service centre. By analyzing the matrix of the distances among the different barycentres the algorithm individuated areas particularly close to section n. 36 and determined the corresponding fractions of resident population. Then it summed the respective values till they reached the threshold of 40,000, namely the minimum of people to which the service was provided in order to realize the necessary economies of scale.

After the location of the first service centre had been determined, the algorithm turned back to the first phase of the operative cycle to look for areas with the highest potential among those that had not taken into account yet. Section n. 25 was individuated as the second most attractive zone in the commune, located in the central part of Viale Garibaldi in Mestre.

On the basis of the elaborated data, right in this area would be convenient to build up a second service centre for the individuated service because of its relative closeness to the heart of Mestre and the main bus routes.

Once the threshold of the population resident in the nearly sections had been determined, the algorithm repeated its process marking another two

zones on the mainland: section n. 69 in Marghera and section n. 19 corresponding to the area around the crossing between Via San Dona and Via Martiri della Liberta near Favaro Veneto. From the analysis so far it comes out how it is more profitable to locate all the first four service centres on the mainland and precisely along an imaginary axis connecting the ward of Marghera-Catene to that of Favaro Veneto-Campalto.

Eventually, by continuing its research the algorithm individuated the highest potential in the historic centre among the remaining ones. The lagoon zones with the highest degree of attraction with respect to a population comprising also the residents of the estuary, were respectively Sant'Elena, Ca' d'Oro and the Zattere to which the urban sections n. 98, 106 and 119 correspond. Everything considered, these areas are fairly well distributed within the lagoon part of the commune and relatively easy to reach on foot or by vaporetto. Then in these three sections three more service centres will be located so as to meet almost completely the needs of the whole population of the commune that, thanks to the present transport network will be able to get one of the seven centres without too much trouble.

At this stage the algorithm completed its research and individuated the seven areas in which the location of future service centres would be more

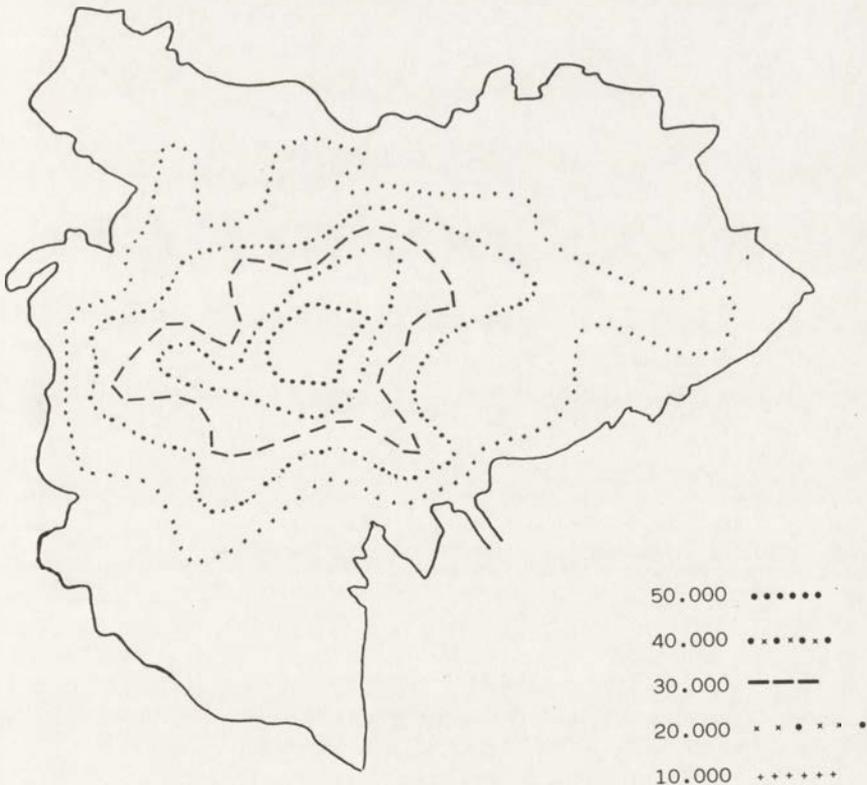


Fig. 6. The potentials of the population: the mainland

convenient, specifying also which and how many users would turn to each centre to benefit from it.

When the analysis was over, some sections had not been associated to any service centre because of their low density and/or distance. The part of population resident in such areas should consequently take the trouble of running longer distances to reach the nearest service centre (Figs 6, 7, 8, 9) referring respectively to the potentials of the population on the mainland, in the historic centre and the location of the urban sections individuated through the application of the algorithm).

### FINAL REFLECTIONS

The Venice Commune was chosen as the urban territory on which such algorithm could be applied because of its particular structure bipolarized between the historic centre of the lagoon and the Mestre mainland. The specific features of the Venetian territorial morphology let for see what the

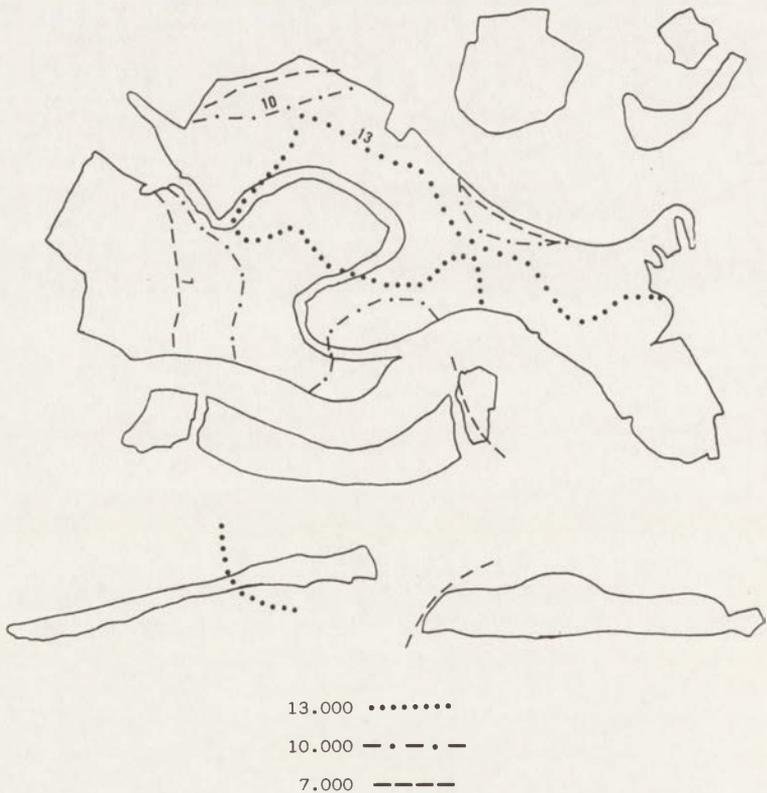


Fig. 7. The potentials of the population: the historic centre



Fig. 8. The application of the algorithm to the mainland

issues of the research could be: a clear distribution of the various service centres between the two main poles of Venice and Mestre.

Nevertheless, these assumptions were proved through the practical application of the algorithm and, in so doing, it was confirmed that the particular subdivision of the commune territory around two big, distinct and scarcely correlated nuclei calls for the clear-cut distribution of some service centres. In this case, Venice and Mestre should be considered as two separated and autonomous cities where the respective population is not willing to run long distances in order to benefit from a public service.

When it comes to consider this issue, however, it is necessary to make clear how difficult it is to schematize the topic of our research although at a first glance its official data seem to prove the contrary. Evidence to it is that there are strong ties between the two zones of the commune, even if the distance separating their centres is about ten kilometres and transit within Venice causes great inconvenience and calls for longer times than in other cities. Notwithstanding this, the resident population is often willing to go through all that trouble in order to benefit from not-easy-to-reach services. The causes of such phenomenon go beyond the scope of this research

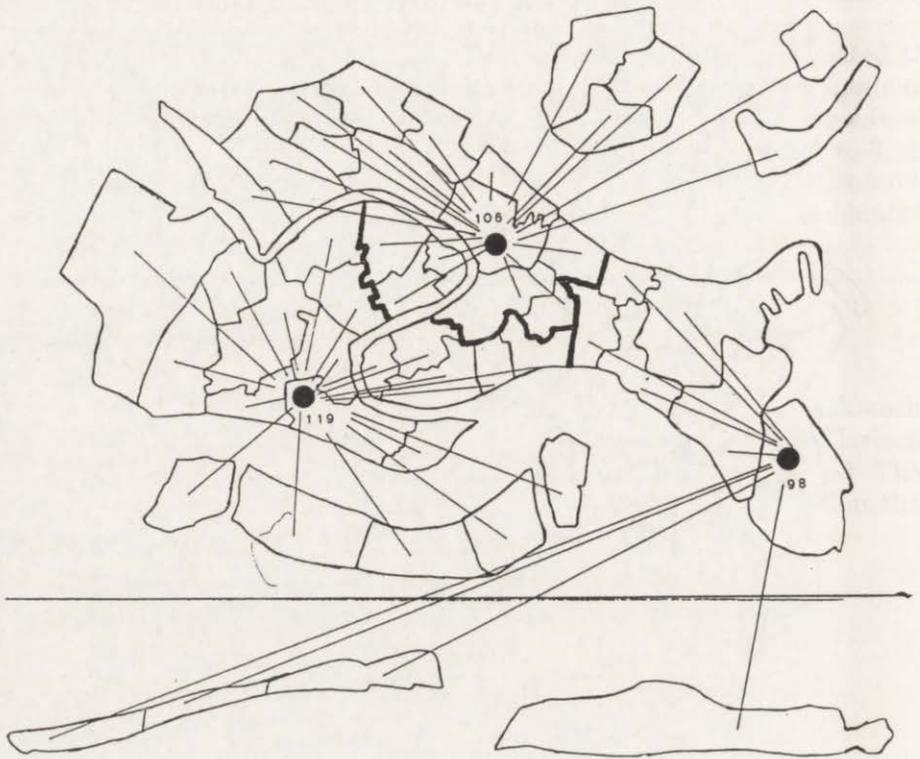


Fig. 9. The application of the algorithm to the historic centre

but can be due to either the affection that the Mestre population feels for the historic centre, since large part of it comes from Venice, or the real need to move within an area that, everything considered, belongs to the same administrative subdivision. Eventually, the lack of data relative to variables like the willingness to run long distances or the revenue of the single sections forced the algorithm not to consider the information that could have sensibly contributed to reach the targeted goal. Consequently, the analytical element alone proves to be inadequate in the present case study. Yet the statistical that had been used provided a close-to-life picture of reality, which is very useful in outlining an idea or in helping define an already known situation in its development. In fact, the algorithm provides a statistical representation, although it misses the dynamic elements indicating the modalities, the times and the reasons for the socio-economic transformation of the territory, all important elements for a correct interpretation of the urban complexity. Therefore, such analysis is to be complemented by a series of reflections on the peculiarity of the sample areas, in order to integrate and back up the final results.

Then, notwithstanding its limits, this analysis is a precious tool of research to confirm, define and quantify the initial hypotheses. Thanks to the data it yields it is possible to define the boundary line between Venice and Mestre and ulteriorly confirm their already evident process of socio-economic differentiation, being aware that mathematical data must be interpreted cautiously.

Not to be forgotten is the integration of Mestre in the Venice conurbation, that can be characterized as an "open system" thanks to the functional and residential specialization it shares with the other centres of the commune and of the surrounding ones, involving also the Provinces of Padua and Treviso.

At this point our analysis leads us to consider larger, more complex and variegated urban realities in the prospect of the future metropolitan scale. Viewed in this perspective, our research involves the whole Venetia urbanization.

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## SOME PRELIMINARY IDEAS ABOUT URBAN DIFFUSION ON A LOCAL SCALE

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**Abstract.** In some areas of the Italian Central-Northern regions there are clusters of small inhabited centres, close together and linked by intense functional relations. These centres show a remarkable demographic and economic vivacity, as well as a completely urban way of life. Among the causes of the formation of these micro-networks is the strong mobility of the inhabitants (private vehicles) and of information. An outline is presented here for a more detailed study of these "extended cities" which are also interesting from a planning point of view.

**Key words:** urban networks, small towns, counter-urbanization.

The phenomenon known as "counter-urbanization", "urban diffusion" or "de-urbanization", depending on the particular models taken into consideration, is also in progress in Italy. Whichever reference pattern or expression is used, in my opinion the following two quotations (Dematteis et al. 1993) well describe the Italian urban network situation of the past few years: "In countries of long-standing industrialization, a regional network structure is currently developing in which the population and its various activities are distributed among a number of smaller centres which together equal the old polarizing centre." "The diffusion over the area of intermediate services for business and of those for families tends both to make the nodes of the network complementary, generating functional interdependence brought about by local specializations (this is true, for example, for areas of widespread industrialization in Central-Northern Italy), and to give the whole network the definition of a complex and unitary region, no longer analysable, that is, as a group of individual centres with their own development trajectories, but as an interdependent territorial whole."

The figures shown in Table 1a refer to two regions of widespread industrialization in Central-Northern Italy: Emilia and Tuscany. As shown in the table, the relation between the sum of the villages' populations and their rate of variation has decreased, going from a positive to a negative figure in the last ten years: it is commonly accepted that such a trend is a sure sign of counter-urbanization. If we then distinguish between the different sizes of towns and villages, using a system of classification devised in Pisa some years ago (Bellucci 1983), we can see (Table 1b) that the development

of the figures is significant: the villages move to a positive figure after two decades of being negative, while the cities and medium-sized towns, after strong positive rates of variation, show a decrease. This happened in the 70s for the two cities (Bologna and Florence), and in the following decade for the medium-sized and small towns. The “tidal wave” of the greatest increases is easily individualized, going from the cities and medium-sized towns in the 50s, to the small towns in the 60s (with the figure for the medium-sized towns still high), to the villages in the 70s.

Table 1.

a	Population		% of variation		r (Pearson)
		1951	50's		0.314
		1961	60's		0.220
		1991	70's		0.061
		1981	80's		-0.057
b	n	% of variation			
		50's	60's	70's	80's
villages	541	-8.70	-2.63	4.69	1.94
small towns	59	3.76	7.70	3.92	-1.12
medium sized towns	26	16.01	13.10	3.21	-2.99
cities	2	21.12	7.35	-4.40	-11.70
total	628	3.66	5.16	2.92	-1.73
sample area	12	5.20	11.12	7.94	2.46
c	Tuscany 1975		n x 1000 inhab.		%
	familes		320		100
	cars		334		104
	TV		252		79
	telephones		245		77

It is not easy to predict how this tendency will develop (some signs seem to indicate that the situation is a stable one): we know that models (for example, the urban life cycle) are more useful for understanding phenomena rather than for predicting their development. What is certain, however, is that the picture of urban settlement over the past 20 years in Italy has changed, especially in the central-northern regions.

In my opinion, a rather interesting aspect of this change is the re-birth (or at least the end of the decline) of medium-sized towns and of villages in various areas of our country, both from an economic and demographic point of view. The aim of this brief report is to lay the way for a study of why and how demographic renewal has come about in these areas. The starting hypothesis is that this happens because in such areas the way of life is now almost completely urban, with some advantages and some disadvantages over the way of life in cities. We are not concerned therefore with studying the extended city, but rather the phenomenon itself. By way of example we will refer to a sample area of Tuscany where, very probably,

the extended city has evolved. This area consists of 12 communes situated between the provinces of Lucca and Pistoia, two of which are medium-sized towns and the others villages.

A further preliminary observation to be made is that the trend we are concerned with could easily be encouraged or discouraged by opportune measures of territorial policy on a local level; therefore a precise study of the existing situation could have interesting applicative implications.

**ORIGIN** — With regard to factors that have favoured the formation of the extended city, we need to refer to the causes of counter-urbanization: it is an extremely vast subject and this is not the appropriate place to deal with it. I feel it is interesting to note the temporal correspondence shown by Table 1c. between the general diffusion of three important facilities and the beginning of counter-urbanization (in Tuscany in the second half of the 70s). As we can see, in 1975 there were 104 cars and about 80 TVs and telephones for every 100 families. These facilities allow for communication and movement, and the idea (which needs enlarging on) is that in this way the extraurban population can still lead an urban lifestyle even though outside the city.

**POPULATION** — The population of an area to be examined should add up to that of a medium-sized town, that is 80–150,000 inhabitants. The sample area has 110,000 inhabitants (each centre having from 3000 to 20,000 inhabitants, approximately), which is more than the nearby provincial capitals. The trend in demographic variations suggests either that the area is undergoing demographic renewal, or that its loss of population has ceased. Our area shows the trend indicated in Table 1b, and is therefore quite lively compared to the rest of the region, although there are notable differences between villages.

**SPATIAL STRUCTURE** — The centres which make up the extended city must be close together so that travel between them can be achieved in similar times to that in urban areas. In our area the average distance between centres is 10 km; the average distance separating the nearest neighbouring village is 3 km, and the second nearest, 4 km. Considering that in an extraurban environment the speed of private vehicles is greater than in the city, these distances can probably be considered even longer. However, distance alone is not enough to further our understanding of the geographical structure, and for this reason other methods of analysis will be useful, among which the theory of graphs. Also to be considered is the fact that the centres are arranged either in the pattern ABC or AB1C, shown in Figure 1. even if the distances between A B and C are the same in both cases, in the second (B1) centre C “filters” the flows of B towards A, so the situation can be decidedly different. Among the various typical arrangements (Fig. 1.1, 1.2, 1.3) that we are able to imagine, the one which most favours considerable exchange is the last, which the structure of the sample area strongly resembles. The classic hierarchical structure does not favour the growth of the extended city, but in time what is shown schematically in the two phases of Figure 2 can come about. This is very probably how the sample area evolved.

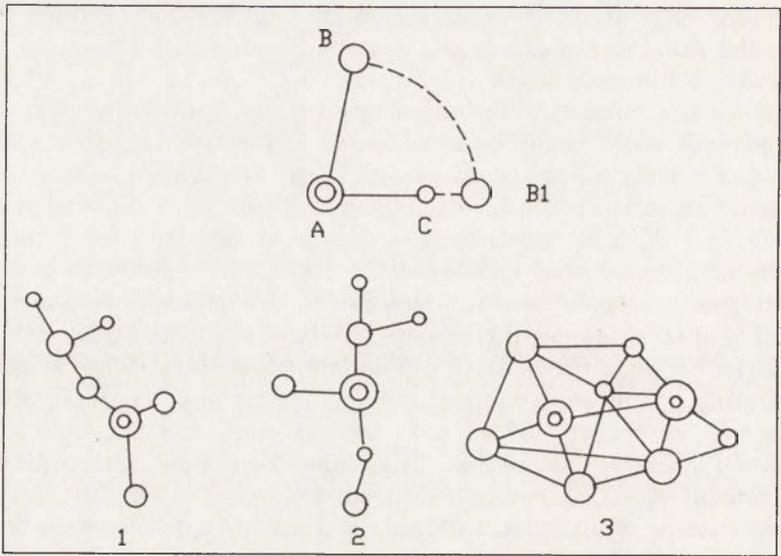


Fig. 1

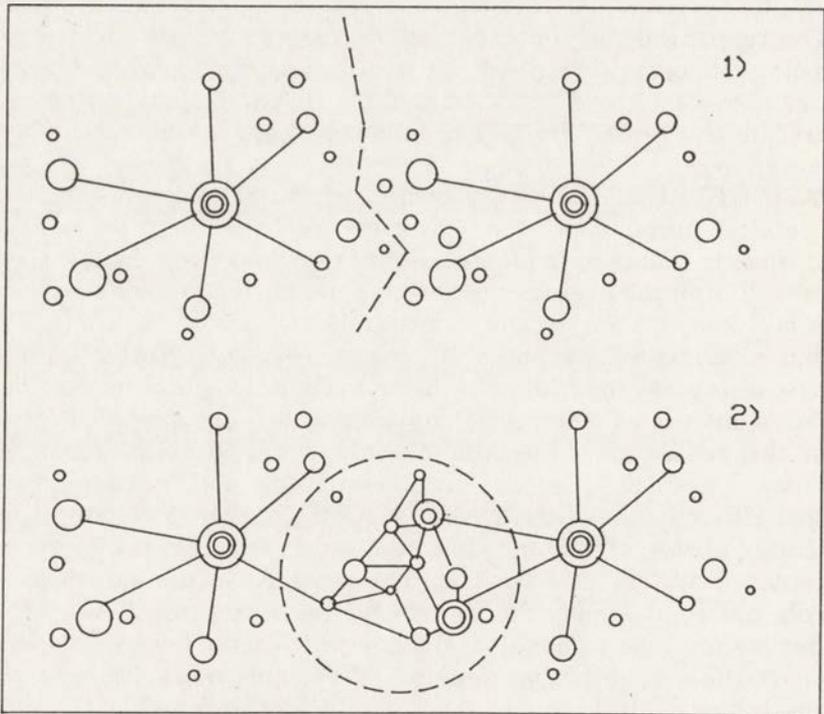


Fig. 2

**WORK AND ECONOMIC RESOURCES** — As far as the economy is concerned, there should be a sufficient ceiling of economic resources and jobs for most of the population. Without these prerequisites, instead of the extended city we would probably have a series of dormitory centres dependent on bigger towns. In the sample area there are a number of 'basic' activities such as flower-growing, tourism linked to the presence of hot springs, paper-making and food industries, as well as the usual series of 'non-basic' activities. A good indication seems to be the fact that, despite the relative nearness of the area's centres to towns outside the area, 73% (min. 38%, max. 88%) of commuters (those who leave their own commune for work purposes) move to commune in the same area. Also related to the commuter phenomenon, Figure 3 shows that the area's most important partners are still situated within the same area.

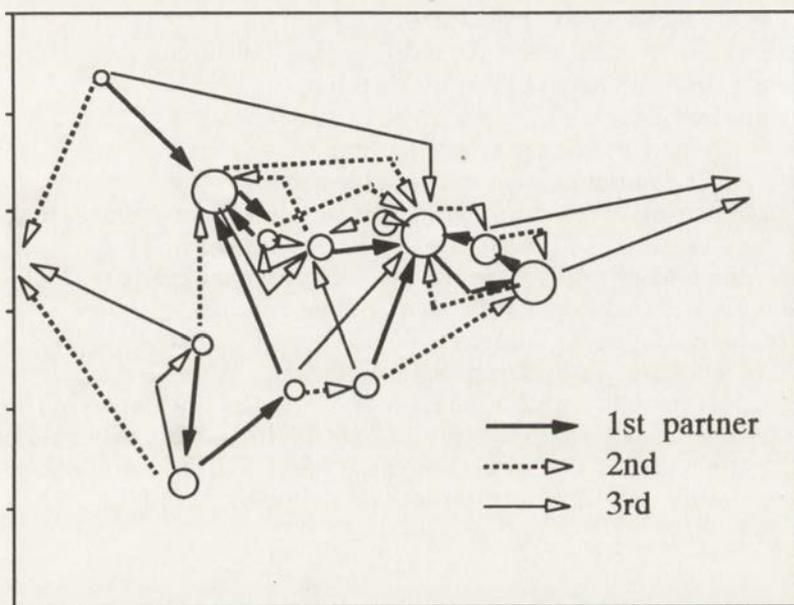


Fig. 3

**URBAN FUNCTIONS** — In these areas there is a complementarity of functions between the various poles rather than a Christallerian hierarchy. If the distances are small and the road network dense then it will be easy to find a functional set comparable to the urban one. In our area, the main functions (health service structures, secondary schools, etc.) are divided between the two medium-sized towns while specialized commercial functions and private services are spread among all the centres. The complete set is no doubt comparable to that of the two nearby provincial capitals.

To conclude, it does not seem worth mentioning in any detail all the other aspects which need to be considered, but some further ideas are suggested by the following "balance-sheet" in which the costs and the benefits

of living in the extended city versus the traditional city are weighed up. Hypothetically, these could be individual and collective costs and benefits.

Individual benefits:

- lower housing and land costs,
- greater percentage of home-owners,
- more space around the home (garden, vegetable garden),
- greater opportunities for an informal second job,
- greater social integration,
- a sense of belonging to the community, “roots”, solidarity,
- less environmental pollution,
- a less stressful way of life.

Collective benefits:

- greater supervision and safeguarding of the territory and its cultural goods,
- possible survival of agriculture,
- utilization of local cultural and economic resources,
- fewer diseconomies of city urbanization.

Individual costs:

- less efficient public transport system,
- a more monotonous way of life (less urban),
- fewer cultural opportunities (theatres, conferences, museums).

Collective costs:

- greater cost of network services (electricity, sewers, gas, etc.),
- lack of scale economies for some public services,
- greater using-up of space,
- more difficulty in building infrastructures.

With this I end my preliminary study. For the moment this consists merely of some ideas, but, given the interest of the subject, it would be very interesting to compare and integrate these ideas with those of others, with reference to different European situations as well.

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## THE ELECTORAL GEOGRAPHY IN THE NATIONAL, REGIONAL AND INTRA-URBAN SCALE

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**Abstract.** Since 1989 the study of electoral voting behaviour become again possible as a descriptive tool of the regional differentiation. The spatial pattern of the political support of particular political option become in high degree regionally stable. This phenomenon has been treated as an element of the formation of a new political structure of Polish society.

**Key words:** electoral geography, voting behaviour, support, political parties.

Electoral geography is a relatively "new" element of regional differentiation of Poland. The electoral results since 1989 provide a reliable source of information and became an additional tool for the description of Polish society in national, regional, local and intra-urban scale. The spatial distributions of the supporters of different political options have become important elements in the general social characteristics of given areas.

The first almost democratic and unfettered parliamentary election since the second World War was arranged for 4 June 1989. It was the result of an agreement, after the Round Table negotiation, between the ruling communist party (PZPR — Polish United Worker's Party) and the democratic opposition represented mostly by Solidarity. This parliamentary election, while not fully democratic because it was to a certain extent predetermined at the Round Table negotiation, was the legal basis for a peaceful transformation, that is to say terminating the communist system in Poland. The direct result was the formation of the first non-communist government in this part of Europe.

A fully democratic power structure was created in result of the next elections: the local government election of 27 May 1990, the presidential election of 25 November (first ballot) and 9 December 1990 (second ballot). However, the most important were parliamentary elections of 27 October 1991, the first fully free election at this level in 60 years.

After the unquestionable victory of Solidarity during the Parliamentary election of 4 June 1989, and in the local government election of 26 May, there was systematic decrease of Solidarity's support during the next following elections. This tendency began at the end of 1990, during the first direct presidential election.

The presidential election of 1990 created basis for electorate expression of critical attitudes to the Solidarity camp on a mass scale. The winner, however, was a representative of Solidarity, Lech Wałęsa, gaining 40 per cent of votes in the first run (at 60.6 per cent participation), and 74.3 per cent of the votes, in the second run (at 53.4 per cent participation). The success of "the man from nowhere" — Stanisław Tymiński, who got 23.1 per cent of votes was a surprise and a shock. Another Solidarity candidate, former prime minister of the first non-communist government, Tadeusz Mazowiecki, got 18.1 per cent of votes and was eliminated from the second run. Unexpectedly, that time, large support was gained by the candidate of the post-communist camp, Włodzimierz Cimoszewicz, who was supported by 9.2 per cent of voters.

At the regional scale, Lech Wałęsa had the biggest support in southern and central parts of the country, in addition to Gdańsk voivodship Wałęsa got the absolute majority in 10 voivodships. These were the same voivodships which gave to Solidarity the highest support during the 1989 parliamentary election.

Stanisław Tymiński got the biggest support from areas North of Warsaw and from most industrialized voivodships of Silesia. Tadeusz Mazowiecki was supported in larger proportions in western voivodships, particularly in Poznań and Szczecin, and in the South only in Cracow. Włodzimierz Cimoszewicz, the communist candidate, was supported mostly in northern and eastern voivodships.

The parliamentary election of 27 October 1991 for the first time posed to the electorate a real choice of different programs. A characteristic feature of this election and the political situation, however, was the fact that particular parties were able only to express in a limited extent the real interests of particular groups. All political parties pretended to represent the interest of the whole nation. As a result of this attitude the political parties were not explicit and did not represent distinct ideas. The lack of a stable political structure representing clearly defined economic interests of particular social groups coincided with the lack of a definite political orientation of the majority of the electorate. In this situation very common electoral behaviour turned out to be abstention.

The basic result of the election was the negation of the pace and negation of the extent of the transformations to a market economy, and also, in part, the direction of such transformations. The worsening economic situation, the high price of the reforms and consolidation of the interest groups against the transformations, together with the loss of patience by the society, resulted in a constant erosion of political support for the Solidarity movement, which in popular opinion has been responsible for the passed years of transformations.

The election finally demonstrated the disappearance of the political division of Polish society between "us" (Solidarity), and "them" (communists). This parliamentary election definitively destroyed the ethos of a Solidarity society. Altogether the supporters of the Democratic Union, Liberal-Democratic Congress and Centrum Alliance attracted only 35 per cent of votes, in absolute numbers less than 4 million inhabitants, or only 14 per cent of the electorate.

The parliament elected on October 1991 very quickly became non representative of the power structure and the preferences of society. The coalitions and political structures in parliament were reconstructed, by creation of new alliances and grouping members of parliament in fractions, or by the creation of new political clubs. This also indicated the low level of identification of parliament members with their electorates. As a result, between December 1991 and June 1993 the prestige of parliament, government and political parties, as measured in public opinion polls, dropped considerably (Gebethner 1993). At that time, most political parties were losing support; only PSL (Polish Peasant Party) maintained support, while SdRP gained substantial increase of support.

### THE PARLIAMENTARY ELECTION OF 1993

Due to the new electoral (proportional) law the chance to enter the parliament is open only to those parties who can cross the 5 per cent barrier of the received votes, 8 per cent for coalition, and 7 per cent barrier for political groups that will participate in the proportional distribution of seats from national lists. This barrier is not applicable to national minorities lists. The electoral law based on proportional system, provided preferential distribution of parliamentary seats to the bigger political parties.

The first place, with 20.41 per cent of votes and 171 of seats (37.17 per cent) went to the Democratic Left Alliance (SLD). The second place went to the Polish Peasant Party (PSL), with 15.5 per cent votes and 132 of seats (28.69 per cent). The leader in former parliamentary election of 1991, the Democratic Union (UD), gained 10.59 per cent of votes and 74 of seats (16.08 per cent). The second left-wing party, the Labour Union (UP), received 7.28 per cent of votes and 41 seats (8.91 per cent). The Confederation for Independent Poland (KPN) and The Non-Party Bloc of Support for Reforms (BBWR) got 5.77 per cent and 4.41 per cent of votes and 22, (4.78 per cent) 16 (3.47 percent) of seats respectively. The upper chamber of parliament, the Senate, was more differentiated in structure; however, of 100 seats, SLD got 37, and PSL 36.

The spectacular success of SLD was a result of doubling the number of its supporters as compared with 1991 parliamentary elections, and on the amplifying effect of new electoral law which reduced the number of parties in the parliament. The Polish Peasant Party (PSL) also doubled its support, and became the second strongest party in parliament. Thus, two parties of post-communist origin received an absolute majority, having together 65.86 per cent seats in the Sejm.

The Democratic Union (UD) in general maintain similar (2 per cent smaller) support as in the 1991 election, but was pushed into opposition in spite of the fact that it received more parliamentary seats. The Labour Union achieved a strong position in the political arena, having the support of more than 1 million voters, and became the fourth largest party in the parliament. The

Confederation for Independent Poland, in spite of losses as compared with 1991, maintained its position in parliament. The new political formation invented and initiated by president Lech Wałęsa — the Non-Party Bloc for Support for Reforms, became the weakest political formation in parliament.

The smallest political parties, receiving less than the minimum 5 per cent support, in sum received 4,727,972 votes. These votes were lost in parliamentary representation, but yet they represented 34.5 per cent of all those participating in the election. The losers were first of all the right wing political parties. The theoretical "right wing alliance", in total, got 19.4 per cent, i.e. nearly equal support to The Democratic Left Alliance (SLD).

In general, the parliamentary election indicated the radical shift of political preferences of Poles to the left. In political terms, the parliament was, however, more left-oriented than society as a whole (Wiatr 1993). The supporters of SLD and UD represent partly the similar social categories. Both parties were generally supported by population with better education and living in larger settlements as compared with supporters of other parties.

The result of this election caused confusion and frustration among transformation supporters. The first interpretation, and the most popular explanation, held that the right was beaten because it was divided while the left was united. The damaging conflict in the post-Solidarity camp (started by the "war at the top") and excessive political involvement of the church were also mentioned.

The results of the election were widely evaluated as not good for Poland and have been compared with the return of communists to political significance in Italy and France in 1950s and 1960s. The results were treated as a protest of the part of society against the lowering of its living standard, political faults of the right and particularly the strong internal divisiveness. Additionally, the results stemmed from a reduced recognition of differences between the communist past and the present democratic conditions.

One of the expected consequences was reinforcement of the old communist nomenclature and a slowing down of the transformation. In international economic comparative perspective, in 1992 and 1993 Poland, finally became the leader of the transformation, the only Central European country with economic growth. The results of the election could reverse that with a damaging effect on the economy. For example, a frequently raised issue that the results of the election would be used by European Union as excuse for the imposition of trade restriction on Poland, slowing down the integration process and diminish the chance of Poland to join NATO. The question was raised whether de-communization tendency would henceforth be replaced by de-solidarization.

During the 1993 parliamentary election, the basic division of electorate was related to social categories, according to various surveys and general observations. The post-communist SLD gained bigger support from all social groups. The biggest increase of support came from workers, medium-level specialists, professional groups, and retired. The Democratic Union, while losing support in all social categories, had the biggest losses among the in-

telligentsia which moved partly its support to left wings parties, primarily to the Labour Union (UP) and Democratic Left Alliance (SLD).

The Polish Peasant Party (PSL) gained increased support from all social groups, absolutely dominating the rural areas and becoming a typical class party representing the interest of peasants. The other peasant party of post-solidarity origin, The Popular Alliance (PL), lost most of its support in favour of PSL.

All other major political parties and coalition from the 1991 election were losers in 1993. Even the Liberal Democratic Congress (KLD) partly lost its support from those working on their own account and from businessmen.

## THE SPATIAL PATTERN

The regional pattern has not changed very much. We can observe substantial continuity, since 1989, of the spatial preference for particular political options. The distribution of participation in elections is, for example, in general the same as participation in all elections since 1989. The better developed voivodships with a tradition of self-government and political activity, were generally characterized by higher participation rate. The only exception are Katowice and Opole voivodships. Central part, North-East and territories along the border were less active in political participation (Figs 1, 2).

The national scale winner, SLD, was also the winner in 26 voivodships (out of 49), located in northern and western part of the country, plus the Warsaw and Łódź agglomerations (Figs 3, 4). The biggest support (over 30 per cent) SLD gained in Włocławek voivodship, and over 25 per cent in north-western part — the areas where during 1991 parliamentary election it was also the winner, however, with the no higher than 20 per cent support.

The Polish Peasant Party was the winner in the most of rural and underdeveloped areas in the central and south-eastern parts of the country. The PSL got more than 25 per cent in all voivodship surrounding Warsaw and in southern part of Poland, generally the areas with the strongest individual farming and traditional agriculture.

The Democratic Union (UD) was the winner in only two voivodships: Cracow and Poznań. It had relatively larger support in southern parts of the country, in Silesia and in Pomeranian together with Warsaw and Łódź; however, in the rest of the country it received below 10 per cent or even 5 per cent of votes (Fig. 4). The Labour Union (UP), competing for the same electorate as SLD and UD, received relatively large support in Warsaw, Łódź and Poznań, and in the industrial region of Legnica and economically declining areas of Wałbrzych. The Confederation for Independent Poland (KPN) marked its presence in the regional structure of Poland in southern and southern-east parts of the country, with the bigger share of support, over 10 per cent of votes, in Cracow and Bielsko-Biała voivodships.

The rest of the political parties usually has lower than 10 per cent of the votes in each voivodship. Only the Electorate Catholic Committee

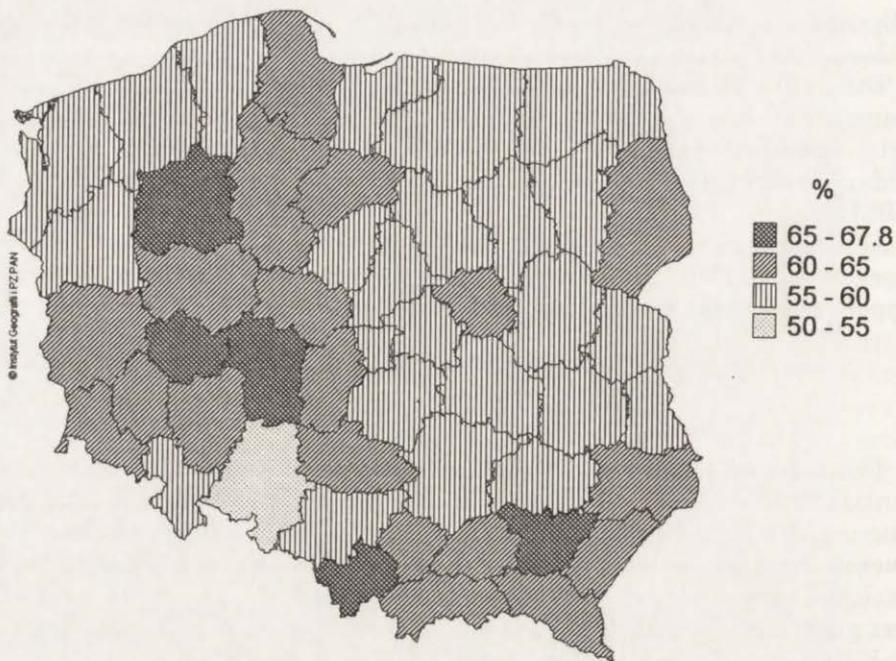


Fig. 1. Electoral attendance in 1990. Presidential election



Fig. 2. Electoral attendance. Parliamentary election of 19 September 1993

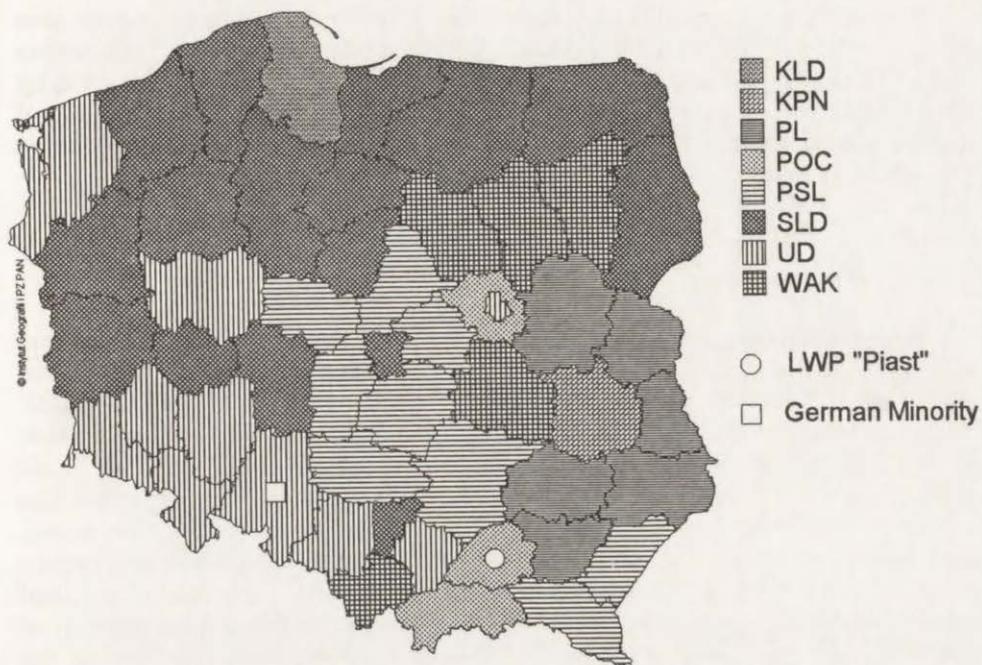


Fig. 3. Parliamentary elections of 27 October 1991. Winners by voivodship

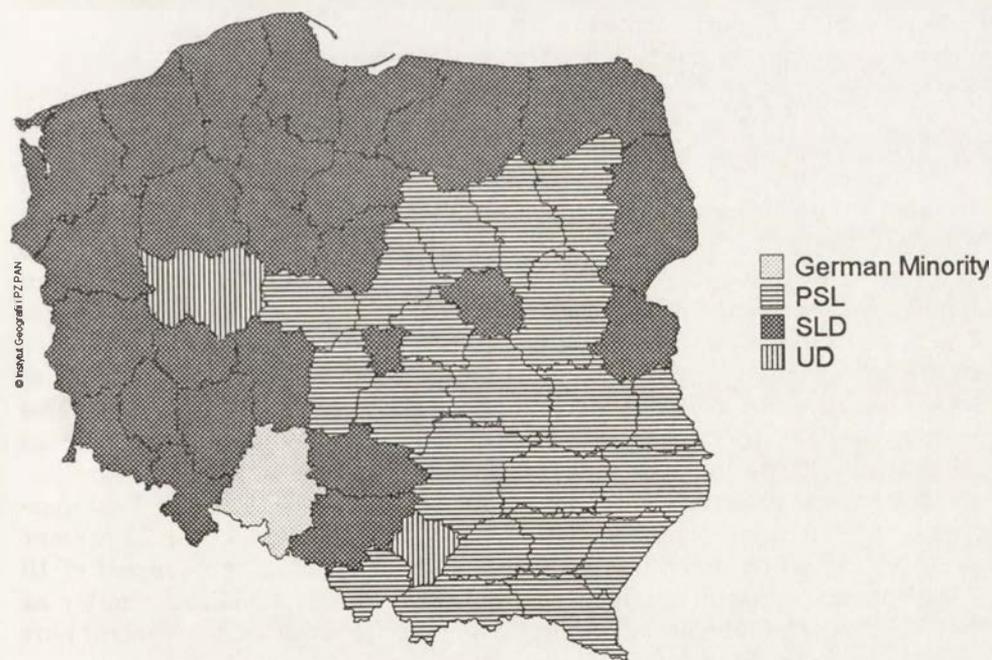


Fig. 4. Parliamentary election of 19 September 1993. Winners by voivodship

“Homeland” (Ojczyzna) obtained more than 10 per cent support in north-east of Warsaw and four Carpathian voivodships. The Liberal-Democratic Congress (KLD) received 10.8 per cent in Gdańsk; the Self-Defence Committee led by Mr. Lepper, received more than 10 per cent of support in his homeland voivodships of Koszalin and Słupsk; in Opole voivodship the German minority got 18.9 per cent.

## THE REGIONAL SCALE

In regional scale, for example, Warsaw voivodship presented evident and characteristic fragmentation of this region. For example between centre and periphery and between particular sectors of agglomeration. The strong political polarization of electoral behaviour observed during parliamentary election of 1991, has been repeated during 1993 parliamentary election. The whole central part has been dominated by SLD. The similar spatial structure was observed during the former election, only the scale of support of SLD increased. The spatial pattern of support for UD remained the same, however, accompanied by decline in scale of support. Also the regional structure of political preferences of other parties remained stable. The political polarization of the Warsaw agglomeration space become a basic element influencing the way of solution of the economic and social problems. This phenomenon is visible while comparing the distribution of the winner of parliamentary election of 1991 and 1993 elections (Figs 5, 6).

## WARSAW — THE INTRA-URBAN SCALE

In intra-urban scale, in case of Warsaw, the 1993 parliamentary election indicated the substantial evolution in the structure of political preferences. Similarly to the 1991, also during 1993 election inhabitants of Warsaw differ in relation to the whole country scale. The size of SLD success has been bigger by 2 per cent and the second political power Democratic Union got 5 percent bigger support in Warsaw than in national scale. The biggest loser in Warsaw was KLD which from second position in 1991 (16.6 percent of votes) has dropped to fourth place in 1993 with only 8 percent of votes. The similar decline experienced PC which managed to attract only 7.8 percent of voters in 1993 compared with 14.3 percent in 1991.

The spatial pattern of the political support between 1991 and 1993 parliamentary elections remained similar. The SLD got support over 25 percent in 1993 (Fig. 7) on areas where during 1991 election has got support of 10 — 20 percent. Also the support of Democratic Union remained similar as in 1991, only the increase of support along North-South axis in central part became more visible (Fig. 8).

The spatial division became evident between areas characterized socially by higher status where the majority voted in favour of Democratic Union



Fig. 5. The winners of parliamentary election 1991



Fig. 6. The winners of parliamentary election 1993

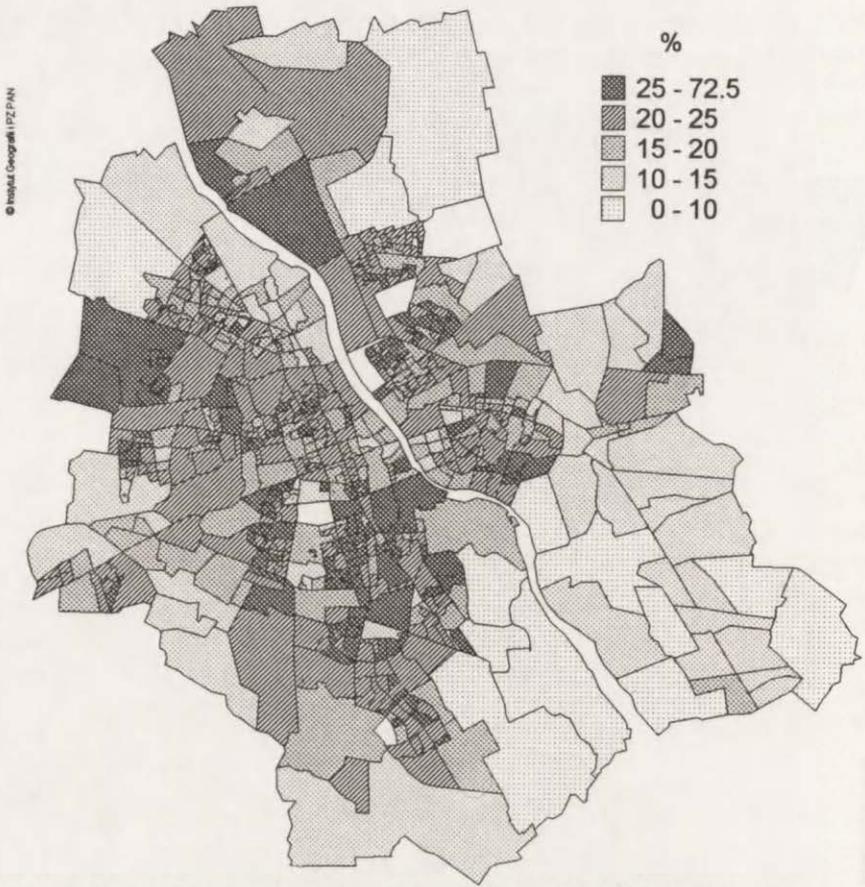


Fig. 7. Democratic Left Alliance. Parliamentary election of 19 September, 1993

or Social Democratic Alliance and labour class areas where highest support gained Union of Labour.

The most radical evolution in the spatial pattern occurred in the case of Liberal Democratic Congress (KLD). During 1991 election Congress received highest support from population of Warsaw periphery while in 1993 the highest support came from central part of the city. The highest loss KLD suffered on the peripheries of individual one family housing areas while in the downtown maintained its level of support. Also the radical decline of support for Centrum Alliance occurred on the peripheral areas of Warsaw.

The spatial distribution of support for the rest of parties rendered not clear spatial pattern, only the Catholic Electoral Committee enjoyed the higher support from several small island-like areas.

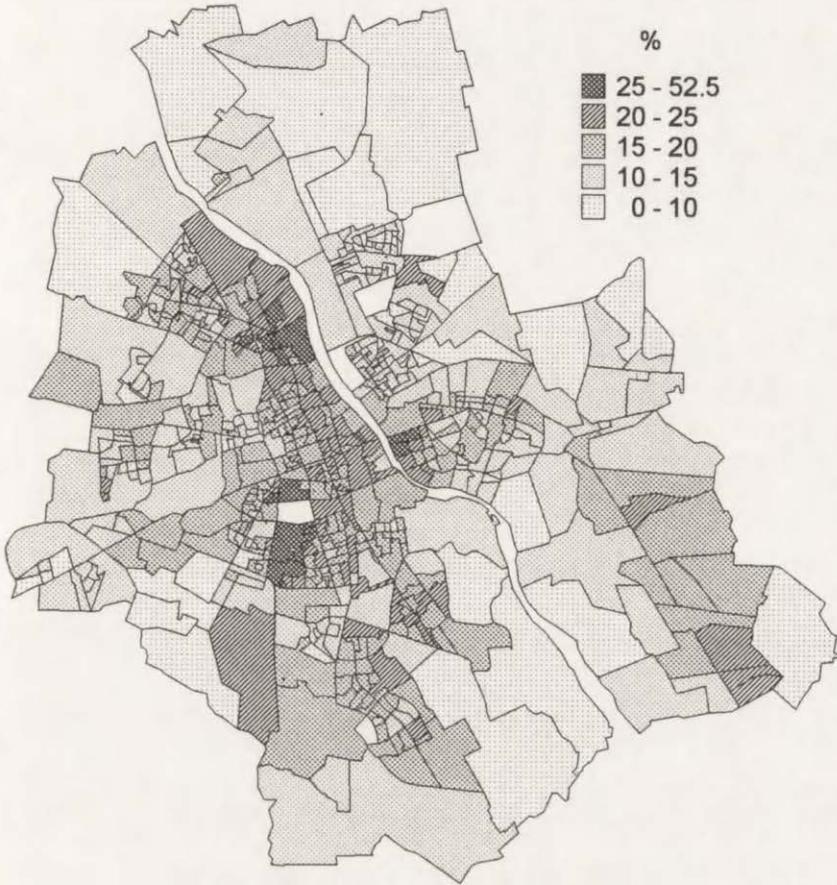


Fig. 8. Democratic Union. Parliamentary election of 19 September 1993

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## URBAN LANDSCAPE AND THE STANDARD OF LIVING

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**Abstract.** The article presents a concept that qualitative differentiation of an urban landscape (particularly housing space in the city) influences the inhabitants and is reflected in their ability to evaluate particular parts of the city. The analytical material collected (using the questionnaire method) comprised 2100 households in Łódź and allowed to verify the assumption stated above.

**Key words:** urban landscape, spatial differentiation, living conditions.

In the common understanding of the word, the term "landscape" is associated with the surroundings shaped by nature and modified by human activity. Landscapes can be divided into 3 main types: primary, natural and cultural (or anthropogenic). The first two reflect natural environment and the last one is a result of human activity, therefore it reflects geographical environment. (Małachowicz 1988).

The term "cultural landscape" can be used when changes introduced by the man are so radical that stable existence of this landscape is possible only due to continuous human activities. The cultural landscape occurs in two main types as:

- harmonious cultural landscape which corresponds with the character of the natural and geographical environment,
- degenerated cultural landscape which occurs when the man, through his new economic activities, brings about permanent, progressive changes, harmful for environment (Bogdanowski 1979).

Cultural landscape reflects human economic activity. Therefore in various forms of this landscape one can find a clear reflection of almost all phenomena which are the outcome of a given stage in the development of civilization, social relationships and economical relations. Also a reverse relation takes place in space: from landscape one can usually read all features characteristic of human activity, mentioned above. In effect cultural landscape constitutes a form of good or bad human economy in a given area, which can be treated as physiognomy of human economic skills.

Urban landscape is a particular kind of cultural landscape. Urban space was created almost entirely by the man. The elements of this space, i.e. buildings, streets, squares, green areas etc., took on different forms throughout centuries, but they always determined the behaviour of people and ordered the process of their everyday life. Most inhabitants of a city pay attention

to its appearance. As a rule, if they have any opinion at all, positive or negative, they do not try to justify it (Szolginia 1981). Nevertheless, one should realise that the look of the city is a social picture through which each inhabitant identifies their city, district, street and house.

Beyond any doubt, for the people living in a city, its most important part, from the emotional point of view, is the part where they live. We can assume that the place and the way people live in the city have influence on the development of their personality and, to a great extent, modify their ability to value space. Therefore the term "housing conditions" has been adopted here. It constitutes in 3 mutually related elements of urban landscape: the flat, the building where the flat is, and the surroundings (the arrangement of urban composition, the occurrence of green areas etc.). The multitude architectural forms and the variety of urban composition make the inhabited areas varied.

One can assume then that qualitative differentiation of the housing space in the city (urban landscape) has influence on the inhabitants and is reflected in their ability to value and grade fragments of the city.

In 1987 in Łódź the author carried out an empirical research concerning various aspects of spatial differentiation of living conditions. The analytical material that was collected, allowed to, among other things, verify the validity of the assumption stated above. The survey (using the questionnaire method) comprised 2100 households from purposefully selected fragments of the housing space of Łódź. The basic spatial element was a statistical urban unit. The choice of the units was made primarily on the basis of the types and forms of residential areas, so that a full variety of these areas occurring in Łódź was obtained. The arrangement of the selected urban units and their division according to the types of buildings are presented in Figure 1.

In each of the units the poll was conducted among 100 families. The quantitative distribution of the poll in the space of each unit depended on the proportion between types of buildings.

The survey consisted of the following parts:

- a) informative: members of the household, their age, education, occupation,
- b) describing the standard of the flat (18 questions),
- c) describing the standard of the building (10 questions),
- d) describing the standard of the neighbourhood (12 questions),
- e) describing the respondents' preferences and dreams.

Apart from the typical data on the structure, size, equipment etc., the respondents were asked about the extent to which their flats met their needs, whether they liked the building and whether they were satisfied with its functions, whether they liked the neighbourhood and considered it peaceful and safe, whether they had friends living nearby and, also, what kind of flat they dreamt about.

The answers were given, obviously subjective, proved that certain parts of the city were perceived in a similar way by their inhabitants, regardless of the age, education or occupation. That made it possible to formulate,

using taxonomic methods, first individual typologies in the range of three standards under study and next a synthetic typology of the living conditions in Łódź for 21 space units.

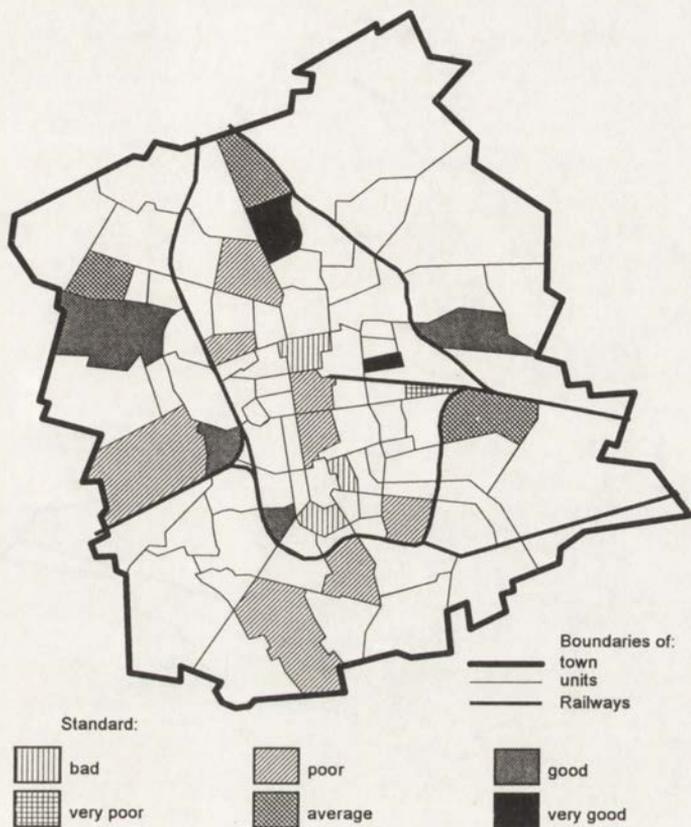


Fig. 1. The synthetic typology of living conditions in Łódź (based on survey 1987)

The synthetic typology lists six types of living conditions in a city (Fig. 2):

- type A: bad condition (in three space units),
- type B: very poor conditions ( in one unit),
- type C: poor conditions (most numerous, eight units),
- type D: average conditions (in three units),
- type E: good conditions (in four units),
- type F: very good conditions (only in two units).

On the aims of the research was to determine what relation exists between people's possessions (as concerns their living conditions) and their ability to evaluate space, urban landscape, as well as their wishes and needs in this sphere. In the authors opinion it is also a very intriguing question to what extent owning a flat and using it in a given part of the urban landscape determines the dreams of the housing conditions.

The psychological definition of dreams has been assumed here (Szewczuk

1979), which describes them as “imagining and thinking activity, the object of which is fulfilling the wishes and intentions concerning one’s own life, either strictly personal or social in the broad meaning of the word”.

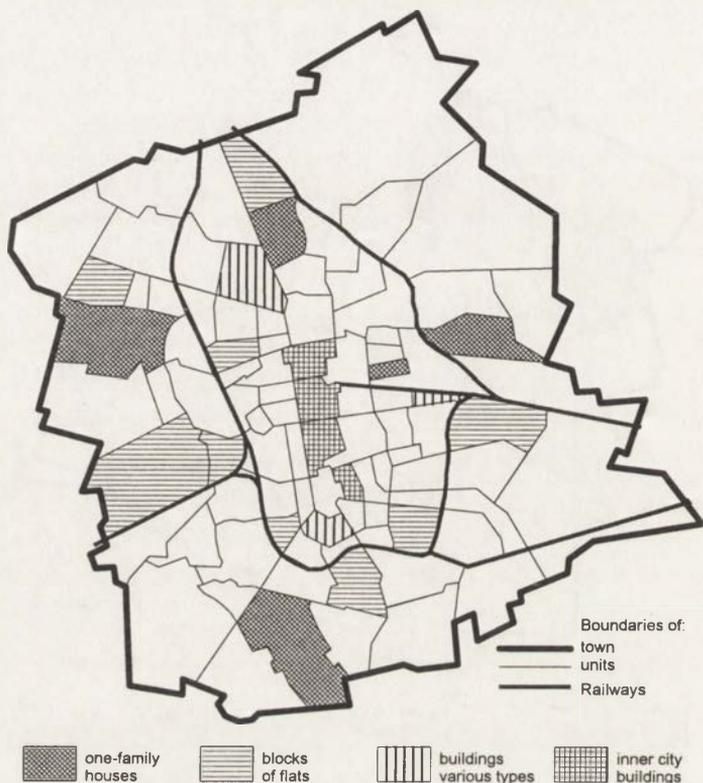


Fig. 2. Łódź a urban units under study according to the types of building

The dreams of the flat and the part of the city where it is supposed to be situated are a in the author’s opinion a a reflection of the personal desires, wishes and expectations, strongly emotionally marked. There are also a reflection of the people’s free will and needs. Defining their dreams, inhabitants subjectively and spontaneously evaluate the urban space, according to their needs and knowledge about the qualitative differentiation of the urban landscape.

During the survey the respondents defined the location of their dream-flat by pointing the chosen, most desired part of Łódź. Only adults were asked, all in all 1810 answers were collected, 1650 of which concerned Łódź and the remaining 160 a the vicinity (the suburbs a 110 people), and other places in Poland (10 people). 21 people did not say where exactly their dream-flat should be.

The analysis of the answers, in which the respondents chose different

parts of Łódź as their dream location, shows certain interesting regularities. In 10 out of 21 urban units under study, 50 and more per cent of the respondents placed their dream-flat where they were living at the moment. Among the other units this tendency is also noticeable. Definitely fewer respondents wished they had their dream-flat situated outside Łódź. Only in 3 units under study such wish exceeded 25% of the dreams.

The two regularities identified above prove that there exist strong emotional links of Łódź inhabitants with their city. In fact, however, this conclusion is not so univocal, because in Polish conditions the change of the city in order to improve the housing conditions is an incidental phenomenon. It is brought about by, first of all, a difficult situation on the flat market, permanent lack of flats and by financial barriers which seriously hinder the change of place where one lives.

Despite the above reservations, placing the dream-flat in Łódź, i.e. where the respondents live, at the moment, means that they accept the landscape of their own city and they are accustomed to it.

Therefore the next stage of the analysis was presenting the respondents' evaluation of different fragments of the urban landscape of Łódź. 1650 of them indicated various fragments of the city, 179 out of this number gave only the name of the desired quarter and the remaining 1471 described the location of their dream-flat precisely enough to ascribe it a defined urban unit (Fig. 3). All in all the respondents pointed to 29 such units. Beyond any doubt, the most attractive among them is Julianów (urban unit N° 107). The wish to have the dream flat there was expressed by 14% of the respondents, coming from 20 urban units under study. By placing their dream flat in Julianów in such great number (206 people), the respondents showed that they preferred one-family houses, erected in a green area, in a zone isolated from noise, still not very distant from the centre. At the same time, in the awareness of Łódź inhabitants Julianów exists as an enclave of villas and wealthy houses inhabited by well-off citizens. Both factors: the character of the urban landscape of this area, partly reflecting the idea of Ebenezer Howard's "garden city" and its social status explain its privileged position among the dreams.

The other locations of the "dream flats" are scattered, that is why, in order to present them better, a map of their concentration in the space of Łódź has been prepared. (Fig.4). The respondents' dreams concerning the location of their flats reflect their knowledge about the city, their habits and personal tendencies to change place of living. They are also a derivative of their abilities to create their own, personal place in space and to compare, evaluate and grade the urban landscape that they perceive. The dreams also constitute an indirect, subjective image of the city where the people in the survey live, they are a reminiscence of the differentiation of the living condition in Łódź.

So, what is Łódź like, as a big city in the opinions of its inhabitants, as far as the housing conditions are concerned? The first and most significant conclusion one can draw is that people are strongly attached emotionally to

the fragment of the urban landscape they live in at a given moment. All respondents perceive it as the space closest to them, although they are still critical while evaluating the place. Attachment to the area where one lives in the Polish conditions a symptom of the emotional links with the place, permanent relations among local communities, personification of the urban landscape, but it also arises from limitations. Although they do not depend directly on people, they relatively severely limit the possibilities to change the place of living (it is connected mostly with the financial barriers).

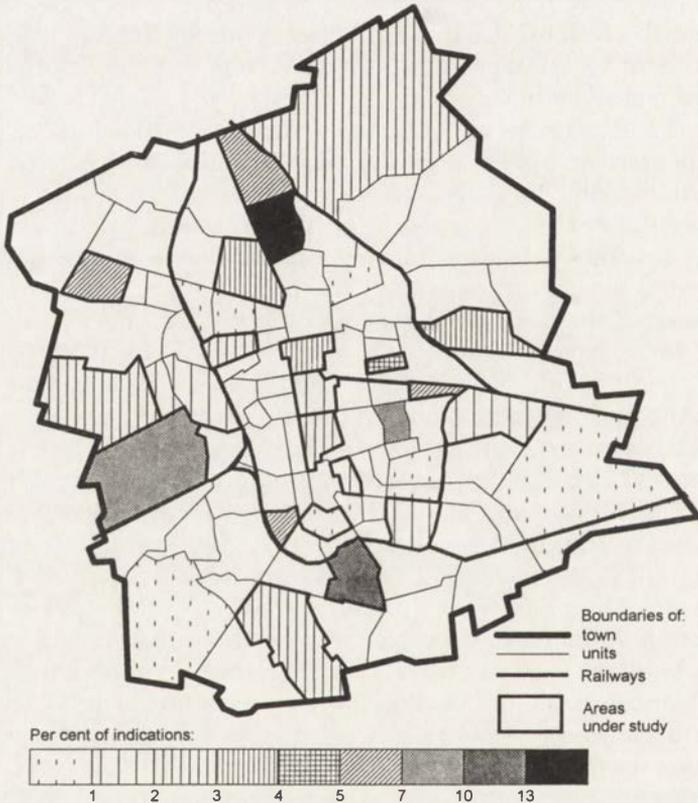


Fig. 3. Spatial units indicated by the respondents as the location of their dreams flats

Practically speaking, in Polish conditions, both in the times of centrally planned economy and nowadays, at the stage of transition to the market economy, there has been no such phenomenon as changing the kind, size and location of the flat along the consecutive stages in the growing of family. Only few can change flats (the financial threshold is fairly high) so that they could be adjusted to the needs. The phenomenon of changing the flat because of its unfavourable location in order to gain a higher social position is almost non-existent.

The direct consequence of the above conditions is the lack of the ability to grade and evaluate particular fragments of the urban landscape. The other interesting phenomenon observed among the inhabitants of Łódź in the survey is the existence of a “myth” of the place synonymous to a high standard living, i.e. Julianów, a fragment of the urban landscape with one-family houses and green areas.

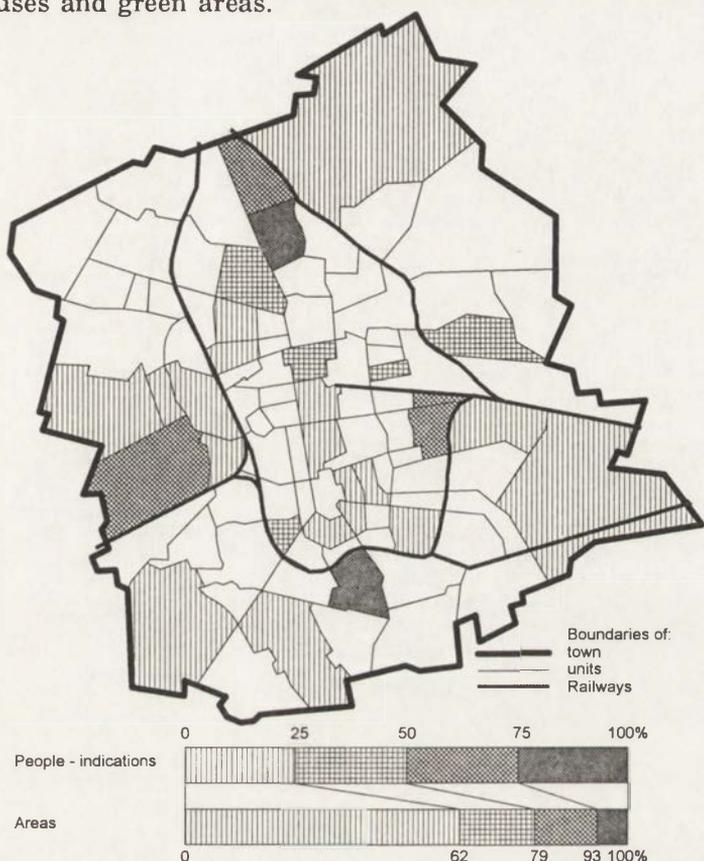


Fig. 4. The map of concentration a locations of the dream flats in the space of Łódź

The above conclusions are well illustrated by the maps of locations indicated by the respondents as most desired. The maps have been prepared for four spatially different, exemplary urban units. In this group there are different fragments of the urban landscape of Łódź:

- Julianów (one-family houses) a urban unit N° 107,
- Old Chojny (buildings various types) a urban unit N° 204,
- Retkinia (multi-family buildings, blocks of flats) a urban unit N° 311
- Centre (inner city buildings) a urban unit N° 406.

The locations of the dreams flats given by the respondents from these areas, in all four cases are characterized by the domination of the present place of living (Figs 5, 6). Other locations are scattered at random, irregularly

and one cannot speak about any regularities in their spatial distribution. The only common feature is the fact that in each urban unit Julianów occurs as the location of the respondents' dream flat.

In the light of the research that has been carried out, the urban landscape of Łódź appears as an area perceived by the respondents fairly indiscriminate-

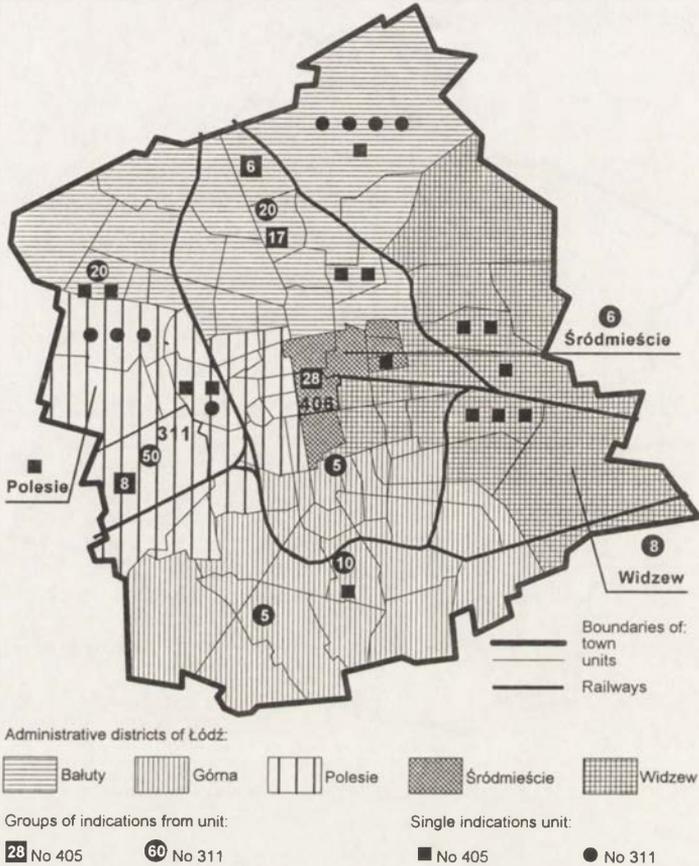


Fig. 5. Map of locations indicated by the respondents from urban units N° 311 and N° 405

ly. In fact, they do not evaluate it, they do not compare its fragments to one another either. This lack of gradation results in selective reception of the urban landscape, definitely individual and subjective, corresponding to, so called "integration cone" according to Gould's research (1966), conducted country-wide.

Only one fragment of the urban landscape of Łódź — Julianów, mentioned earlier is a different area: perceived, identified and evaluated by the people who live in other parts of the city. Other fragments of the urban landscape, different from the place of living, are, as the matter of fact, outside the respondents' interests.

It can also be suggested that the urban landscape of Łódź corresponding to the living space is not too interesting and does not offer too much, therefore

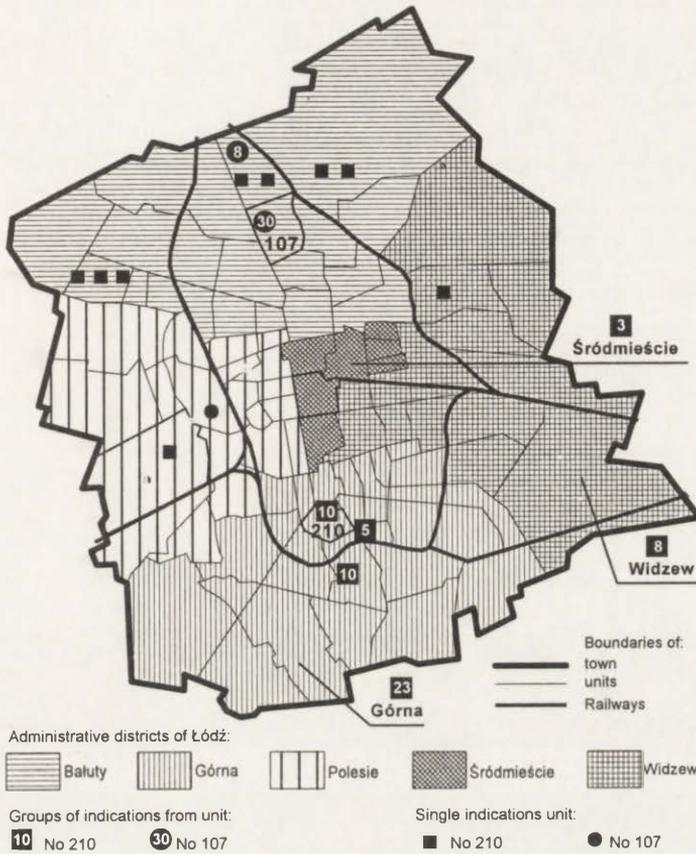


Fig. 6. Map of locations indicated by the respondents from urban units N° 107 and N° 210

it is perceived as a bipolar area: the place presently inhabited a “mythical” place (Julianów). The space between them, in hierarchy of the quality of life in the urban landscape, is empty.

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## TIME GEOGRAPHY STUDY IN INTRA URBAN SCALE. THE CASE OF ŁÓDŹ

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**Abstract.** In this article the concept of daily routine as an aspect of time geography is presented. The empirical studies (3845 persons interviewed) were carried out in Łódź. Based on the analysis of the daily routine of its inhabitants the spatial differentiation of living condition in Łódź was made.

**Key words:** living conditions, daily routine, time geography.

The spatial differences between living conditions in a city depend on the way its space is organized. High standard of the organization of the space makes it multi-functional, enables wide use of its assets and makes it possible for a man to save time. Each inhabitant of the city, in turn, aims at reaching the optimum of their daily routine.

The daily routine is a form of presenting a man in the space-time. It is a part of every man's life route. An individual daily space-time route is the basic form of behaviour in the urban environment (Chapin Jr. 1965). The daily routine is a symptom of highly routinized everyday behaviour, which is the result of free choice and compulsion. Everyday life is particularly determined by the pressure of the urban environment and the individual is rather a product of compulsion than individual, personal intentions (Parkes, Thrift 1980). The daily cycle of a man depends also on the individual's personal characteristics, but practically speaking it has been impossible so far to define the power of the factors of the city's structure on the one hand, and social components on the other hand (Pióro 1977). That is why the daily routine should be used to define the living conditions, with particular consideration for the spatial context. Therefore it has been assumed that daily routine can be one of the measures of spatial differences between living conditions in a city.

The inspiration for undertaking this type of research was the works by Hägerstrand and his associates. The term "time geography" was first used in literature in May 1962 by Torsten Hägerstrand, who elaborated a general method for investigating human behaviour in the form of a system of paths in the space-time (Carlstein 1977).

The subject of Hägerstrand's research is a man who lives in an environment

that is getting more and more complicated. The man in his life is entangled in a net of limitations, which he may be never set free from (Hägerstrand 1970). The approach of the time geography, however, is not based on observing the behaviour of the subject. It is rather the limitations which define and describe their behaviour, that is investigated. Setting the borders within which people fill the time and space becomes the main aim (Thrift 1983). In this context Hägerstrand looks for an answers to the question how to organize the society and shape the settlement structure in order to ensure the man appropriate everyday living conditions (Pred 1976).

A form of describing life in the space-time is a path (trajectory). Assuming a day to be a unit one can speak of a daily routine. On a different scale one deals with the human path of life. The term "trajectory" is the basic notion of the time geography. Another basic term is "project" (Hägerstrand 1973), which is the substantiation of the idea preceding every activity. Series of projects make up plans of activities in the space-time budgets. These plans can be carried out or not, depending on the existing limitations of the environment.

Later in the time the analysis of man's biography in the space-time environment is developed. (Hägerstrand 1978a, 1978b). The man in Hägerstrand's model treats the properties of the environment in which he lives as data, as objective reality to which his everyday routine and path of life must adjust. Individual human decisions in space have little effect on shaping the structure of the environment (Kowalski 1977).

In 1966 in his work on the influence of the ecological structure on making use of time, Tommy Carlstein presented a vast bibliography including definitions of time in different domains (Carlstein 1977). The main idea in Carlstein's publications is the man enclosed within the space-time. The arrangement of human activities during the day can be considered in the context of technological and cultural changes (Carlstein 1977; Oleander, Carlstein 1978). The society and environment are organized in space and time. From this point of view space-time studies should integrate various branches of science. A lot of research into time rejects spatial structures, while studies on space disregard time (Carlstein, Thrift 1978).

A significant success of the Lund school is the construction of a model of availability PESASP (Programme Evaluating the Set of Alternative Sample Paths). PESASP is a deterministic model. It looks for an answer to the question what activities are probable considering the limiting conditions (opening hours of shops, distribution of services, traffic, city transport etc.) and which are not possible in a given environment at a given period of time. The two main elements taken into consideration are the level of individual activity and the environment described in the space-time (Lenntorp 1976, 1977). Lenntorp also uses the term "compact time". The organization of contemporary society demands a compact organization of time. The man functions in a highly organized society where individuality of behaviour disappears. An individual has less and less influence on the schedule of his own daily activity (Lenntorp 1978).

Allan Pred uses in his works the assumptions of the time geography, introducing at the same time the theory of structuralism. Daily activities are the basis for drawing more general conclusions about the society (Pred 1987). At present there are numerous scientist who use in their works some elements of Hägerstrand's space-time concept. The most significant publications, however, which present, evaluate and suggest new solutions, are: "Timing Space and Spacing Time" (Carlstein, Parkes, Thrift 1978) and "Times, Spaces and Places. A Chronogeographic Perspective". (Parkes, Thrift 1980). The forms one does not really look for an answer to the question what time or space are. The authors of the publication try to show the possibilities and limitations in using the terms "time" and "space" in different social disciplines. The choice of authors and problems is impressive. Starting from the search for the meaning of time and space, through a variety of the methodology in geography to space-time econometric models, we finally obtain vast knowledge, which, despite passing years, has not been fully made use of. The latter publication introduces new notions, i.e. chrono-geography, in contrast to the time-geography. The time-geography represented by the Lund school is very physicalistic. It focuses on physical facts (location and movement), neglects individual experience and intentions. Human behaviour is strongly determined by the environment. Hägerstrand's objective model can of course be used in the studies on human behaviour but it should be complemented with the space and time experienced (relative notions) (Parkes, Thrift 1978,1980). Geographers have used concepts of the time geography looking for a common scope of research with sociologist (Gregory, Urry 1987). Time and space are the results of social activity. The state acts as the "manager of everyday life", by, among other things, locating, concentrating and segregating urban functions. Everyday routine is then the basic component of the process of social reproduction. Neither time nor space in themselves cause indirect effects; they are determined by the social structure (Gregory, Urry 1987).

Hägerstrand's ideas have also been used in the search for space-time structures of the city's daily rhythm (Taylor, Parkes 1975). The concept of the time-geography has its supporters and its adversaries. It undoubtedly is a significant theory in the social geography. It presents an individual, his living condition in the contemporary complicated world. However, it lacks the element of forecast, it remains a descriptive theory (Petrov 1986). These also appear other reservations. Are geographers prepared to deal with time? After all so far they have focused on space (Parkes, Thrift 1980; Giddens 1987). It is often stressed that Hägerstrand's idea of behaviour in space is a reactive concept (Cox, Gollidge 1986).

The time geography is also perceived as a valuable dynamic spatial theory (Harvey 1974), as well as an existential picture of a person his or her life. (Eyles 1985). It is often stressed that Hägerstrand's model refers to issues which are intuitively obvious. Even not very through knowledge about a given area allows to foresee (not quantitatively) all the problems touched upon in this model. One can, however, draw the conclusion that this model

is being continuously developed, and it can become an important tool in spatial planning (Kowalski 1977).

In the light of the discussion presented here it seems that there exists a prototype of a time geography, unnoticed so far. It is Joyce's "Ulysses". Its main hero is Leopold Bloom, a man without any distinct psychological or physical traits, similar to Hägerstrand's individual. The action of the novel is a typical everyday routine, encompassing eighteen hours on 16th and 17th June 1904 in Dublin. Leopold Bloom's behaviour, described by Joyce, is determined by numerous limitations of the surrounding world. It is also indirectly affected by the hero's biography. One can say that "Ulysses" includes all the ideas of the time geography, developed 50 years later. It does not change the fact, though, that so far only Torsten Hägerstrand's concept of time geography has enabled geographers to participate creatively in a research leading to the creation of new social theories (Węclawowicz 1988).

In May and June 1987 there was a survey carried out in the area of 21 spatial units in Łódź. In each unit 100 households were examined. The empirical data that was collected concerned 3845 people over the age of ten. A record of their activities outside the house during the week was made.

Sixteen kinds of activities were listed and their place within the city space was defined by giving the name of the street. Their duration also was recorded.

In the first stage of analysing the data, the time the respondents spent outside their houses was divided into two main groups of activities:

A — the time of necessary behaviour, which comprised: working and studying, getting to work or school, calling at offices, taking up additional training, seeing the doctor, using various services and doing the shopping.

B — the time of optional behaviour, which comprised walks, staying at a private plot of land for recreation, sport activities, working in the garden, voluntary social work, going to the cinema, theatre, concerts etc., socializing, going to church.

The next step was to denominate six main forms of activities among the population under study, in view of the length of time they took and of the part of the space defined by the spatial units (urban units) where they were taking place. Here is the division made according to different forms of activity in the city space:

- I. work or study;
- II. the time to get to work or school;
- III. the necessities of everyday life-calling at offices, seeing the doctor, calling at service-shops, taking up additional training;
- IV. free-choice activities (doing things for pleasure, entertainment, going to the cinema, theatre), socializing, voluntary social work, going to church;
- V. outdoor sport activities, walks, work in the garden, staying on private plots of land for recreation, sport;
- VI. shopping.

After being divided into categories listed above all data was analysed in

two research contexts. The first context was the information about the time budget of the population under study, defining its functional behaviour during the week. It was assumed that the time budget was a measure for different types of human functional behaviour.

The other context was the information about to what extent the city space was being used (according to the division into spatial urban units) by the population under study during the week which resulted in an overall picture of spatial behaviour.

Having these two analytical contexts allowed to define both the time and the part of the city space where typical daily routine activities took place.

On the basis of the above assumptions, separate, individual typologies of functional and spatial behaviour were worked out. The results, however, interesting, did not solve the problem signalled at the beginning: is the daily routine a measure of the standard of living conditions in a city? Therefore there appeared a need for a multi-dimensional analysis, i.e. for such an analysis of human behaviour where space and time would be treated inseparably. Such instances of behaviour are referred to as behaviour in time and space.

In order to describe the inhabitants' behaviour in time and space in each of the urban unit under study, a group of the following indicators has been compiled:

- a) the extent to which the immediate surroundings are used,
- b) the homogeneity of the free-choice activities,
- c) the determinant of the free-choice activities.

The extent to which the immediate surroundings are used was defined for each of the previously enumerated six forms of activity which were observed in certain places in the city. Two groups of diagnostic characteristics were compiled. The first group (five characteristics) defined the percentage of people (out of all objects of the study) engaging in a given activity within a radius of not more than one kilometre. The other group (five characteristics) defined the percentage of people engaging in a given activity within a radius of one kilometre, out of those who claimed this form as activity to be a part of their daily routine.

The homogeneity of the free-choice activities showed:

- a) the relation of the average duration of an activity from group IV for the whole population under study to the average duration of this activity from the same group for the individuals actually engaging in it;
- b) the relation, calculated in the same way, for the time spent on the activities from group V.

The determinant of the free-choice activities was calculated as the relation of the total average duration of the activities from groups IV and V for the whole population under study to the average duration of the activities from group VI for the whole population under study.

On the basis of 13 indicators and using Perkal's taxonomic method a ratio  $W$  for each of the 21 urban units in Łódź was calculated. Week-day and week-end (Sunday) activities were being considered separately.

Having obtained the values of ratio W it was possible to estimate the possibility to fulfil the needs of the population under study as far as the different groups of activities were concerned, in the immediate space (up to one kilometre) during the week-day.

The following degrees of possibility to fulfil the needs of the population under study has been specified:

Ratio W value	Degree of fulfilling the needs of the population	Respective number of units
<-1	insufficient	-
-1 : -0.5>	very small	2
-0.5 : 0>	small	9
0 : 0.5>	medium	6
0.5 : 1>	large	3
>1	very large	1

The setting of individual groups of units in the city space is presented in Figure 1, where certain interesting regularities in their arrangement can be observed:

Group I — where there is one unit, is located in the centre of the city;

Group II — three urban units located in the centre of Łódź, almost linearly, along the north-south axis with a slight swerve towards south-west;

Group III — situated concentrically, practically inside a peripheral railway line or next to it on the outside;

Group IV — also situated concentricity but definitely in the suburbs;

Group V — located linearly, along the north-south axis, definitely in the suburbs.

The analysis of the types of population's behaviour in time and space on Sundays brings a little different conclusions. For analysing the information from the respondents a taxonomic method was used which showed only similarities between the units under study as far as different types of behaviour among the inhabitants were concerned. It came from the fact that it is impossible to assess objectively the free-choice activities which are a typical form of holiday activity. It is also difficult to define the parameters of the optimum behaviour in space and time on a holiday, when human activity becomes strongly individualized.

## CONCLUSION

Generally, drawing on the analysed types of behaviour in space and time among the part of the population of Łódź that was subjected to the survey, one can assume a hypothetical division of the city space in the context of the degree of possible fulfilment of people's needs during the week-day.

The areas of large and very large degree of the possibility to fulfil the inhabitants' needs are situated linearly, along the north-south axis, in the

centre of the city, in the historic region so called “Old Łódź”. It is a zone of extremely well developed services, often of the city-wide range. In the immediate neighbourhood of this region there are areas of an average degree of the possibility to fulfil needs, which create the east-west strip arrangement in the city space not crossing the line of the peripheral railway. This zone

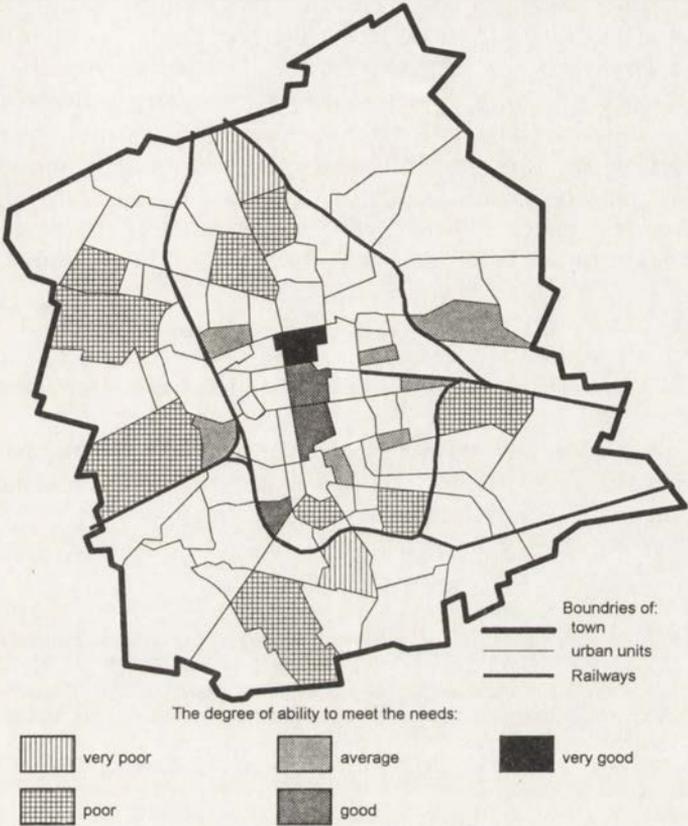


Fig. 1. Space units in Łódź in respect of the degree of fulfilling the needs of their inhabitants

is characterized by a mosaic of types of city space — there appear both housing complexes, spatially integrated, about 30 years old and typical 19th century quarters of average standard. There are also bigger green areas in this zone — city parks.

Outside the line demarcated by the peripheral railway and inside it in the north Łódź there are areas which are characterized by small and very small possibilities to fulfil people’s needs as far as their everyday activities are concerned. The arrangement of these areas is concentric, they are suburban areas lacking services, infrastructurally neglected.

It can also be observed that the possibility to fulfil the needs of the population under study in different parts of the city depends on the availability of means of transport to the centre of Łódź.

From the view point of methodology, examining the spatial variety of living conditions in a city in the context of the inhabitants' daily routine is interesting and provides man valuable conclusions. In a qualitative analysis, however, different types of behaviour in space and time during the week-day should be considered first of all.

Also ways of recording people's daily routine require further examination and a more detailed analysis of the collected data. There is always the danger that empirical research will be too detailed and at the same time the collected information will not allow to draw any general conclusions. One can also be afraid about the comparability (measurable quality) of the analyses and about the possibility to generalize about individual daily routines. On the other hand excessive aggregation and applying statistical and mathematical methods lead to dehumanization of the research, where the subject is a human being who perceives, uses and evaluates space very individually.

It seems that every time this type of research is carried out, one should employ methods which do not ignore the individual person but at the same time give the research on the types of behaviour in space and time a general quality.

Spatial differences among living conditions in a city should be considered on a broad basis and studies of the inhabitants' daily routine can be a significant element of such analyses.

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## SOCIO-SPATIAL ANALYSIS OF CRIME AND DELINQUENCY. A CASE STUDY OF TORUŃ

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**Abstract.** The work explores relations between delinquency, space and local community within the city. Four hypotheses are tested with the aim of explaining spatial differentiation of crime and delinquency.

**Key words:** crime and delinquency, urban pathology, deviant subculture, perception of crime, factorial ecology, correlation analysis.

### INTRODUCTION

The work refers to numerous literature on crime and delinquency which confirms the relations between urbanization, the growth of cities and the increase of crime and delinquency rates.

The study is based on two assumptions. Firstly, the phenomenon under study is considered as one of the forms of behaviour referred to as deviant behaviour, social disorganization or social pathology. These notions apply to negative phenomena and behaviours that are not socially accepted. The basic premises enabling the separation of phenomena that are socially pathological are the following:

- a) their harmfulness and discordance with the existing social systems;
- b) inconsistency with the basic social norms and values that are commonly accepted.

If the above-mentioned standpoint is adopted it is possible to go beyond the traditional ecological and sociological analysis and to look into the problem of crime and delinquency from the point of view of social structures and conflicts.

Secondly, this analysis brings together two basic research trends distinguished in contemporary geography of crime (Bartnicki 1988). The first tendency, applied to as objective geography of crime, explores relations between delinquency, space and local communities on the basis of the analysis of objective and published data. The second one, which aims at the analysis of social perception of the phenomenon, is referred to as subjective geography of crime.

## FORMULATIONS AND RESEARCH HYPOTHESES

Majority of geographical research on delinquency take their roots from ecological approach which attempts to discover relations between ecology, social and housing differentiation of particular city areas (Herbert 1979). The following research, apart from the concept of social ecology, takes as its basis for the hypothesis formulation two other approaches: the theory of social disorganization and the concept of deviant subculture.

The ecological approach aims at answering three basic questions (Węclawowicz 1988):

- a) what is the delinquency phenomenon arrangement in urban areas?
- b) what is their relation to other socio-economic phenomena in the city? in other words, what is their interdependence on the urban area differentiation perceived in socio-economic categories;
- c) why particular spatial configurations of the researched phenomena have been formed?

Hypothesis (1) is based on the ecological approach and the assumption that spatial differentiation of delinquency results from the city development. In consequence, the segregation of unfavourable phenomena in certain places of urban space takes place. In a detailed version, the hypothesis shows that the spatial differentiation of delinquency is conditioned by spatial concentration of families with low incomes, unskilled workers, the unemployed and finally substandard housing. The testing of the hypothesis is based on the mapping and description of delinquency patterns (areal analysis) and on factorial ecology.

The basis of social disorganization concept is the assumption of certain "normality" of collective life peculiar for a local community. If this condition is fulfilled deviants are called to order by efficient institutions for social control. The reasons of deviations are, in this case, interpreted by two different formulations of the phenomenon. The first one is connected with the notion of urban pathology. Life in big cities is characterized by high level of social and spatial mobility, the decline of family ties and anonymity of social contacts. In consequence, institutions for social control lose their influence and negative phenomena accumulate. Hypothesis (2) is based on the assumption that spatial differentiation of delinquency results from urban pathology expressed by the accumulation and co-existence of many unfavourable factors such as the crowding effect, insufficient infrastructure, irrational space organization. It is assumed that spatial differentiation of the researched phenomenon is connected with the intensity and polifunctionality of urban areas, that is zones with high level of mobility, anonymous crowd, reduced social control etc.

The second interpretation is associated with disintegration of traditional culture and social change. Hypothesis (3) presupposes the existence of socio-cultural roots of deviations. They derive from family, marital, sexual and other sources. Moreover, they are regarded as a consequence of the process of disintegration and social change of traditional, local communities.

Theory of sub-cultural deviant assumes the existence of groups and communities within certain societies that base their activities on competitive, normative order. Members of those communities are under the socializing pressure exerted by their environment. Therefore, they learn particular social roles, that are connected with deviant behaviours, through contacts with others. Hypothesis (4) puts forward the assumption that crime results from the process of negative socialization of children and leads to crime approached as profession.

## EMPIRICAL ANALYSIS

The crime and delinquency examination in Toruń is based on crime evidence revealed by the police in 1990. The information concerning the sort of crime, place and time of an incident, offender's place of residence and demographic characteristics was gathered on the grounds of police inquiry and investigation registers. The analysis included the following types of crimes: bulglary, bulglary and house-breaking, robbery, blackmail and muggings. The data comprised 140 spatial units referred to in a census.

### SPATIAL PATTERNS OF DELINQUENCIES

When spatial patterns of delinquencies are examined in an appointed time period it should be remembered that spatial dimensions of that phenomenon are a subject to change. A city — in particular a big and middle-sized one — is a dynamic system which develops spatially, changes functionally, demographically and socially. Therefore, differentiability of spatial patterns of the phenomenon under study in appointed periods of time is strictly connected with it.

Spatial differentiation of the phenomenon researched was analyzed with the use of coefficients comparing a number of crimes with the population density (per 10,000 inhabitants) and with the area (per 1 km<sup>2</sup>). The first coefficient states the relative intensity of delinquency in proportion to the number of population. It reflects the degree of delinquency threat. The highest level of crime and delinquency appears in:

- the Old Town;
- the area between the city centre and the periphery including post-war residential districts with multi-family buildings;
- the periphery in the north-western parts of the city including sub-standard house-dwellings.

The coefficient reflecting the number of crimes per 1 km<sup>2</sup> indicates areas which “concentrate” delinquency in the city under study. The ratio reaches the highest value in the areas where urban space is intensely utilized, densely populated and built up by multi-storey dwelling-houses. These are the following districts:

- the Old Town;
- Rubinkowo, the biggest residential district in Toruń;
- zone of residential district surrounding the centre of the city.

Three types of areas of increased delinquency rate can be distinguished:

- a) main shopping centre;
- b) new residential districts with multi-family house-dwellings erected along traffic arteries;
- c) areas with substandard buildings inhabited by people with lower social and economic status

#### SPATIAL PATTERN OF DELINQUENCIES IN RELATION TO OFFENDER'S PLACE OF RESIDENCE

Coefficients indicating the number of offenders per 10,000 inhabitants and per 1 km<sup>2</sup>. The first one denotes the degree of urban population saturation by offenders. High values of the ratio are notified in the area of the Old Town (with the max. value in the south-west), and the periphery in the northern and western parts of the city. The coefficient indicating the number of offenders per 1 km<sup>2</sup> shows the districts that "generate" delinquency. It is interesting that those areas are mostly inhabited by delinquency suspects. The highest value of the ratio was observed in districts that are densely populated. In addition, close built-up and multi-storey buildings prevail in those areas.

#### PERCEPTION OF CRIME AND SAFETY IN THE CITY

The research on the perception of crime and safety in the city was based on surveys that offered a scale of answer from -2 to +2 for safety assessment. The lack of personal attitude towards the situation in the particular district was marked as "0". The result of the research indicates that inhabitants consider Dębowa Góra as the most dangerous districts. 63% of the questioned regarded the area as very insecure (it was marked -2). The average score given was -1.76. Another part of Toruń thought of as dangerous was the Old Town with the average number of scores -0.96. Equally insecure, according to the survey, were other districts: Wrzosey, Podgórz and Bydgoskie. In the opinion of residents the safest areas were: Kaszczorek (the average score 0.18) and Rubinkowo (0.02).

It should be emphasized that opinions of inhabitants differ considerably according to the distance between their place of residence and a district under study. In other words, the knowledge of a particular area and respondent's personal views and stereotypes play an important role in this kind of a survey. Residents of the Old Town thought the degree of crime and delinquency threat in the city was bigger than in the opinion of the general public. The average score given by those inhabitants for all spatial

units in the city was -0.69 whereas other people questioned gave only -0.52 score. Similarly to the above argument, the residents of the Old Town regarded their district as more dangerous than it was in the opinion of other respondents. According to Rubinkowo and Przedgórze residents, the threat of crime in the city was lower than the overall of the questioned believed. The inhabitants of Podgórz District indicated 9 spatial units that were safer. It could be concluded differently from the survey.

The negative valuation of the degree of safety in the city given by the residents of the Old Town is strictly connected with the growth of delinquency in this district. The feeling of threat has been highly influenced by the increase of robberies in this part of the city. In contrast, the district Pod Dębową Górą Street, which was suggested to be the most dangerous, is in fact the second most insecure part of the city after the Old Town as far as the increase of crime is concerned. Rubinkowo was regarded as a safe district by 44% of the questioned even though the growth of delinquencies is quite considerable in the area.

## HYPOTHESIS TESTING. AN ATTEMPT TO EXPLAIN SPATIAL DIFFERENTIATION OF CRIME AND DELINQUENCY

### THE FACTORIAL ECOLOGY

The analysis included the set of 19 variables concerning the demographic, social and economic structure of people and housing conditions. The transformation of a set of original variables, with the use of principal component analysis, into a set of variables referred to as main variables allowed to distinguish two major dimensions that differentiate city space. Moreover, their original attributes are a subject to a great differentiation.

The major factor of the city space differentiation-in the category of variables under study — is housing conditions of social and demographic groups. It is a fact that such factor most generally reflect the differentiation of the city area according to family, housing social status. The factor is best represented by technical equipment in houses, rate of occupancy, the level of education and the type of dwelling-houses. The determinant comprises distinctly bipolar attributes. Thus, two groups, bearing in mind variables association, can be distinguished. The first group of qualities brings out into relief the co-existence of house buildings and better housing conditions with the greater percentage participation of people with secondary and higher education. The second group reflects the co-existence of household belonging to retired people, detached houses owned by communities with primary and incomplete primary education and people employed in industry. Bipolar structure of the first variable demonstrates, in a general view, the differentiation of the city space and includes the division into districts with old and new buildings, detached and multifamily houses. The scheme is in accordance with the research results obtained by A. Jagielski (1978). He distinguished 4 factor concerning the social space in Toruń:

- a) centrally situated districts with the dominance of old housing;
- b) suburbs inhabited by old pensioners;
- c) old flats populated by families with different family status;
- d) workers and working intelligentsia.

The highest values of variable V1 are noted in Rubinkowo, a new housing estate inhabited by people with higher than average participation of residents with secondary and higher education and household characteristics normal structure. Medium values of the variable are characteristics of the transition zone between the centre and suburbs in the northern part of the city where mainly housing estates accumulate. The lowest values are typical for the Old Town and suburban areas with substandard pre-war housing. The same results were observed in industrious and at the same time housing districts.

The second variable emphasized social and demographic situation. Bipolar structure of this factor is, on the one hand, defined by the association of such attributes as: people with secondary education, women, population aged 65 and over, rate of occupancy. On the other hand, it is specified by people with technical education, employees in industry, people aged 0–14, non-farm maintained population, people with primary education. The factor is of both family — housing and socio-professional dimension. It reflects a tendency towards spatial division of two types of households: those with normal family structure (with children) who are mainly employed in industry and live in a new district. The second group is composed of old dwelling-houses that belong to old pensioners. High values of variable V2 appear in the transition zone surrounding the centre of the city from the western and northern part. Similar values are noted in the centre. Low values, on the other hand, are observed in suburb areas.

The analysis of principal components proves, to a certain extent, hypothesis (1). Spatial differentiation of delinquency is strictly connected with socio-spatial structure of the city as far as the categories of the attributes under study are concerned. Concentrations of offenders tend to appear in the areas that are mainly inhabited by residents with primary or incomplete primary education, employed in industry (at present they are often unemployed). The families are often numerous and occupy overpopulated and sub-standard flats.

## CORRELATION ANALYSIS

Hypotheses testing is based on the analysis of correlation association between delinquency indicators approached as a set of dependent variables and socio-economic characteristics. The last are referred to as a set of independent variables. Correlation coefficients between the pairs of variables present a desegregated picture of dependences in the whole set. They enable to reflect the relations occurring inside the set of both dependent and independent variables. Moreover, they make it possible to observe interdependences between the pairs of variables belonging to different sets. Inside the

set of dependent variables there appears a strong correlation link between variable  $y_2$  (the number of delinquencies per 1 km<sup>2</sup>) and variable  $y_4$  (the number of offenders in relation to the place of their residence per 1 km<sup>2</sup>). It proves the point that districts “generating” criminals are at the same time the areas of the increased delinquency. Correlation links between the pairs of dependent and independent variables are highly sophisticated (Table 1). Therefore, it is implied that spatial structure of the phenomenon under research is shaped by many co-operating factors. It is sometimes increasingly difficult to separate these factors without a thorough study.

Table 1. Correlation coefficients between delinquency indicators and socio-economic variables

Delinquency indicators-dependent variables	Socio-economic characteristics — independent variables	Correlation coefficients
$y_1$ (number of delinquencies per 10,000 inhabitants)	people with primary education	0.475
	people aged 65 and over	0.448
	people with incomplete primary education	0.355
	non-farm maintained population	0.335
	centrally heated dwellings	-0.670
	dwellings equipment with bathrooms	-0.664
	population density per 1 km <sup>2</sup>	-0.327
$y_2$ (number of delinquencies per 1 km <sup>2</sup> )	people with university education	-0.424
	population density	0.721
	two and more storey buildings	0.329
	non-farm maintained people	0.232
	private buildings	-0.383
$y_3$ (number of offenders per 10,000 inhabitants)	farm maintained people	-0.223
	people with vocational education	0.184
	flats equipped with bathrooms	-0.242
	centrally heated dwellings	-0.234
$y_4$ (number of offenders per 1 km <sup>2</sup> )	population density per 1 km <sup>2</sup>	-0.211
	population density per 1 km <sup>2</sup>	0.754
	two and more storey buildings	0.486
	private buildings	-0.488

Coefficient  $y_1$  (the number of delinquencies per 10,000 inhabitants) is positively correlated with the following variables: people with primary education (0.475), people aged 65 and over (0.448), people with incomplete primary education (0.355) and non-farm maintained population (0.335). The compound is negatively correlated with the following variables: centrally heated dwellings (-0.670), dwellings equipped with bathrooms (-0.664), population density per 1 km<sup>2</sup> (-0.327), people with university or equivalent education (-0.424). Correlation analysis proves, to a certain extent, hypothesis (1). The last suggest that spatial differentiation of delinquency is ecologically conditioned. It consists in a concentration of families with low incomes and unskilled workers who occupy sub-standard buildings devoid of basic technical equipment.

Coefficient  $y_2$  (the number of delinquencies per 1 km<sup>2</sup>) is definitely positively correlated with the following variables: population density per 1 km<sup>2</sup> (0.721), two and more storey buildings (0.392), non-farm maintained people (0.232). The coefficient is negatively correlated with the following variables: private buildings (0.383), farm maintained people (-0.223). The correlation analysis proves hypothesis (2) that there exists a certain relation between delinquency and the way the city are as are used. It is obvious that intensive utilization of urban space, especially by service and shopping centres, particularly advantageous conditions for crime commitment. The reason for that is the location of service centres and the decrease of social control in an anonymous crowd.

Coefficient  $y_3$  (the number of offenders per 10,000 inhabitants) is positively correlated with the variable indicating people with vocational education (0.184). It is negatively correlated with the following variables: flats equipped with bathrooms (-0.242), centrally heated dwellings (-0.234), population density per 1 km<sup>2</sup> (-0.211). Correlation analysis indicates a certain relation between crime and such factors as: the level of education and housing conditions. Higher standard urban neighbourhoods that are occupied by people with higher social status do not "generate" delinquencies to the same extent as sub-standard districts, assembling people with lower status, do. It proves, in a way, hypotheses (3) and (4).

Coefficient  $y_4$  (the number of offenders per 1 km<sup>2</sup>) shows a considerable positive relation with the following variables: population density per 1 km<sup>2</sup> (0.754), two and more storey buildings (0.486), flats equipment with bathrooms (0.251). It is negatively correlated with the following variables: private buildings (-0.488), the number of people with incomplete primary education (-0.293), people with primary education (-0.259). Correlative analysis confirms the connection between delinquency, the increasing city space utilization [hypothesis (2)], housing conditions and social status [hypotheses (1), (3) and (4)].

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## THE INFLUENCE OF ECONOMIC CHANGES ON THE TRANSFORMATION OF WARSAW SUBURBAN SETTLEMENTS

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**Abstract.** The development of private enterprises initiated a process of the transformation of urban basic functions and a change in the range of influence of towns. The transformation of two communities situated on the periphery of Warsaw has been described on the basis of the data collected by interviews in all firms operating in the area under investigation. The field research was conducted in the years 1986, 1991 and 1993.

**Key words:** small business, private enterprises, transformation, local community.

The change of the political system in post-communist countries is connected with the shift from a centralized economy to a market economy. The shift constitutes a process whose progress depends on the effectiveness of the government and parliament operations (change of laws and financial policy) as well as on the degree of involvement of the society in the creation of businesses founded on new economic principles. In Poland the process of economic transformation began during the final phase of communist rule, when the government initiated a change in policy toward the private sector. In the years 1980–1985 there were passed about twenty laws to stimulate the development of private business. The new policy, which began in the mid-eighties, effected a rise of enterprises, and intensified the economic growth in the years 1991–1992.

The development of the private sector brought about permanent alterations in the urban landscape manifested in the rise of local service centers, the renovation of old buildings, the construction of many new ones, and decking the streets with advertisements. The number of craftsman service shops increased similarly to quantity and variety of goods supplied by private manufacturers. The nature of these changes can be accounted for the following hypothesis:

**the development of private enterprises initiated a process of transformation of urban basic functions and a change in the range of town's influence.**

The verification of the hypothesis through research, whose results are

presented in the present paper, was confined to the search for answers to five questions.

— Does the development of private enterprises consolidate the function of towns formed during the era of socialist economy? Does it reproduce the urban functions of the pre-Second World War? Or, does it initiate the creation of functional structures of entirely different proportions?

— Are the observed changes permanent — considering the fall of many enterprises after a short period of operation?

— Is the direction of the economic development consistent with the master plans of the communities?

— In what way does the sphere of influence of the communities change during the development of the private sector, and destabilization of the state-owned and cooperative sectors?

— How does the range of commuting to work change?

Answers to these questions are possible on the basis of the analysis of data related to particular enterprises. Some data are available at the Central Statistical Office and from the financial departments of local administrations. Since such a data are inadequate, the basis for the analysis was material elicited by interviews with owners and managers of the enterprises. The exigencies of conducting research in the field restricted the scope of data and the spatial range of examination.

## THE SCOPE OF DATA COLLECTED BY INTERVIEWS

The field work was conducted in two communities situated on the periphery of Warsaw. The scope of the collected data covered the following items: — year of founding the firm, — number of employees, — type of production or service, — range of distribution of goods or services, — type of ownership of the firm and the used premises.

The interviews were carried out in all businesses operating in the area under investigation, including small businesses employing 1–5 persons, since some of them were managerial centers generating employment all over the country (for example, branches of foreign firms operating through distributors), uncommon enterprises (jeweller workshops, music organ constructors, producers of devices detecting forgeries of money and documents, scintigraphic laboratories) wholesale firms, and offices of foundations.

The results of the investigation allowed for an evaluation of the data of the sources of information and permitted to draw the following conclusions.

— The data of the Central Statistical Office cover firms employing over five persons only; thus they cannot be the basis for a full description of the development and the economic transformations;

— Data on employment of the Central Statistical Office and those of the financial departments are lower than they are in reality. The discrepancy results from the fact that owners of firms conceal the employment of family members and that of migrants from republics of the former Soviet Union.

It is difficult to evaluate the discrepancy between the official data and those obtained through field work because the incongruity depends on the size of the settlement, on its situation in the urban space, and on the seasons. In 1993 there were about 30% more employed individuals in the area under investigation than disclosed by the official data.

— The information about the type of business activity is based on the declarations presented by the owners of enterprises at registration of the inception of business activity. The general formulation used commonly at that time facilitated the adjustment of activity to market demands without additional administrative formalities. Such a state of affairs, however, created a situation in which data on the type of activity could be obtained only through interviews of the businesses.

The investigation showed that the data about employment in the private enterprises are marked by error which is difficult to estimate. Therefore, the essential source of information about the transformation of urban basic functions of communities are types of businesses and the changes in the range of the communities' influence defined by the distribution of produced goods and services offered.

## THE TIME SPAN OF FIELD RESEARCH

The investigation of one community began in August 1986 when the development of the private sector was taking place under conditions of the centrally controlled economy. The investigation was repeated in August 1993, that is, under free market economy circumstances. The comparison of the results of both surveys allows for a description of changes over seven years.

The investigation of the other community was conducted in August 1991; it was repeated in 1993. It allowed for an evaluation of changes in an interval of two years.

## AREA UNDER INVESTIGATION

The area of the survey covered Anin and Marysin Wawerski — communities situated on the periphery of Warsaw. During the first investigation both localities manifested characteristics of satellite settlements, that is, their urban basic function was residential, its feature consisted in a high rate of commuting to work in the center of Warsaw. In the few large state-owned enterprises located in the communities the majority of employees were non-residents. The range of operation of service shops did not extend beyond the settlements. The type of services offered by small businesses in Marysin Wawerski in 1991 is presented in Figure 1. The shops did not meet the needs of the residents; the products manufactured in the private businesses were marketed chiefly in the Warsaw voivodship, rarely country-wide. The type of goods produced is illustrated by Figure 2.

If we accept the distribution of produced goods and services offered as the basis for the delimitation of the spatial range of influence of the settlements, then the influence covered the entire Warsaw voivodship (Fig. 3).



Fig. 1. Type of services offered by small businesses in Marysin Wawerski in 1991  
 1 — wholesale stores, 2 — retail stores, 3 — transportation, 4 — administration, health care service, schools, 5 — material craftsmen services, 6 — non-material services, 7 — other, 8 — number of employees: 1-2, 3-5, 6-9, 10-20, 21-100, 101-1000

### THE INFLUENCE OF ECONOMIC CHANGES ON THE TRANSFORMATION OF FUNCTIONS

During the interval between the investigations both settlements developed: The area defined for construction was filled up with cooperative blocks and one-family houses; there was a dynamic increase of stores, service shops, trading firms, and production enterprises. The changes in the landscape of



Fig. 2. Type of goods produced by small businesses in Marysin Wawerski in 1991  
 metal products: 1 — jewelry, 2 — appliances, 3 — hardware goods, 4 — car accessories, 5 — agricultural machinery; chemical products: 6 — cosmetics, 7 — paints, 8 — plastics; light industry products: 9 — textiles, 10 — clothing, 11 — leather products; 12 — food products; 13 — other, 14 — number of employees: 1-2, 3-5, 6-9, 10-20, 21-100, 101-1000

the settlement resulted from a policy which stimulated the development of the private sector and local conditions: — **the location of the settlements** on the periphery of Warsaw which is the center of marketing, transportation, administration of the whole country (ministries are located here), management (administrative headquarters of enterprises), educational institutions which supply qualified workers, scientists and technicians; — convenient **transportation links** with other districts of Warsaw and the hinterland of the city; — **built-up area** featuring a high ratio of one-family houses in which rooms, basements and garages have been adapted for economic activity; — **the availability of free space** which allowed for the construction of production halls, storage facilities and wholesale firms; — **low rents** for room and

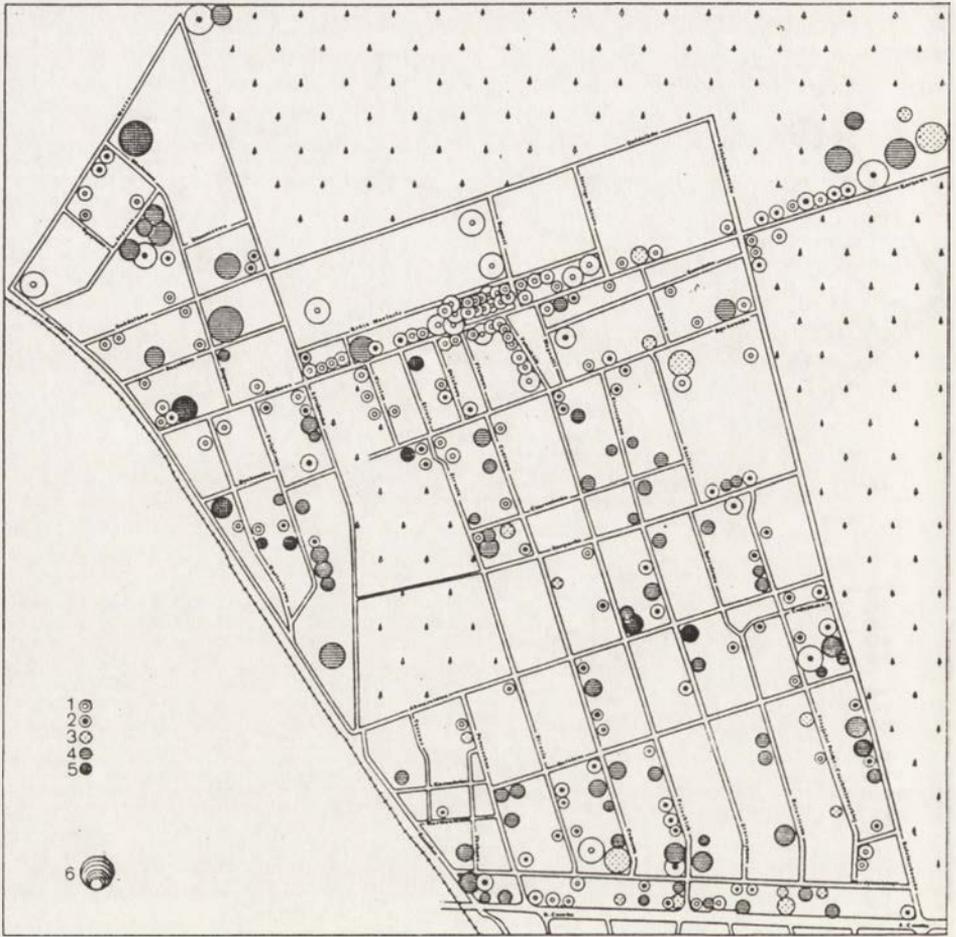


Fig. 3. Range of influence of small businesses in Marysin Wawerski in 1991  
 ranges: 1 — local, 2 — Warsaw and voivodship, 3 — regional, 4 — country, 5 — foreign,  
 6 — number of employees: 1-2, 3-5, 6-9, 10-20, 21-100, 101-1000

plots; — **professional structure of residents** with a high ratio of craftsmen who having lost employment in state factories (during the economic crisis in the eighties) found employment in private firms or initiated economic activities of their own; — **service shortages**.

It can be assumed that the conditions for development of Anin and Marysin Wawerski mentioned above functioned as stimulants of economic transformations in settlements constituting peripheries of all large towns in Poland. The basis for the assumption was the similarity of spatial utilization: the concentration of institutions of basic functions in the city center while the peripheries functioned above all as residential areas of the city, performing only ancillary functions. Due to the development of the private sector the peripheral settlements gained or enriched basic functions. The dynamics and direction of the functional structure of transformations of particular

settlements manifested certain similarities (e.g. the retention of residential priority, increase of service function); at the same time there emerged some differences of development.

### a. Similarities of the development of Anin and Marysin Wawerski

The economic changes manifested themselves in the rise of new firms. It is difficult to ascertain their number for many of them, after a brief period of activity, vanished (Table 1). The fall of the enterprises was accounted by a variety of reasons; among those most often mentioned during the interviews were: — no market for produced goods (higher prices of Polish products than of foreign ones); — the curtailment of cooperation with state factories; — market saturation of some products (the reason for the shutdown of numerous wholesale firms with a countrywide range); — pension age of owners; — lack of experience of owners of new firms. As a result of the rise and fall of many firms, businesses founded prior to 1981 constituted only 30% of businesses operating in 1993. The activity of most of the fallen enterprises ranged over the voivodship and the country; fallen service firms were of local range.

Table 1. Businesses operating in the area under survey according to range of influence\*

Range	Number of businesses in the years					Number of closed-down businesses****
	1986	1991	1993			
			Total	including:		
				new**	uninterrupted operation***	
ANIN — number	201	*	200	124	76	125
including:						
local	68	*	66	42	24	44
voivodship	70	*	61	39	22	48
regional	14	*	19	11	8	6
country	42	*	45	27	18	24
foreign	7	*	9	5	4	3
MARYSIN WAWERSKI						
number of businesses*	*	281	379	141	238	43
including:						
local	*	95	136	55	81	14
voivodship	*	82	106	39	67	16
regional	*	19	20	10	10	3
country	*	78	102	32	70	10
foreign	*	7	15	5	10	0

\* Figures shown in Tables are recapitulations of field work conducted in Anin in 1986, in Marysin Wawerski in 1991 and 1993.

\*\* Founded in Anin in the years 1987–1993, in Marysin Wawerski in the years 1992 and 1993.

\*\*\* Operating in Anin prior to or since 1986, in Marysin Wawerski prior to or since 1991.

\*\*\*\* Closed-down in Anin in the years 1987–1993, in Marysin Wawerski in the years 1992 and 1993.

New firms are small enterprises employing one or two persons (39%) and firms employing from 3 to 5 persons (44%). The local range of 36% of the new businesses reflects the development of ancillary functions performed by stores and craftsman shops. Numerous service firms beyond local ranges of activity (especially those with voivodship and country-wide range) strengthened the settlements' basic functions. Among those firms we find, among others, wholesale businesses, printing shops, advertising businesses, transportation enterprises, construction firms, law offices, and health-care establishments.

Most of the new production enterprises, which employed from 3 to 5 persons, manufactured for a country-wide and voivodship market. The assortment of manufactured goods consisted of metal, wood, chemical, food, textile products, and clothes. The new firms effected only a small increase of employment which was leveled by the decrease of employment in state enterprises. It was therefore necessary to base the description of the transformation of the settlements' functions during the economic changes on the changes of the range of the settlements' influence resulting from the development of activity and the quantitative increase of businesses. The basis for the determination of the extent of activity of the firms was the spatial range of the offered services and distribution of the products.

During the period of investigation the firms in Anin strengthened their position on the regional, country and foreign markets, while the firms in Marysin Wawerski widened their commercial cooperation and developed a network of businesses serving the needs of the local population. The elimination of numerous cooperatives whose products were directed to central institutions synchronizing cooperation with state-owned industry, caused a decline of the percentage of firms with voivodship range (Table 2.)

Table 2. Range of influence of businesses

Range of influence years	Anin		Marysin Wawerski	
	percentage of businesses in the			
	1986	1993	1991	1993
number of businesses	201	200	281	379
percentage of businesses	100	100	100	100
local range	34	33	34	36
voivodship range	35	30	29	28
regional range	7	10	7	5
country range	21	22	28	27
foreign range	3	5	2	4

The range of influence determined by commuting to work shrank considerably, caused by the reduction of employment in state-owned factories and craftsman cooperatives; the reduction effected mostly commuters. At the same time the increase of intra-urban migration was connected with the arrival of highly qualified individuals and persons employed in firms which have been moved from central districts of the town.

### **b. Differences in the development of the settlements**

Anin, located in a forested complex, is part of a chain of settlements in which during the inter-war period people with lung illnesses were treated. The private sanatoriums, founded at that time, were closed down after the Second World War; they were replaced by state clinics and hospitals. After 1985 private hospitals, health-care centers, medical cooperatives, and analytical laboratories were opened. Their fast establishment was aided by the concentration of medical personnel who due to the low salaries in state health-care institutions were induced to take up extra employment in private medical establishments.

In view of the personnel's specialized skills and their high qualifications these new health-care businesses increased the range of influence of the settlements over the entire country. Marysin Wawerski, though bordering with Anin and the forested complex, did not develop health-care functions. During the communist period there were constructed several state factories whose production activity slowed down during the period of investigation. The drop in production resulted in a lowering of the range of influence of the factories on the regional and country markets as well as in a reduction in commuting from the suburban zones. Due to the above-mentioned advantages of localization, the development of private firms resulted from the closeness of an absorptive market which determined the type of production.

## **CONCLUSIONS**

The development of private businesses initiated the process of transformation leading to a restitution of former functions or — as in the case of new satellite settlements — to an enrichment of the functional structure. The economic transformations increased the range of influence of the settlements, enlarged commuting from other districts of the town, and limited the hinterland. The durability of the ascertained transformations and the continuation of the changes depend on the economic policy of the government.



## MILIEU NATUREL ET EVOLUTION DE LA PRESENCE HUMAINE DANS LES MONTAGNES DES ABRUZZES

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**L'abstraction.** La première partie décrit le milieu naturel des montagnes des Abruzzes (présentation de la structure géologique, l'hydrographie, des noeuds orographiques, de la faune et de la végétation). La deuxième partie est consacrée aux problèmes de la présence humaine dans les montagnes de Abruzzes à partir du paléolithique inférieur jusqu'à nos jours.

**Les mots clés:** les montagnes des Abruzzes, l'homme et le milieu naturel, le développement.

La chaîne des Apennins représente dans le territoire des Abruzzes le lieu où se manifestent les altitudes maxima et où s'expriment une majesté et une variété de formes tout à fait singulières.

Suivant un parallélisme assez régulier, les massifs montagneux présentent une série de cuvettes intérieures où se localise l'habitat et dont l'utilisation se différencie souvent profondément des versants des reliefs qui les entourent.

Le massif du Gran Sasso occupe, avec les Monts de Laga, le secteur le plus septentrional de la région et atteint au Corno Grande l'élévation maximum de l'ensemble du système montagneux. La majestueuse masse calcaire montre une rudesse qui rappelle parfois le paysage des Dolomites (Corno Piccolo) et accueille, à une altitude de 2700 m, un petit glacier, le seul de la chaîne des Apennins et le plus méridional d'Europe. Le versant occidental du massif présente, avant d'atteindre la cuvette de L'Aquila, un très vaste poljé de plus de 30 kilomètres de long et d'une largeur qui varie de 6 à 12 kilomètres: Campo Imperatore.

Ce spectaculaire haut plateau karstique est encadré par le Corno Grande, qui le borne au Nord, et par les cimes du Prena (2561 m), du Camicia (2570 m) et du Brancastello (2387 m).

L'ensemble du territoire qui se développe au-dessus de 1500 m d'altitude n'est que très faiblement habité et représente une oasis naturelle, récemment protégée par l'institution d'un parc national.

Le massif du Gran Sasso est limité au Sud par le cours du fleuve Pescara, qui le sépare de la montagne du Morrone-Maiella.

Plus uniforme et moins accidentée, la Maiella est considérée comme le siège des légendes et des traditions qui depuis toujours ont influencé et

caractérisé la vie spirituelle et le folklore des populations installées sur ses pentes et dans les territoires environnants. Tout en ayant une altitude plus modeste que le Corno Grande (Mont Amaro, 2793 m), elle personnifie communément, plus que tout autre montagne de la région, le territoire, l'opiniâtreté et le caractère de la population des Abruzzes. Son nom revient souvent aussi bien dans les imprécations que dans les invocations de tous ceux qui en subissent le charme, d'une façon quasi mystique.

Le massif du Velino-Silente est le plus interne du territoire des Abruzzes. Séparé du Gran Sasso et de la Maiella par la Conca Peligna, la Vallée Subequana et le Piane di Navelli, ce massif se pousse, avec les Monts Carseolani, jusqu'aux limites administratives, aux confins du Latium.

Délimité au Sud par le bassin du Fucino, le massif se situe au centre de la péninsule, à peu près à égale distance des côtes de la mer Tyrrhénienne et de la mer Adriatique. Avec ses 2487 m, le Velino est la troisième cime, en altitude, du système des Apennins. C'est précisément cette position relative par rapport aux mers qui lui a valu des modifications plus nettes; il porte donc les traces des glaciations. Matériaux morainiques accumulés, cirques glaciaires, rochers et manifestations karstiques en surface, caractérisent le paysage de cet énorme massif calcaire.

Insuffisamment peuplé sur ses pentes et sur ses flancs, le massif présente un haut plateau qui se déroule sur plus de 20 kilomètres, sur un axe Nord-Sud et à une altitude de l'ordre de 1300–1500 m, et où l'on trouve d'importants habitats comme Rocca di Cambio, Rocca di Mezzo, Rovere et Ovindoli.

Ce qui caractérise l'Apennin Central des Abruzzes est l'absence de reliefs qui anticipent la naissance des cimes les plus élevées: on passe directement d'une zone de basses collines aux plus hauts sommets du massif.

Hormis quelques exceptions (les Monts de la Laga), l'ensemble de la chaîne est constitué de roches calcaires, bien que de composition variée, qui en ont conditionné la morphologie, l'hydrographie, la végétation et, en dernier lieu, l'habitat.

L'orographie particulière apparaît bien, même lors d'un examen sommaire, comme la raison d'une hydrographie considérable, complexe et originale.

L'originalité la plus remarquable sans doute nous est fournie par la présence d'un glacier qui est, comme nous l'avons rappelé, l'unique de la chaîne de l'Apennin et le plus méridional d'Europe. Au milieu des crêtes du Corno Grande (cime Orientale, 2903 m; Centrale, 2893 m et Occidentale, 2912 m), qui l'encerclent presque complètement, dans un profond affaissement, une masse de glace éternelle a comblé un cirque qui s'est formé au cours des alternances climatiques de l'ère quaternaire.

A une altitude de plus de 2800 m, le glacier s'étend sur une longueur d'environ 400 m et sur une largeur maximum de 250 m. Les données concernant la surface sont variables selon les années: la tendance est cependant à une légère diminution de la masse glaciaire. Malgré ses modestes dimensions le glacier du Calderone exerce une influence considérable sur l'hydrographie hypogée et sur les nombreuses résurgences qui jaillissent à la base de la masse calcaire.

Une autre curiosité est Fonte Grotta, qui a été définie comme la plus haute résurgence pérenne de l'Apennin. L'eau jaillit, à 2050 m d'altitude, d'une cavité qui s'enfonce sur plus de 300 m, riche de stalactites, de stalagmites et de nombreux petits lacs. Les fleuves qui atteignent une certaine importance sont, du Nord au Sud: le Tronto (115 km) qui prend sa source dans les Monts de la Laga et qui marque la limite administrative avec les Marches; le Vomano (75 km), qui doit son importance à la production d'énergie électrique; le Sangro (117 km) qui naît dans le territoire du Parc National et qui représente le second fleuve de la région, tant par sa longueur que par l'ampleur de son bassin; le Trigno (85 km), qui marque en grande partie la limite avec le Molise.

De nombreux cours d'eau, qui coulent presque tous perpendiculairement à la côte, prennent leur source dans les montagnes des Abruzzes. Tous plus ou moins caractérisés par une nature karstique qui en règle la portée et le régime. Le Pescara, le plus important des fleuves de la région (145 km), est aussi un des fleuves les plus longs du versant Adriatique au Sud du Pô. De nombreux affluents l'alimentent, tels que le Sagittario, le Tirino, l'Orte et la Nora.

Comme nous l'avons vu, nombreuses sont les sources Karstiques, abondantes, pérennes et parfois d'un grand intérêt en ce qui concerne la faune et le paysage. La source la plus riche en eau, et sans aucun doute la plus intéressante de la région, est bien celle de Capo Pescara, située près de la ville de Popoli, au bord septentrional de la Conca Peligna.

L'ensemble des résurgences qui la constituent, et le lac adjacent qui s'y forme a été récemment protégé par la constitution d'une réserve naturelle.

Dans les parages, se trouve aussi la source Giardino, dont les eaux sont captées et distribuées parmi les nombreuses communes de la Vallée du Pescara, y compris les deux chefs-lieux de province.

De même que le Pescara, le Tirino prend naissance des nombreuses sources distribuées sur les flancs des montagnes qui encadrent la Conca di Capestrano: Capo d'Acqua e Lago di Capestrano sont les exemples les plus remarquables de cette zone particulièrement riche en sources.

La Maiella présente aussi tout autour une couronne de sources caractérisées plus par leur nombre que par leur débit.

Les sources du Verde, à proximité de Fara San Martino, constituent l'un des facteurs fondamentaux de la localisation et du développement d'importantes industries pour la production de pâtes alimentaires qui se sont affirmées sur les marchés du monde entier (De Cecco — Del Verde — et de nombreuses autres encore, de plus modestes dimensions mais de qualité tout aussi excellente).

Par leur côté hautement spectaculaire, les résurgences de l'Imele, près de Tagliacozzo, méritent aussi d'être mentionnée, de même que celles de Stiffe, dans la Vallée de l'Aterno, dont la valorisation touristique est à peine commencée et qui représentent déjà un lieu d'excursion très fréquenté.

En ce qui concerne l'hydrographie, il faut encore rappeler que le massif des Abruzzes renfermait la plus vaste cuvette lacustre de la péninsule. Le

troisième lac d'Italie en superficie a été en effet desséché dans la seconde moitié du XIX<sup>e</sup> siècle, pour créer une vaste plaine (plus de 160 km<sup>2</sup>) dont l'intérêt rural est considérable.

De nos jours, les montagnes des Abruzzes comptent un seul "grand" lac, d'une surface de 1 km<sup>2</sup>. Créé à la suite d'un éboulement qui, dans le passé, a obstrué le cours du fleuve Tasso, à proximité de l'agglomération de Scanno et à une altitude d'environ 1000 mètres, ce lac constitue un lieu touristique très fréquenté tant pour les excursions d'une journée que pour de plus longs séjours de vacances.

Les autres cuvettes lacustres naturelles, que l'on peut trouver dans ces montagnes, sont toutes de très modestes extensions et presque toujours de nature karstique. Il s'agit donc de surfaces variables qui, dans les périodes d'alimentation maximum, dépassent difficilement 1 hectare. Parmi les rares exceptions, il faut signaler le Laghetto, sur les plateaux de Ovindoli, qui, aux périodes de forte pluviosité et de fonte des neiges, peut atteindre une extension de 7 à 8 hectares.

En revanche, le lac Sinizzo à San Demetrio ne'Vestini présente un certain intérêt: outre qu'il recueille les eaux météoriques dans une doline d'effondrement, il est aussi alimenté par une source pérenne.

Parmi les lacs artificiels, il faut rappeler celui de Campotosto, sur les Monti della Laga, à une altitude dépassant les 1300 m, qui constitue, avec 15 km<sup>2</sup> environ, le plus vaste bassin de la région. Il s'agit en effet d'une cuvette lacustre naturelle, agrandie par la construction de barrages de retenue.

Le lac de Barrea atteint aussi une extension comparable grâce au barrage de la partie supérieure du cours du Sangro, à une altitude de 1000 m. Comme tous les lacs artificiels de ces montagnes, il est destiné à la production d'énergie électrique.

Le patrimoine forestier et faunique des montagnes des Abruzzes est particulièrement intéressant. L'érosion karstique, par tout présente, laisse de grandes surfaces dépouillées d'arbres; mais sur les débris de pente ou, d'une façon plus générale, là où l'enracinement est possible, la forêt apparaît avec une luxuriance spectaculaire. Les différences de milieu (altitude, exposition, nature des sols, régime pluviométrique) ont contribué à une diversification des essences, déterminant ainsi des paysages végétaux variés qui émanent tous une forte suggestion.

Naturellement, la faune aussi se présente entièrement, riche et parfois originale: le loup de l'Apennin, l'ours de la Marsica, le chamois, le renard, le chat sauvage, la belette, le blaireau, la loutre.

L'avifaune, tant non-migratrice que migratrice, est extrêmement riche d'exemplaires et variée dans chaque espèce: l'aigle royal, qui vit d'une manière stable dans les hautes altitudes, la buse, l'épervier, et tant d'autres.

La protection de ce patrimoine a été confiée à une institution qui, bien que remontant à une époque lointaine (1922), n'a réussi que dans ces dernières décennies à intervenir de façon concrète pour réaliser ses objectifs institutionnels.

Le Parc National des Abruzzes, avec une superficie totale d'environ

100,000 hectares (dont 40,000 sont soumis à un régime de contrôle strict et 60,000 sont considérés comme zone à respecter) se déploie à cheval sur les régions des Abruzzes, du Latium et du Molise.

Son enceinte protège des espèces florales extrêmement intéressantes, comme le chêne chevelu, l'érable, le bouleau, l'if, le pin noir, le pin mugho, outre les vastes forêts de hêtres et plus d'un millier d'espèces de plante s supérieures.

Le Gouvernement italien a récemment pris des mesures pour créer dans la zone montagneuse des Abruzzes, deux autres parcs nationaux et plus précisément le "Parc National du Gran Sasso et des Monts de la Laga" et le "Parc National de la Maiella-Morrone".

La protection du milieu montagnard est complétée par des réserves (Orfento, Capo Pescara, Lac de Penne) et par la création récente du "Parc Naturel Régional du Sirente-Velino" (opérationnel depuis le 2/7/92).

Pour conclure sur ce point, on peut remarquer que les noeuds orographiques signalés au début de cet exposé ont été tous les trois l'objet de mesures tendant à la sauvegarde d'un patrimoine naturel, historique, folklorique, architectural, certainement digne de la plus haute considération.

Dès la préhistoire, l'homme s'est établi dans ce remarquable milieu naturel, et nombreux sont les témoignages de sa présence, à partir du paléolithique inférieur. La multiplicité des paysages, les différentes situations du milieu, la possibilité de se défendre, l'approvisionnement en eau, la présence des forêts, une faune certainement riche, et, plus tard, des cuvettes et des plateaux intérieurs adaptables à l'agriculture et à l'élevage, justifient amplement la présence de nombreux objets préhistoriques distribués dans toute la zone montagneuse. Si l'on ajoute à cela la présence abondante de silex, matière première pour la fabrication d'outils en pierre, et la découverte de restes d'animaux de nos jours disparus (*Elephas Meridionalis*, hyppopotame, rhinocéros, boeuf primitif, etc.), on peut aisément se faire une idée aujourd'hui de la diffusion de l'homme, durant ces premières périodes de son histoire, dans les hautes régions de l'Apennin des Abruzzes.

Dresser la liste des gisements de matériau lytique présents dans la région et appartenant aux différents moments qui échelonnent la paléontologie humaine se révélerait une tâche difficile, et tout compte fait inutile, étant donné que ces traces sont présentes un peu partout en surface et dans le sous-sol immédiat. Il faut toutefois remarquer les gisements de la Vallée Giumentina (Maiella) et ceux des Svolte di Popoli (Gran Sasso Méridional), particulièrement représentatifs des industries du paléolithique inférieur-moyen retrouvées dans le territoire des Abruzzes. Les traces de présence humaine dans la zone de collines sont naturellement tout aussi dignes d'intérêt, en raison surtout de leur distribution et de leur densité.

L'empreinte romaine aussi est fortement marquée et l'on trouve d'abondants traces et restes assez bien conservés. On se contentera de signaler que ces témoignages sont largement présents dans les zones de montagne et sont tous situés à des altitudes plutôt élevées, aux alentours des 1000 m: Campovalano (pentes Nord-Orientales des Monts de la Laga), Amiternum

(près de L'Aquila), Alba Fucens (sur les pentes du Velino qui surplombe au Nord le bassin du Fucino), Juvanum (sur les pentes Sud-orientales de la Maiella) figurent parmi les sites les plus connus, tandis qu'aujourd'hui encore s'intensifient les recherches et les fouilles.

Faisant un saut de plusieurs siècles, nous nous trouvons à partir du XIII<sup>e</sup> siècle dans une montagne qui laisse entrevoir une richesse qui se concrétise dans de nombreux châteaux, églises, demeures et constructions réalisés en général avec une réelle recherche, aussi bien dans la conception d'ensemble que dans l'exécution des détails (fenêtres et portails finement sculptés, etc.). C'est là la période qui a vu se succéder, dans les Abruzzes, les dominations des Normands, des Souabes, des Angevins, des Aragonnais, des Espagnols et des Bourbons.

Toute l'histoire des gens des Abruzzes s'est déroulée dans les coulisses de ces montagnes et ce n'est que rarement qu'elle a intéressé la zone de collines (Teramo, Atri, Penne, Chieti, Lanciano).

La zone côtière, au contraire, jusqu'à la moitié du XIX<sup>e</sup> siècle, n'a jamais représenté le moindre intérêt pour la région: les habitats ne se limitaient qu'à quelques centres (Cerrano, Aternum, Vasto) et la population éparsée était pratiquement absente. La côte, dénuée de lieux d'abord facile, n'offrait pas une liaison efficace pour les communications maritimes; en outre, la région côtière avait tendance à devenir marécageuse, et donc insalubre.

Il pouvait y avoir quelque centre sur les collines voisines de la côte, mais le reste n'était que marécage, pinède, solitude.

C'est donc la région montagneuse, avec ses vallées fluviales et ses cuvettes intérieures, qui a constitué le noyau essentiel de l'histoire et de l'économie du territoire des Abruzzes.

Les centres sur les sommets et sur les pentes, retranchés sur les monts, se développaient à proximité des sols d'origine alluviale et karstique aussi bien pour des raisons de sécurité et de défense, que pour pouvoir se procurer plus facilement la matière première (pierres); en outre ces rares espaces cultivables rendaient possible la pratique de l'agriculture. Une agriculture naturellement pauvre, mais pas pour autant moins significative, spécialement si on la rapporte au tableau de la situation sociale de l'époque.

C'était toutefois l'élevage des moutons qui représentait l'activité propulsive des montagnes des Abruzzes: les troupeaux, qui se déplaçaient périodiquement du Latium et des Pouilles vers les pâturages d'été situés en haute montagne, apportaient avec eux non seulement des richesses matérielles mais aussi des échanges de culture, d'idées, d'informations.

La transhumance et l'élevage des ovins étaient si importants qu'ils avaient convaincu les autorités de l'époque à instituer des parcours que les troupeaux pouvaient et devaient suivre lors de leurs déplacements: les "tratturi". Rares sont aujourd'hui les témoignages en mesure de révéler les tracés de ces sentiers herbeux, atteignant parfois jusqu'à plusieurs dizaines de mètres de largeur. Sans doute peut-on en voir les marques les plus évidentes dans la présence de ces constructions en pierres, aux formes semblables à des églises, où les bergers et leurs troupeaux trouvaient un abri durant leurs migrations.

Il s'agit de ces édifices jamais ouverts au culte, où l'on n'a que rarement célébré le rite de la messe. Un exemple classique est fourni par l'alignement que l'on relève sur le Piane di Navelli.

Le territoire de montagne a joué un rôle important dans l'histoire des modes de vie et de la culture des Abruzzes. Et la population de la région a longtemps conservé un lien étroit avec le milieu montagnard dont elle provient.

Grâce à sa morphologie accidentée qui l'a privée, jusqu'à il y a quelques dizaines d'années encore, de voies de communication accessibles, la montagne a conservé un patrimoine de culture et de civilisation qui, aujourd'hui seulement, en raison des mutations socio-économiques, est inexorablement en train de disparaître. Une culture fortement conditionnée par les caractéristiques naturelles d'un territoire qui dictait ses lois sévères et précises.

Une première remarque concerne l'absence de maisons éparses: la préférence était pour une concentration en gros villages agricoles et pastoraux, liés aux nécessités d'assistance mutuelle aussi bien durant les longues périodes hivernales que pour faire face à des impératifs défensifs.

On peut ainsi rencontrer à l'intérieur de nombreux centres (Santo Stefano, Castel del Monte, Rocca Calascio), de fréquents passages "couverts", comme des arcades en couloir-galerie, qui permettaient les contacts lors des chutes abondantes de neige.

Vues de l'extérieur, en revanche, ces agglomérations ont l'aspect de véritables châteaux ou forteresses, où les habitations périphériques ont fonction de rempart et n'offrent, par conséquent, ni prises et ni fenêtres.

La concentration se justifiait en outre par les activités exercées, qui se basaient en grande partie sur l'élevage des ovins et sur les produits dérivés: laine, lait, viande représentaient la matière première qui alimentait une série de transformations au niveau artisanal et familial.

La montagne, qui au Moyen-Age et au début de l'époque moderne pouvait être considérée le siège de l'habitat le plus significatif des Abruzzes, connaît au début du siècle actuel un exode de population impressionnant.

Révélatrices à ce sujet sont les données relatives aux variations de population entre les recensements de 1861 et de 1961: dans la zone du Gran Sasso, la population de Santo Stefano di Sessanio a diminué de 70%, celle de Calascio de 68%, celle de Pietracamela de 51%; Salle, sur les pentes de la Maiella en a perdu 60%; Gagliano Aterno e Barete, dans la Vallée de l'Aterno, plus de 50%; et il en est de même de la plupart des centres de montagne.

Après 1961, le phénomène de l'exode ne s'est pas arrêté, si bien qu'il y a des centres qui sont aujourd'hui complètement abandonnés: Rocca-caramanico, Salle Vecchio, Rocca Calascio.

Même si les pourcentages ont été par la suite plus modestes, la diminution de la population a continué à intéresser presque toute la montagne. Les exceptions sont pratiquement représentées par les villages de la région du Fucino: Avezzano, Trasacco, Celano, etc.

Les causes principales de cette "fuite" sont certainement à rechercher dans un profond changement des modes de vie et dans une évolution socio-économique qui a poussé les jeunes générations à migrer soit vers l'intérieur,

vers la côte désormais bonifiée, soit vers l'étranger, vers le Canada, les Etats-Unis, l'Argentine, le Venezuela et l'Australie. Ce n'est qu'à partir des années 60 que le flux se dirige aussi vers Europe, spécialement la France, la Suisse et l'Allemagne.

La productivité marginale des sols agraires, les éboulements, les tremblements de terre, la difficulté des communications, auxquels s'est ajouté le désir de s'évader d'un isolement mortifiant ont transformée la montagne en une contrée abandonnée et désertée par tous ceux qui avaient la possibilité et la capacité d'émigrer.

Les résultats de cette émancipation, ont été le vieillissement de la population et en conséquence un déséquilibre marqué entre mortalité et natalité, demême que sa féminisation, étant donné la nette supériorité numérique des femmes sur les hommes.

On assiste à partir des années 80 à un retour d'intérêt graduel pour la montagne des Abruzzes.

Les versements des émigrés ont permis la récupération de centres dépeuplés et semi-abandonnés. De même, les terrains qui avaient été laissés incultes ont été récupérés grâce à l'utilisation de fertilisants chimiques, à l'introduction de nouvelles cultures, à la valorisation de productions agricoles traditionnelles (blé épeautre, légumes, olivier, vigne de qualité, A.O.C.), à la mécanisation et à l'irrigation: ce sont là les conséquences d'une nouvelle richesse, tant sur le plan financier qu'en ce qui concerne l'évolution culturelle de ceux qui, ayant émigré, se sont trouvés au contact de sociétés plus riches et plus avancées.

Les migrations de retour ont certainement introduit des innovations significatives dans les activités rurales, comme la création de coopératives et de consortiums qui ont favorisé la diffusion du "produit naturel", spécialement en ce qui concerne l'élevage traditionnel et celui de nouvelles espèces (par exemple, parmi les bovins, la diffusion de la race brune des Alpes).

Le réseau routier a été amélioré, par la construction et la modernisation des routes ordinaires, aussi bien que par la réalisation d'autoroutes, qui, contraintes à traverser une région "difficile", se présentent au bas mot hardies, avec un fort pourcentage de viaducs et de tunnels sur le développement total du tracé. Le tunnel du Gran Sasso (11 km environ) celles de San Domenico et de San Rocco (toutes deux d'environ 4 km), de même que le viaduc en virage de Pietrasecca, en sont les exemples les plus remarquables.

Ces infrastructures ont donné la possibilité aux habitants des vieux centres récupérés ou en cours de récupération d'avoir un emploi même fort éloigné, dans une des zones industrielles qui progressivement sont apparues un peu partout.

L'accroissement de la mobilité a tout naturellement diminué l'isolement, faisant disparaître ce sentiment de frustration qui avait longtemps affligé les populations de ces montagnes.

Ces dernières décennies ont vu la montagne des Abruzzes s'ouvrir timidement au tourisme et, excepté quelques cas particuliers (Roccaraso, Tagliacozzo), cela a représenté une vague de nouveauté sur un territoire resté longtemps

en marge, tout en se trouvant au milieu de deux zones fortes comme la bande thyrrénienne Rome-Naples et la conurbation de la côte adriatique. Ce fut au début un tourisme sportif, qui s'est accompagné de la réalisation de pistes de ski et d'équipements de remontée (téléphériques, télésièges et téléskis), un tourisme d'élite et le plus souvent limité à une excursion dominicale; aujourd'hui, au contraire, les Abruzzes peuvent compter sur une trentaine de stations de ski, fréquentées durant toute la saison d'hiver, tout en conservant des "pointes" de grande affluence les week-ends.

La montagne a connu ensuite la "mode" de la résidence secondaire, qui s'est diffusée plus en tant que statut symbolique que pour de véritables nécessités, étant donné la sous-utilisation effective de ces logements, souvent par ailleurs de dimensions réduites. S'il est vrai que le phénomène de la résidence secondaire a apporté des avantages indéniables au secteur du bâtiment et — dans une moindre mesure, toutefois — à l'économie globale de la montagne, il n'en reste pas moins que le paysage a souvent subi de considérables mortifications, vu que les résidences et, parfois, des agglomérations entières ont été réalisées sans respecter le milieu naturel, en le gâchant par des formes et des dimensions peu appropriées.

La montagne des Abruzzes, aujourd'hui, en dépit d'un passé caractérisé par un isolement presque absolu, se présente comme une zone industrialisée, où l'innovation technologique a atteint, dans certains secteurs, des niveaux de retentissement mondial.

Les laboratoires du Gran Sasso ont été réalisés en creusant de nombreux locaux dans les entrailles de la montagne, pour permettre l'étude de phénomènes bio-physiques particuliers à l'abri des radiations cosmiques.

Plus de 500 savants et chercheurs de toutes les nationalités y effectuent des expériences qui sont du plus haut intérêt pour la communauté scientifique mondiale.

Dans la cuvette du Fucino de nombreuses antennes paraboliques ont été installées pour les émissions et les communications par satellite, qui mettent l'Italie en mesure d'être reliée directement et de façon permanente au reste du monde. C'est en outre de la station de Telespazio que partent les signaux qui guident la navigation commerciale maritime, et c'est là que sont opératoires les services de relèvement à distance qui fournissent des informations fondamentales pour l'étude des milieux naturels et habités d'une vaste zone de notre planète.

Les données relevées sont élaborées à l'aide d'instruments extrêmement perfectionnés, et transformées en informations concrètes dans les plus brefs délais. Telespazio enfin est le concessionnaire exclusif du Ministère des Postes et Télécommunications pour l'installation et l'exercice, en Italie, des systèmes de télécommunication par satellite, et, entre autres choses, contrôle et trie la totalité des signaux des stations de télévision.

Italtel est un autre complexe industriel de grandes dimensions, qui a son siège près de la capitale de la région et qui peut être considéré comme la plus importante industrie italienne dans le secteur des appareils de communication. Italtel, qui compte près de 5000 employés, doit être rappelé non

seulement pour ses efforts dans la recherche et pour les solutions techniques adoptées, mais aussi pour avoir introduit le premier et dans des proportions considérables le travail féminin dans la grande production industrielle. La femme qui était caractérisée, dans la tradition des Abruzzes et en particulier dans ces zones de montagnes, par un état de subordination dans le contexte agro-pastoral, accède à la classe productrice ouvrière d'une façon révolutionnaire en bouleversant la tradition.

L'industrie chimique de Bussi sul Tirino a été le premier grand complexe industriel créé dans la région montagneuse des Abruzzes, grâce à la présence d'eaux pures qui interviennent dans les cycles productifs, à la possibilité de production d'énergie électrique d'origine hydrique, à l'abondance de main-d'oeuvre et à une position qui la mettait à l'abri de possibles incursions aériennes. L'installation, de nos jours encore en fonction bien qu'elle ait changé plusieurs fois de ligne de production, emploie 800 personnes. A Scopito, près de L'Aquila, le colosse multinational HOECHST a réalisé un important complexe industriel pour la recherche et la fabrication de spécialités pharmaceutiques connues dans le monde entier.

Parmi les secteurs industriels "mûrs", les installations du secteur alimentaire sont, comme nous l'avons signalé plus haut, particulièrement importantes, en raison de la grande diffusion et de la notoriété de leur production. La présence de résurgences karstiques est à la base du développement des fabriques de pâtes alimentaires dans la zone située au pied de la Maiella (Fara S. Martino) et d'une grosse installation d'élevage de truites et d'esturgeons dans la Conca di Capestrano. La présence et l'abondance d'eau est encore à mettre en relation avec les installations d'embouteillage de Coca Cola (Fara Filiorum Petri, Corfinio) et de brasserie (Popoli, en cours de reconversion d'entreprise). Enfin, parmi les activités traditionnelles, les cultures d'amandiers, un des rares arbres qui s'enracinent sur les hauts plateaux calcaires, ont favorisé la localisation de fabriques de dragées à Sulmona (Pelino, Di Carlo) et de nougats (Nurzia, Palmerio) à Guardiagrele.

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## RECENTS CHANGEMENTS DANS LE PAYSAGE COTIER DES ABRUZZES

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**L'abstraction.** Présentation du milieu côtier des Abruzzes. Analyse rétrospective des processus sociaux et cultures qui ont amené les grands changements de la zone adriatique. Naissance de l'Europe Communautaire comme une nouvelle chance pour l'avenir de la côte. Tourisme balnéaire — facteur important dans la modification du paysage côtier.

**Les mots clés:** le paysage côtier des Abruzzes, l'aménagement de la zone côtière, le développement.

“Nous avons besoin du passé, dans tous les cas, pour donner un sens au paysage” étant donné que “l'expérience précédente nuance toute la perception présente”. Ainsi Löwenthal (1975) exprimait-il, en des termes extrêmes, l'importance du devenir historique dans l'interprétation du paysage qui prenait ainsi une valeur sociale et culturelle; un passage forcé pour atteindre la conception holistique qui récupère ce sens d'identité du paysage en le rendant patrimoine fondamental et donc hérité, indispensable à nous autres hommes.

C'est là une clef de lecture efficace pour interpréter les récents changements du paysage côtier des Abruzzes qui, durant les derniers cent ans, a vu l'arrangement de son territoire se modifier radicalement en faveur d'un élargissement de l'espace côtier, transformé de simple espace de transition à espace de relation. Résultat d'une évolution qui, dans le temps, a scandé une attitude différente de l'homme vis à vis du milieu à travers un processus lié, fondamentalement, à une utilisation purement économique de la côte, en parfait accord avec la thèse ricardienne selon laquelle “le territoire est la marchandise la moins onéreuse pour ceux qui détiennent le pouvoir”.

Cela justifie l'aménagement actuel de la zone côtière qui se présente comme un système complexe issu de la poussée d'une intense urbanisation et d'un refaçonnement socio-économique peu soucieux de sauvegarder les contenus naturalistes, et soumis pour cette raison à l'action de forces entropiques.

Ce système complexe “prend appui” sur un milieu côtier qui se développe sur 129 kilomètres, de la limite régionale avec les Marches, marquée par le fleuve Tronto, à celle du Molise, marquée par le fleuve Trigno. Le profil

côtier, en descendant du Nord au Sud, se présente dans son ensemble rectiligne, avec un littoral sablonneux, ample et compact sur sa première partie jusqu' à Torre Mucchia, au Nord de Ortona, où la côte, dominée par de fréquentes falaises et des hauteurs surplombantes, devient inaccessible. Successivement les embouchures des fleuves Sangro et Sinello bornent une partie de côte caractérisée par une pinède épaisse et bien entretenue, témoignage résiduel du maquis méditerranéen, alors qu'un peu plus au Sud, le profil côtier atteint sa projection maximum en mer, au promontoire de Punta Penna, avant de continuer en maintenant ses caractères de côte abrupte et élevée, jusqu'aux limites du Molise.

Le tissu territorial qui caractérise la zone côtière, tout en présentant une épaisseur indéfinie, ou mieux encore flexible, est le résultat de l'action de deux réalités physiques de la région: la chaîne des Apennins et la mer Adriatique. Si d'un côté celles-ci lui confèrent l'aspect d'une étroite lisière alluviale, qui ne trouve qu'en correspondance de quelques embouchures fluviales la possibilité de s'élargir en des plaines exigües, d'autre part elles font ressortir la préciosité du territoire, en particulier à la lumière d'une orographie accidentée à laquelle il manque, dans ses extrêmes contreforts de collines, le support d'un sol stable. Les glissements de terrain qui ont eu lieu ces dernières années dans le territoire de Chieti, mettent en évidence des réalités physiques et hydro-géologiques plutôt préoccupantes.

L'importance de la zone côtière et le rôle prioritaire qu'elle a joué dans l'organisation du territoire régional, qui, avec le temps, conduira à un renversement des gravitations entre Abruzzes intérieurs et Abruzzes côtiers, apparaît à travers une analyse rétrospective filtrée par des processus sociaux et culturels. Sans vouloir faire appel à des canons de déterminisme historique, on ne peut ignorer l'objective réalité d'un paysage côtier lié plus à l'arrière-pays qu'au littoral, marqué par un mode de vie caractérisé par un détachement de la mer, perçue par la population plus en tant que borne d'un système territorial qu'en tant que moyen de liaison. Tout ceci aujourd'hui se reflète dans l'absence de relation précise entre zone côtière et système portuaire, dépourvu de toute fonctionnalité et organisé plus pour des exigences d'accostage que pour des exigences d'appareillage; cela se reflète aussi dans la présence d'un système économique productif lié depuis toujours à l'infrastructure routière et ferroviaire, de même que dans l'existence d'un "continuum urbanisé" qui voit dans la mer une barrière naturelle à son expansion. La ville même de Pescara, tout en étant sur la côte, s'est affirmée impérieusement sur le territoire en continuant à "ne pas être un port", mais plutôt le centre-guide d'un arrière-pays qui petit à petit "perdait sa ruralité pour acquérir son industrialisation".

Dans le passé, le faible rapport des gens des Abruzzes avec la mer a été déterminé par des facteurs tant culturels que physiques et géographiques. Dans l'antiquité déjà, l'habitat excluait la côte et les fonds de vallée en faveur de la colline: le littoral apparaissait presque désert, ne comptant que deux centres habités, Castrum Novum (Giulianova) et Aternum (Pescara), tandis que dans une position plus en retrait se dressaient Ortona et Histonium

(Vasto); en outre, de petits agrégats d'habitations étaient disposés le long du passage des principaux fleuves.

Au Moyen-Age, la présence de plaines marécageuses et infestées par le paludisme, en relation à la typologie même de côte basse et sablonneuse, à laquelle s'ajoutait le danger lié à la diffusion de la piraterie dans l'Adriatique, poussa encore plus la population à éviter le littoral et à rester de façon stable retranchée dans ce système de bourgs défensifs qui constituera la trame des futurs "villages". Derrière la zone côtière malsaine se profilait ainsi un paysage de collines homogène, fondé sur quelques centres importants (Teramo, Chieti, Atri, Penne et Lanciano) qui instaurent des relations radiales avec leurs alentours, constellés d'une grande quantité de "lieux". Une route traversant les collines liait entre elles les villes chefs-lieux de Chieti et de Teramo, et, au delà de la région, Ascoli Piceno et Foggia; la viabilité restante était confiée aux voies de la transhumance, à savoir les "tratturi". Cette disposition du territoire, expression de la civilisation italienne la plus typique, présentait au centre de son économie l'agriculture, en mesure d'englober la réalité urbaine, et garantissant des conditions d'équilibre entre milieu rural et milieu urbain.

Ce tableau se maintiendra inchangé jusqu'au XVII<sup>e</sup> siècle, au moment où l'éversion de la féodalité et le rythme de croissance exceptionnel de la population, entre la fin du XVIII<sup>e</sup> et le début du XIX<sup>e</sup> siècle, produiront des transformations essentielles sur le système territorial. La forte réduction de la transhumance, à la suite de la mise en culture de la plus grande partie des terres du Tavolière (Pouilles), diminuera l'importance des "tratturi", et comportera en même temps la dégradation globale de la viabilité routière: ce qui ne manquera pas de se refléter sur le territoire avec une forte tendance à l'isolement des centres, qui ne maintiendront des relations qu'avec les alentours immédiats. On assistera donc à l'apparition d'un habitat éparpillé en fonction d'une nouvelle organisation de la production agricole autour d'une petite ferme, qui rendra bientôt avantageuse l'installation du cultivateur sur son fonds. Ainsi commencera la construction d'habitations disséminées dans la campagne qui, de nos jours encore, malgré un changement de destination fonctionnelle, parsèment le paysage de ces collines.

Mais le véritable événement de portée révolutionnaire a été constitué par la construction de la voie ferrée littorale qui a vu en 1863 l'inauguration de la ligne Ancona-Pescara-Foggia. Un événement capable de transformer radicalement l'espace géographique côtier sur la base d'un projet social qui visait à affronter le grave retard de l'Italie méridionale, en assurant une plus grande accessibilité des zones marginales par un renforcement des voies de communication. Outre la construction de la voie ferrée adriatique, le Gouvernement Central se donna en effet l'objectif de réaliser des infrastructures en mesure de relier le versant tyrrhénien au versant adriatique: la Pescara-Sulmona-Avezzano-Roma fut inaugurée en 1873, et plus que tout autre chose, elle eut le mérite d'attribuer à Pescara le rôle de noeud de trafic avec fonction de confluence et de transmission. L'impact territorial des voies de communication fut déterminant en tant qu'inducteur de la crois-

sance urbaine et industrielle et, initialement, en tant que créateur de projets de développement. La bonification du littoral, qui rendit possible, entre autre, la reconquête des quelques terrains fertiles à l'agriculture, à ce processus de revalorisation démographique et économique permit aux Abruzzes de sortir du pénible isolement où ils se débattaient toujours. L'ouverture vers le Nord et vers Rome réveilla la pratique des cultures des terrains, favorisant le passage d'une économie de subsistance à une économie d'exportation, et allant même jusqu' à donner l'illusion que la "renaissance" économique des Abruzzes pouvait être basée sur l'agriculture. La possibilité d'exporter, grâce au chemin de fer, les produits agricoles périssables provoqua une augmentation des surfaces cultivables, au prix toutefois d'intenses déboisements et d'une extrême fragmentation de la propriété paysanne, avec des formes d'exploitation directe à très basse rentabilité.

Tout évoluait ainsi spontanément, en déterminant de fait un paysage réglé par le binôme voie ferrée-agriculture, tandis que l'industrie naissante, caractérisée par des localisations ponctuelles dues aux vocations des lieux et à des capacités d'entrepreneur fortuites, ne s'était pas encore imposée comme élément modificateur du paysage.

La politique après l'unification de l'Italie, alimentée par des flux économiques de nature internationale à la recherche d'investissements, n'intéressa que partiellement les Abruzzes, et en particulier la vallée du fleuve Pescara qui, par sa structure physique et par son degré d'occupation par les hommes, représenta l'unique bassin en mesure d'accueillir les premières implantations industrielles. Parmi celles-ci, les installations chimiques et les usines de la Montecatini, entre Piano d'Orta et Bussi sul Tirino, une centrale hydro-électrique et, localisées à Pescara, la cimenterie Adriatique, les Industries Pharmaceutiques Bucco, les Fonderies Camplone, la fabrique de couleurs C.I.B.O. (Colorificio Italiano Blu Oltremare) et la fabrique de pâtes alimentaires Delfino.

Entre temps, la voie ferrée adriatique, soutenue par la route nationale et par l'aménagement de quelques routes qui parcouraient les vallées de pénétration, consolidait les premiers habitats littoraux, attirant les populations des collines et des montagnes: ce processus marqua la première phase de centralisation de la zone côtière, confirmée plus tard par des activités productives valables en soi, en mesure de consolider ce processus d'urbanisation fondé sur des pôles centraux susceptibles de tracer des "sentiers de développement".

Construite à proximité de la mer, pour éviter aussi bien la réalisation de coûteuses infrastructures que les retards qu'exigeaient la percée des montagnes nécessaire à la construction de tunnels et de viaducs, la voie ferrée réorganisa radicalement le paysage côtier, proposant comme nouveau centre d'intérêt territorial la gare qui représenta le premier noyau propulsif anticipateur de la grande transformation urbaniste. Elle offrait en effet la possibilité de s'approvisionner en eau potable, mais elle consentait surtout d'effectuer des échanges plus amples et plus commodes; bientôt, outre les habitations du personnel ferroviaire, se dressèrent aussi dans ses alentours immédiats, les premiers habitats artisanaux et commerciaux.

C'est là l'origine des "marines", nées en tant que gemmations des "villages" de l'intérieur et d'autres centres qui se sont créés à partir de rien; "marines" devenues protagonistes d'un développement autonome, essentiellement économique, non lié à la nécessité d'expansion des centres de colline. Une dense succession de centres s'est ainsi réalisée le long de la côte, en mesure d'exprimer une force de pénétration vers l'intérieur, capable de franchir la barrière de l'isolement qui caractérisait la ville historique, et mettant en évidence un certain "dynamisme" renforcé par le développement surprenant du tourisme balnéaire. Au début cependant, il s'instaurera entre les centres "dédoublés" une certaine connexion, qui s'affaiblira toujours davantage jusqu'au lendemain de la II<sup>e</sup> guerre mondiale, au moment où les "marines", fortes de l'autonomie économique obtenue, commenceront à faire prévaloir leur importance sur le centre d'origine.

Ainsi se désagrègera ce cadre territorial caractérisé par une image homogène: la population tendra à se concentrer en renforçant une structure urbaine hiérarchisée qui signifiera dicotomie entre ville et campagne et, donc entre côte et arrière-pays, amorçant ce développement littoral qui mènera à la réalisation d'un habitat longitudinal continu.

Cependant, entre Pescara et Chieti Scalo, un système fondamentalement conurbatif, caractérisé par un remarquable dynamisme industriel et un fort développement des activités tertiaires, se renforçait toujours davantage. Ce système s'intensifiera et se consolidera durant les années 70, intéressant toutes les communes limitrophes de Pescara, tant par des effets d'imitation que de distribution. Le développement monocentrique de Pescara, constituée chef-lieu de province en 1927 seulement, considéré initialement comme un facteur de déséquilibre pour le territoire, se révélera au contraire déterminant pour la diffusion des activités et des services capables de consolider les modalités de croissance préexistantes, liées à la présence des voies de communication et des axes des vallées.

La construction du réseau autoroutier consolidera au cours de ces années, l'affirmation territoriale du facteur industrie, ouvrant la voie à une vision plus articulée de la réalité économique nationale et internationale.

Après la II<sup>e</sup> guerre mondiale, la politique pour la valorisation du Mezzogiorno (le Sud de l'Italie) s'orienta vers l'industrialisation par pôles et zones de développement intervenant dans les Abruzzes avec la création, dès le début des années 60, de sept zones et noyaux d'industrialisation. C'est précisément l'industrie qui va représenter l'autre élément modificateur du paysage qui vient après les voies de communication, capable de réaliser une "sélection zonale" dictée par la vitalité économique du territoire et reproduisant en tout cas cette trame de l'habitat, marquée par la spontanéité et fondée sur une "accessibilité plus grande et plus facile". En effet, la dynamique démographique différente, qui avait plasmé durant les années précédentes la zone côtière septentrionale par rapport à la côte méridionale, va se doubler d'une dynamique productive. Au Nord, la province de Teramo, qui avait déjà connu une intense valorisation résidentielle et touristique, et qui avait vu la réalisation sur son territoire d'un "continuum urbanisé" de

l'embouchure du Tronto jusqu' à Pescara, réussira à proposer un modèle de développement économique endogène, animé d'une remarquable poussée à la diffusion, et capable d'intégrer industrie et habitat à travers des choix de localisations précis; partant de la côte et utilisant les parcours des vallées de pénétrations, ce modèle s'imposera dans l'arrière-pays. Au Sud, la province de Chieti, proposera, en ce qui concerne aussi bien le peuplement que les activités productives, une organisation territoriale marquée par les effets de la politique méridionaliste: un développement "par tache", dicté par de grandes usines à capital exogène, incapables d'interagir avec le territoire et donc destinées à rester des épisodes isolés.

L'écart historique entre Abruzzes intérieurs et Abruzzes côtiers va ainsi se doubler d'un écart entre zone côtière septentrionale et zone côtière méridionale, et ceci en parfait accord avec la pensée géographique qui considère les Abruzzes Adriatiques comme une région à mi-chemin entre Tierce Italie et Italie Méridionale. Point de soudure entre ces deux réalités différentes, le noeud de Pescara, depuis toujours caractérisé par un fort développement capable d'irradier sur le territoire et de se refléter avec une puissance d'expansion diversifiée.

Cette trame de base a continué à imprégner le paysage côtier au cours des années 70 et 80, confirmant d'un côté le nouveau processus dicotomique, même s'il s'est manifesté d'une manière plus nuancée, et de l'autre proposant de nouveaux cadres de développement fondés sur des secteurs économiques également nouveaux.

Les années 70 ont renforcé le modèle adriatique d'industrialisation diffuse, à forte croissance autonome, typique de la province de Teramo; ces années ont aussi confirmé le développement dépendant de la province de Chieti et ont fait ressortir la forte urbanisation et l'apparente dé-industrialisation de la zone Pescara-Chieti.

Le développement plus récent a contribué ultérieurement à soustraire le paysage côtier à la dynamique caractéristique de la mer, et à le projeter dans l'arrière-pays à travers un processus de revalorisation de la zone de collines; processus qui est la conséquence des nouveaux rapports qui se sont instaurés entre la ville et la campagne et qui a annoncé une redécouverte du paysage agricole qui va se traduire, dans les années 80 surtout, par le dynamisme d'un secteur toujours plus rationnel (cultures forcées de primeurs, légumes en serre), soutenu par l'augmentation même de la population urbaine et par le développement du tourisme d'été . L'agriculture rythme donc le paysage et, comme si elle voulait combler le vide laissé par l'industrie, elle s'impose de façon plus nette dans la province de Chieti avec une typologie de l'habitat isolé, confirmant ainsi une plus grande "ruralité" qui domine le territoire.

Les années 80, caractérisées par un cadre économique et politique projeté dans le décor d'une Europe Communautaire, et marquées par une période de récession, semblent avoir suggéré de nouvelles voies de développement, capable de modifier les équilibres territoriaux préexistants sur la base d'une plus grande compétitivité et selectivité qui, inévitablement, s'imposent comme une conséquence de la concurrence entre les aires de production.

La zone adriatique des Abruzzes a donné une réponse positive à ces nouveaux signaux, perpétuant un dynamisme qui s'exprime par un enrichissement et une diversification de sa structure productive; ce qui a donné naissance à de nouvelles entreprises dans les secteurs à moyenne et haute technologie, et surtout dans le secteur tertiaire. La zone côtière a été en effet intéressée par un processus de passage au secteur tertiaire qui s'est imposé, tout en suivant la structure urbaine, comme un tertiaire "non traditionnel", en mesure d'exercer une véritable fonction motrice dans un système d'interconnexions avec le secteur industriel; la croissance des services aux entreprises devient ainsi, grâce à leur fonction stratégique et innovatrice, un instrument de survie pour les petites et moyennes entreprises.

Continuité et innovation marquent le territoire: les zones à croissance consolidée se confirment avec un renforcement des modèles de développement local dans la zone côtière septentrionale, tandis que sur la côte méridionale l'insuffisante connexion avec le territoire représente un nouvel échec de la politique méridionaliste. L'absence d'économies externes pousse les quelques initiatives industrielles à caractère endogène, exceptionnelles dans cette partie des Abruzzes, à se situer aux alentours des zones urbaines, bien équipées, ou carrément à disparaître. Ce sont ainsi les communes côtières qui accueillent ce processus, assez nouveau pour la province de Chieti, provoquant une nouvelle émargination des zones internes, ce que confirme leur baisse démographique.

Les équilibres territoriaux préexistants peuvent être "stimulés" et modifiés précisément à travers le canal du tertiaire, tant en termes de potentialité du développement industriel que de requalification du capital humain: il est important, donc, de sortir du monde rural, surtout en tant que formation socio-culturelle.

Il faut pour conclure souligner certainement le rôle prioritaire qu'a joué le tourisme balnéaire dans la modification du paysage côtier, en représentant le point de départ d'une croissance souhaitée déjà avant la II<sup>e</sup> guerre mondiale. Ce n'est qu'à partir des années 60 que le tourisme s'affirmera en tant que facteur capable d'interagir de façon active avec le territoire, mais son action sera déterminante plus au niveau de l'urbanisation que du peuplement permanent. En effet, la disponibilité de terrains à bâtir et morphologiquement propices au développement d'infrastructures justifiera, comme nous l'avons dit, l'expansion continue des centres côtiers selon un habitat qui, ponctuel au départ, se présentera toujours plus linéaire.

La "demande" de la côte dans un but balnéaire représente sans doute la seule forme de "projection maritime" qu'exprime la région, étant donné son manque persistant de vocation portuaire. La création du port touristique "Marina di Pescara" et le choix de Ortona comme port régional peuvent certainement contribuer à rapprocher la zone côtière de l'arrière-pays immédiat, pour récupérer cette position géographique de centralité que les événements historiques, et les limites imposées à l'organisation humaine du territoire, n'ont jusqu'à présent pas permis de valoriser pleinement.

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## EDUCATION OF POPULATION AS A FACTOR OF RURAL DEVELOPMENT

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**Abstract.** The purpose of the present report is to characterize the spatial differentiation of the education levels among private farmers in Poland in 1988, and to show the change in the education structure of agricultural population in the period 1978–1988. Education of agricultural population is presented as one of the most important factors determining the agricultural, and more generally, rural transformations within the process of overall economic transition to market circumstances.

**Key words:** education, agricultural population, rural development, structural transformation.

Agriculture, similarly as the whole of Polish economy, undergoes currently the period of structural and organizational changes related to systemic transformations. Transition to market economy requires, first of all, transformation of the system of management, financial reforms and organization of the market.

Agriculture in Poland, compared to other post-socialist countries, has a similar ownership structure of farms as the Western European countries, and — at least because of just that — has a high potential for rapid adaptation to the general level of Western agricultures. In order to face the challenge of competition from Western producers, however, Polish farmers must modernize their farms to make them more efficient. Professional skills and marketing abilities will be rewarded under the new conditions.

Free market gives, on the one hand, equal opportunities to agricultural producers, but, on the other hand, renders the weak farmers for ruthless selection. Demanding rules of market economy will force some farmers to abandon further productive activity, constituting presently their basic or significant source of income. The remaining on the land farmers will be the educated ones and adequately prepared for their occupation, the entrepreneur-oriented ones and well acquainted with the realities of market economy. Agriculture will be abandoned by a part of people, those looking for some other occupation, e.g. in services (trade, catering), but remaining in the countryside. Some people will stay in agriculture, treating it as a source of partial income, with other sources of maintainance being outside of agriculture, like tourism or crafts.

Structural transformations encompassing the whole of economy caused a decrease in employment in the public firms, entailing the increase in unemployment, also among the people living in a countryside and commuting to work. They face the question: what next? how to complement their incomes, what kind of activity to undertake?

The purpose of this short report is to characterize the level of education of farmers, being one of most significant features influencing the course of changes in the whole agricultural sector, especially at the present stage of transformations in national economy.

The report is based upon the data from the national census of 1988, concerning 5 levels of education of private farmers in Poland on the scale of communes (gminas) and provinces (voivodships).

Out of the total population of Polish rural areas in 1988 amounting to 14.7 million, 4.6 million were employed in agriculture, of whom 2.8 million (60.9%) were persons working mainly on their own farm. For this population group, the main source of income was the work on the farm, and it is this group that was the subject of detailed analysis.

Improvements in the educational system caused a significant advance in the education level of agricultural population, and its still increasing professional skills. Simultaneously, due to ageing, a part of older farmers stopped working, included those with lower general education and lack of professional training.

In comparison with 1978 there was in 1988 an important increase of the share of farmers with education higher than primary school and a significant drop of the share of farmers with less than complete primary education.

The education level of rural population is still lower than that of urban population. The average national share of population with education higher than primary\* in 1988 was 64.6% for towns and 39.2% for countryside, while the same indicators in 1978 were 53.0% and 25.9%, respectively. The rate of growth of number of persons with education higher than primary was in the last decade much higher in the countryside than in towns.

The analysis of changes in the education level of professionally active rural population indicated that in 1988 the share of persons with education higher than primary in this group exceeded 40% in the most of territory of Poland, while in Poznań and Katowice voivodships it exceeded 60%. In comparison with 1978 the extension of the areas where the shares of professionally active persons with more than primary education was noticed to include first of all the areas located in the North, North-West and South of Poland, where in 1978 the shares were at 30–40%, while in 1988 they exceeded 40%.

The lower level of education of rural population linked with private farming was to a large extent caused by the much older age structure of persons working in agriculture than outside of it.

In 1988 in Poland among the persons working mainly on own farm there were 28.1% of those with more than primary education, including 0.5% with

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\* Including: university, secondary school and vocational training.

university education, 7.6% with secondary education and 20.0% with vocational education. Farmers with primary education dominated (60.2%). There were a bit less than 12% of farmers with incomplete primary education (Table 1).

Table 1. Rural population of 15 and more years of age, linked with private agriculture, according to education level and the nature of employment on the farm

Population categories	Education							
	University		Secondary		Vocational		Primary	Incomplete primary and no education
	Total	Agricultural	Total	Agricultural	Total	Agricultural		
Total considered in that number:	1.2	0.3	11.1	2.5	22.8	4.9	52.3	12.6
employed mainly on own farm	0.5	0.3	7.6	3.0	20.0	8.6	60.2	11.7
employed additionally on the farm, with main income from:								
job outside of the farm	2.9	0.6	20.6	3.9	37.5	3.6	37.0	2.0
old age pensions etc.	0.8	0.1	4.6	0.7	7.3	1.0	61.4	25.9

Source: Ludność i mieszkania. Zarys przemian w latach 1979–1988. Polska. Narodowy Spis Powszechny, GUS, Warszawa 1990.

The education levels of the group of persons who treated working on own farm as an additional job were, on the other hand, quite different. Within this group, and especially among persons having main source of income from a job outside of own farm, there were significantly more persons with university (2.9%), secondary (20.6%) and vocational (37.5%) education. There were less persons with primary education (37.0%) and a very low share of those with incomplete primary education (2.0%). The least advantageous structure of education was characterizing the group of persons, working additionally in agriculture, whose main source of income was of the retirement pay or old-age pension type. Here, persons with primary (61.4%) and incomplete primary (25.9%) education dominated decisively.

Education levels of private farmers in Poland are displaying high spatial differentiation (Fig. 1).

The areas of Greater Poland, Cuiavia, Krajeńskie and Chełmińskie Lakelands, as well as Lower Vistula are characterized by the highest levels of education of farmers (the highest shares of persons with more than primary education). This especially applies to Greater Poland, where in the communes of Poznań and Leszno voivodships the shares of farmers with more than primary education exceeded 40%, and in almost every second commune it even exceeded 50% of persons working primarily on own farms (Gałczyńska 1993a).

Similarly high share of population with more than primary education characterized the communes of the western, northern and southern part of

the suburban zone of Warsaw, and a part of communes in Lower Silesia and the Sudetian submontane region.

It should be emphasized that there is quite a high, namely 30–40%, share of agricultural population with more than primary education, on the majority of areas of western and south-western Poland, and over a large part of the northern part of Poland, and especially in the vicinity of Kętrzyn, Olsztyn, Ostróda, as well as Mława and Maków Mazowiecki. Similarly, in the communes located in the southern part of Poland in the areas around Cracow, Miechów and Sandomierz, and also in the East, in the vicinity of Lublin and Puławy, the share mentioned was quite high, often exceeding 40%.

A high share of agricultural population with more than primary education was observed, as well, in the communes located in the vicinity of large towns, this fact resulting from concentration of schools of various types, including agricultural ones, in large urban centers, and also from the fact that running the farms specializing in fruit, vegetable and flower production requires much higher skills.

The share of farmers with more than primary education was distinctly the lowest — below 20% — mainly in the communes located in the north-eastern part of Poland, but also in the central part of the country within the border region of Piotrków, Kielce and Radom voivodships, and in some areas of south-eastern Poland. In several cases the considered share there did not exceed 15%.

The share of agricultural population with more than primary education was first of all determined by the number of persons with vocational education and, to a somewhat lower degree, by persons with secondary education. This regularity was characteristic for the majority of communes in Poland, both for those with high and for those with low share of farmers with more than primary education.

Within the areas where the share of agricultural population with more than primary education was high, i.e. exceeding 40%, farmers with vocational training constituted 30–40%, while those with secondary education 10–15%.

Then, in the areas where these shares were low, i.e. below 20%, farmers with vocational education constituted 10–15%, and those with secondary education — rarely more than 5%.

A different structure of education higher than primary was observed among farmers in some communes of the suburban zone of Warsaw. In this area the high shares of farmers with vocational education (15–20%) were often accompanied by high shares of farmers with secondary education (20–30%). The shares of farmers with university education was in these communes high as well (3–7%).

The structure of education of farmers was yet different in the communes of Leszno voivodship. Within the areas where the shares of farmers with more than primary education were high, i.e. exceeding 40%, farmers with vocational training clearly dominated (30–50%), while the shares of those with secondary education were lower (5–12%) than in other areas. A similar structure characterized the farming population of Kalisz voivodship.

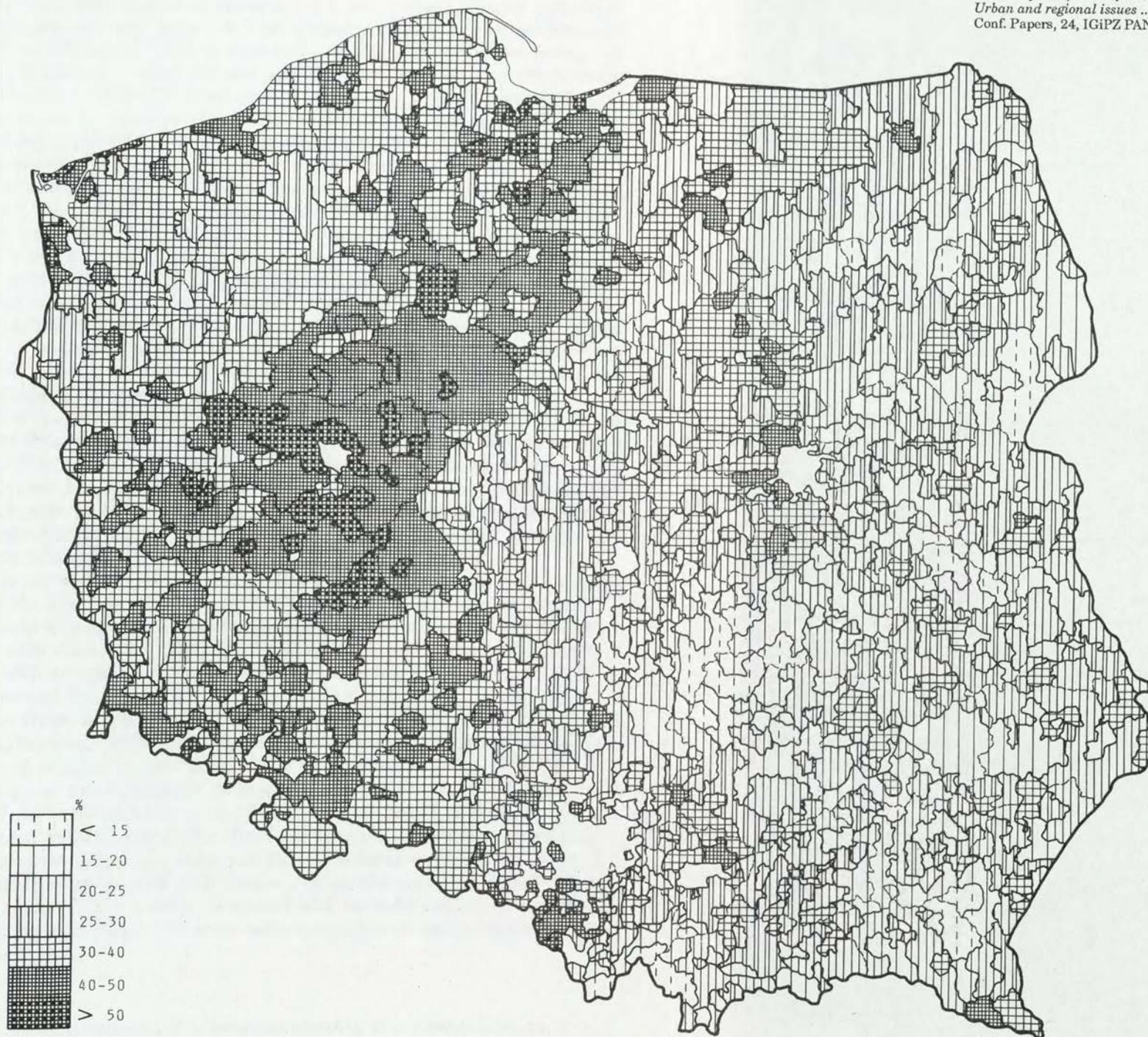


Fig. 1. The share of agricultural population with more than primary education in the total number of actively employed mainly on own farm. Private farming, 1988

Areas with high shares of farmers with more than primary education do largely overlap with areas of high shares of farmers with professional agricultural education. This is especially visible within the outer edge of Greater Poland, in Leszno, Poznań and Kalisz voivodships, where farmers with professional agricultural education constituted 20% and even 30%, and there were some communes in which this share exceeded 40%. This phenomenon explains to a large extent the high effectiveness of agricultural economy within these areas. The close relation between the education level and the production effects of farmers is confirmed by the numerous analyses carried out by economists and geographers (Gałczyńska, Kulikowski 1985).

There are areas, however, where the share of farmers with more than primary education was quite significant, exceeding 20%, while the share of farmers with professional agricultural education constituted less than 10%. This concerns, in particular, the areas located in the southern and south-eastern part of the country. This fact is related to existence of an important number of bi-occupational farms within these areas. Farmers conducting such farms possess, as a rule, professional skills enabling them to undertake a job outside of agriculture and they often in fact perform such work.

Then, on the other hand, within the areas with the lowest shares of farmers with more than primary education (10–15%), in a majority of communes there were less than 5% of farmers with professional agricultural education.

The lowest level of education characterized farmers from north-eastern and south-eastern parts of Poland, and also from some communes located in the central part of the country. Within these areas up to 20%, and sporadically even 30% of farmers have not finished the primary school.

The areas with the lowest education levels among farmers correspond to the areas with the highest share of farmers in post-productive age.

It should also be emphasized that within the areas where the shares of farmers with more than primary education were the highest, the shares of farmers with incomplete primary education were insignificant, and it usually did not exceed 3%.

The analysis of changes in the education structure of private farmers in Poland in the years 1978–1988 on the voivodship scale confirmed the positive direction of changes in education levels (Gałczyńska 1993b), (Fig. 2).

In place of the structures of population education of the simple type,  $P_3B_3$  or  $P_4B_2^{**}$ , characterizing in 1978 significant areas of Western, central and Eastern Poland, where the shares of farmers with incomplete primary education were quite high, more complex structures appeared, in which the increased share of farmers with primary education was accompanied by the growing shares of those with vocational and secondary education or by significantly lowered share of farmers with incomplete primary education ( $P_4Z_2$ ,  $P_4Z_1S_1$  or  $P_4B_1Z_1$ ).

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\*\* S — secondary education, Z — vocational education, P — primary education, B — incomplete primary education.

This is the effect of the constant inflow to agriculture of the younger people, and especially of persons with secondary and vocational education, and the effect of further training of persons already working in agriculture. An important influence was also exerted by the previously mentioned process retiring of elder and less educated persons.

It can be assumed with high probability that the areas with the highest shares of educated farmers, both in terms of general and professional knowledge, are exactly the areas where agriculture has the chances of further development. This applies, in particular, to the areas of important traditions of good agricultural economy (like Greater Poland) and where many of the already existing farms are doing well in the new economic conditions and represent a level compatible with European standards. It is just there, near to Poznań, that the first agricultural-horticultural exchange was established, modelled after Western patterns.

Certainly, some farmers, and especially those who possess also other skills besides the agricultural, will start non-agricultural activities in their place of residence. Examples of such activities are found in practice. Sample studies undertaken in the suburban zone of Warsaw in the commune of Jabłonna (Kulikowski, Gałczyńska 1993), specializing in flower production, demonstrated that a part of farmers, in view of high costs of greenhouse production and the difficulties with selling of flowers either gave up their production and undertook to organize service activities and to invest there-in (a club, restaurant, catering house), or rented out the greenhouses for wholesale establishments, garages, etc.

Undertaking of non-agricultural activity by farmers or members of their families through establishment of the trade-and-service activities was also shown in the study conducted in Gorzów voivodship in Myślibórz commune. Such an activity is being mainly undertaken by young people having some non-agricultural professional training as well (Okuniewski 1993). These activities, however, are not undertaken on a broader scale.

Within the areas having some recreational value one observes the increasing number of examples of undertaking the service activity by farmers. Bed-and-breakfast and organization of recreation constitute important additional sources of income for them, allowing employment for other members of family, as altogether confirmed by the studies conducted in Polish Carpathian Region (Górz 1990).

There is a financial barrier, which makes start of production activity difficult. The credit price is still so high that the realization of investment endeavours must to a high degree be based upon own financial resources. Therefore, investment in processing of agricultural products, requiring important financial outlays, are rare.

The situation is much more complicated over the areas where less educated farmers are engaged in agriculture. Here, the state intervention is more needed in terms of tax reliefs, schooling, marketing or advising, encouraging farmers either to change the structure and orientation of agricultural production, or to undertake a more profitable and productive work outside agriculture. The changes, however, will proceed slowly.

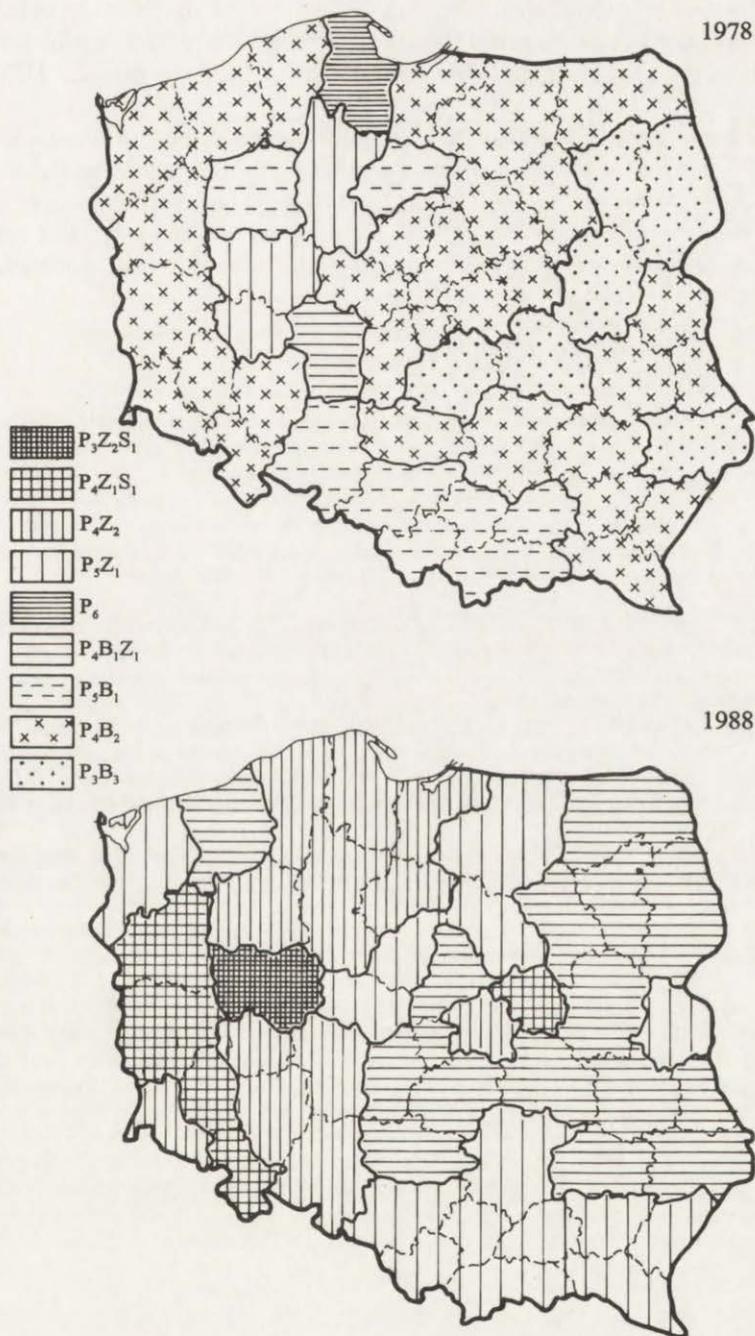


Fig. 2. Leading education structure of population employed mainly on own farm in the years 1978–1988

S — secondary education, Z — vocational education, P — primary education,  
 B — incomplete primary education

There are increasing in number options about the necessity of establishing a governmental agency supporting local initiatives, which could be helpful for the development of agriculture and for rural areas in general (Kłodziński 1993).

The educational system also slowly adapts itself to the needs of market economy. A reform of the professional schooling is under preparation. Thanks to this reform young people will be trained in a more flexible manner enabling them to take up jobs both in agriculture and outside it under the conditions of market economy, creating thereby possibilities for the multifunctional development of rural areas.

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## DEPRESSED AREAS IN POLISH PRIVATE FARMING

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**Abstract.** The paper presents the concept of so called depressed areas in Polish private farming. Seven depressed areas have been distinguished and described by the eight diagnostic features presented negative phenomena in social, technical and production spheres of agriculture.

**Key words:** Polish private farming, problem areas, depressed areas.

The concept of "problem areas" is one component of the methods for solving complex issues in spatial planning on the meso- and macro-scale.

On the basis of opinions concerning problem areas, as presented in the literature (Falkowski 1990), where the same notion is also referred to such terms as conflict areas (Grocholska 1982), multiple problem areas (Zagożdżon 1988), shortage or poverty zones (Frąckiewicz 1983), as well as opportunity areas (Kulikowski 1989), two fundamental categories of such areas can be distinguished. The first category encompasses the so called "depressed areas", which feature developmental lag in comparison with other, surrounding territories of similar natural and economic conditions for production. These areas, therefore, being parts of regions or countries, display negative phenomena in the social, economic or technical spheres, causing in turn definite internal anomalies. The second category of problem areas contains the ones which are characterized by concentration of numerous functions (like agriculture, settlement, industry, transport etc.), while the development of one of these functions takes often place at the expense of the others.

The statistical basis of the present report is constituted by the data encompassing quantitative characteristics of all the more important features of private farming for the year 1988 on the scale of communes (the lowest administrative divisions of the country) over the whole of Poland, as well as data concerning commercial and global product of agriculture for the year 1990.

The purpose of this report is to establish delimitation and characterization of the problem areas of agriculture, belonging to the first of the above mentioned categories, i.e. to the category of depressed areas. Identification of these areas was carried out on the basis of the diagnostic features characterizing negative phenomena from such spheres as: social and ownership relations, organization and technology, and finally agricultural production. The negative phenomena were identified as situations where a given feature would attain its all-country low value within an area.

The basis for delimitation of the depressed areas in private farming was in this study constituted on the following diagnostic features, defined explicitly for purposes of qualification of communes belonging to the depressed areas:

1. The share of farms 0.5 to 5.0 hectares, exceeding 30% of total area of private farms.

2. Low level of professional training among farmers, as measured by the appropriately high share of population having not completed primary education,

3. Low reserves of labour force in agriculture, as indicated by the lowest density of persons actively employed in agriculture in the whole country.

4. Negative age structure of employed in agriculture, indicated by the high shares of agriculturally active population of more than 60 years of age, working on own farms.

5. Low level of mineral fertilizers use — less than 120 kg of NPK content per 1 hectare of agricultural land.

6. Low level of mechanization of agriculture — less than 150 HP per 100 hectares of agricultural land.

7. Low level of commercialization of agriculture, as indicated by the national low value of saleable produce of agriculture per 1 hectare of agricultural land.

8. Low level of specialization of agriculture — defined on the basis of the indicator elaborated by the present author.

The cartographic image of the depressed areas in agriculture in Poland (Fig. 1) has been obtained in such a manner that the above mentioned 8 diagnostic qualifying features received assigned respective symbols, and then, depending upon the concentration (number) of symbols the communes on the map were more or less intensively hachured. The map attached to this report presents as depressed areas these communes where at least three out of eight diagnostic features represented the respective qualifying level.

In the light of the diagnostic features accounted for there are some 670 communes in Poland which do not display the qualifying levels of these features, which may be understood as indicating that agriculture in these communes develops in a relatively harmonious manner. This concerns almost 1/3 of Polish territory. Thus defined “no-problem” communes concentrate within the regions of Greater Poland, Silesian Lowland, lower Vistula valley, and middle Vistula valley — in the vicinity of Toruń, Płock and Włocławek. A significant number of such communes are also located in the voivodships belonging to the belt stretching along the western boundary of Poland, separating us from Germany. A somewhat smaller clusters of these communes can be found on the Lublin Plateau, in the vicinity of Lublin itself and of Zamość, as well as in the horticultural areas of Radom voivodship.

The areas with one or more qualifying diagnostic features corresponding to weaknesses of agriculture encompassed primarily eastern Poland, and especially its north-eastern areas, as well as the plateaus, valleys and mountains in the South.

On the basis of concentration of the diagnostic features in particular

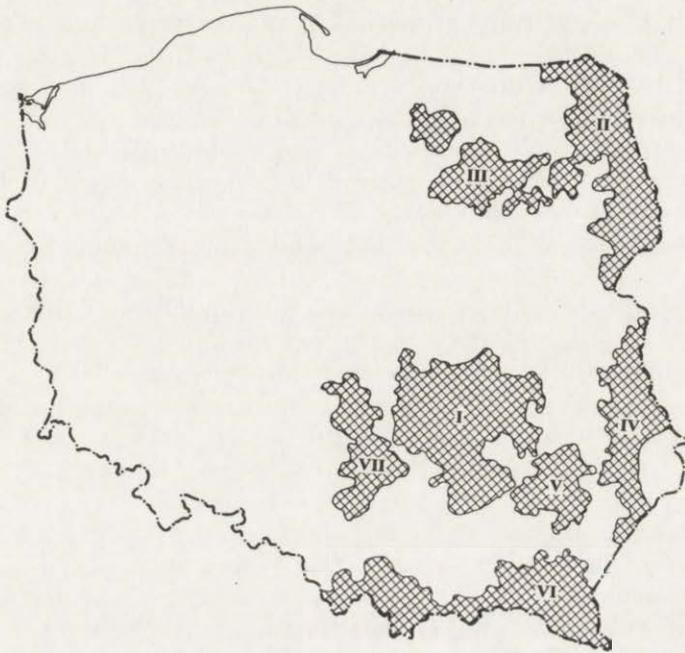


Fig. 1. Depressed areas of Polish individual agriculture

Areas of: I — Kielce–Radom–Piotrków, II — Suwałki–Białystok, III — Kurpie, IV — Włodawa–Zamość–Lubaczów, V — Sandomierz Basin, VI — Carpathian Mts, VII — Cracow–Częstochowa

communes within the country the following depressed areas can be distinguished:

I. Kielce–Radom–Piotrków area, including large stretches of land in respective three voivodships. This area is characterized by very strong domination of private farming, occupying there more than 90% of total agricultural land. This area is not only very extensive, but also it displays the highest — in the country — concentration of the qualifying diagnostic features. Out of eight features accounted for, numerous communes of the area display qualifying levels in cases: 4, 5, and even 6 or 7 of them. Thus, the area considered is characterized by the excessively low acreage of farms, low level of professional training of farmers, and disadvantageous age structure of people working in farming. Besides this, the area has the lowest material inputs into agricultural production in the whole country, this situation being represented here by the very low intensity of mineral fertilization and mechanization of agriculture.

In the decisive majority of communes of the Kielce–Radom–Piotrków area there were less than 150 HP per 100 hectares of agricultural land, and within an important part of this area even less than 100 HP. Simultaneously, in the areas of Greater Poland and Lower Silesia the same indicator would attain 300–400, and even above 400 HP per 100 hectares of agricultural land. The area considered displays also the lowest agricultural production

effects per units of agricultural land on the scale of the country, as well as the lowest level of agricultural specialization. The magnitude of commercial production per agricultural area unit was here three or even four times lower than attained in private farming of Greater Poland, Lower Silesia, Western Pomerania or the suburban zone of Warsaw.

Thus, we are dealing here with a typical multiple problem depressed area. The reasons of its appearance seem to be quite complex. Let us cite first of all poor natural conditions. The share of good and very good soils is here among the lowest in the country. An important difficulty for agricultural cultivation is constituted also by the very differentiated surface relief, especially within the Holy Mountains range. Low qualities of the agricultural production space is, in particular, the reason why the rural population of this area, who can find employment outside agriculture, attains higher incomes from the other jobs, while neglecting work on own farms. This, in turn, is one of the causes of the low productivity indicators of agriculture in this area, one of the lowest in the country, both per unit area of agricultural land and per one person employed in agriculture.

The shortages as to the social and technical infrastructure in the countryside contribute to excessively intensive depopulation of villages within the area considered.

II. Suwałki–Białystok area encompasses almost all of the two respective voivodships, although higher concentration of qualifying features for depressed areas occurs in the eastern parts of the two voivodships. Opposite from the previously considered Kielce–Radom–Piotrków area, the one now analyzed features much better farm acreage structure. In numerous communes of this area the average farm surface exceeds 10 hectares, while the share of farms of up to 2 hectares in the total agricultural land owned by the private sector is marginal and in the majority of communes it is lower than 2%.

The area in question is characterized by low productivity of land, low level of professional training of farmers, low value of inputs into agricultural production, including low relative numbers of tractors and low use of mineral fertilizers. In numerous communes of Suwałki–Białystok area application of mineral fertilizers was in 1988 below 100 kg of NPK content per 1 hectare of agricultural land.

In spite of the above mentioned (relatively) high average farm area in the private farming sector within the land considered the degree of commercialization of production, and especially the level of commercial output per 1 hectare of agricultural land was here quite low. The area constitutes a fragment of the so called “eastern wall”, characterized by the depopulation of rural areas, caused by the inadequacies in the domain of social and technical infrastructure. It is also characterized by a low appreciation of the qualities of agricultural productive space, paralleled by the extensive use of the permanent grasslands, quite common there. Like in the previously considered area, agriculture in Suwałki region encounters also difficulties resulting from the differentiated surface relief, especially within the territories of the post-glacial lakelands.

III. Kurpie area — located over the Kurpie outwash and encompassing the adjacent parts of Ostrołęka, Olsztyn and Łomża voivodships. The area overlaps to a large extent with the traditional region of Kurpie, featuring important forest cover and vast surfaces of meadows and pastures. Due to the fact that not fertile podzolic soils dominate here, with the peaty and boggy soils prevailing in the valleys, the value of the general indicator of quality of the agricultural productive space is one of the lowest in the country. The value of this indicator ranges from some 37–40 points in the communes of Turośl, Łyse and Zbójna, to 40–45 points in the remaining part of this area (while the average for Poland is 66.6 points).

Private farming dominates decisively in the land property structure, since it takes almost 100% of agricultural land. Average surfaces of private farms are among the biggest in the country, ranging often from some 10 hectares to 14 hectares in particular communes.

This area is characterized by the advantageous — in comparison with other parts of the country — age structure of population employed in agriculture. In 1986 the percentage share of this population of 60 and more years of age did not exceed 15% in majority of communes. There was, on the other hand, a high share of population with unfinished primary education. A very disadvantageous feature of this area is constituted by the excessively high masculinization indicator. The number of women in the age of 20–24 years per 100 men in the same age bracket is approximately 60. Thus, there is an acute shortage of wife candidates for young farmers.

Agriculture of this area is one of the worst, poorly equipped in draught power in comparison to the whole country. The potential of tractors in horsepower per 100 hectares of agricultural land was in Kurpie 2 to 3 times lower than the national average in 1988, when the latter was at about 280 HP. Similarly low was use of mineral fertilizers in private farming, amounting in 1988 in numerous communes of this area to less than 100 kg of NPK content per 1 hectare of agricultural land.

The area of Kurpie is also characterized by low productivity and low level of commercial production in agriculture and, similarly as the whole of Ostrołęka voivodship in 1986, it featured the lowest land productivity in the country. One of the reasons of the low level of agricultural production in this area is — side by side with poor soils — low intensity of agricultural economy over vast surfaces of permanent grasslands.

IV. Włodawa–Zamość–Lubaczów area, which encompasses the communes located in the eastern parts of Biała Podlaska and Chełm voivodships, in the central part of Zamość voivodship, and in the North part of Przemyśl voivodship, and constitutes a southern extension of the Białystok–Suwałki agricultural depressed the two being referred to jointly as the “eastern wall”. This area has quite differentiated natural conditions for agriculture — weak ones in the vicinity of Lublin Polesie, and much more advantageous in the communes located on Lublin Plateau. Similarly as in all the other previously considered areas, private farming dominated there, though its share in the total agricultural land is differentiated and ranges from 50–70% in some

communes located in the central part of the area, to 70–90, and even than 90%, in the communes located in the eastern part of Lublin Plateau. The area is similarly differentiated as to the acreage structure of private farms. In numerous farms located in the northern part of the area the average surface of farms ranges from 10 to 15 hectares. At the South of the area the average surfaces of farms drop down to 6–7 hectares or even below 5 hectares.

The area is characterized by low level of inputs into agricultural production, both in terms of turnover means and fixed assets. In the majority of communes in the area the mineral fertilizer use in 1988 amounted to less than 120 kg per 1 hectare of agricultural land, and in the central part of the area to even less than 100 kg of NPK content per hectare. The level of mechanization of agriculture was so low, as was the level of professional training of farmers.

The indicators of land productivity and commercial output of agriculture within the area considered is significantly differentiated and quite closely correlated with soil quality. Where soils are poor (northern and central parts of the area) the two indicators attain low values, while in the communes located on Lublin Plateau the values of these indicators are similar to the respective national averages.

V. Area of Sandomierz basin, encompassing almost whole of the geographic region of Sandomierz basin, together with a part of Roztocze hills in the vicinity of Janów Lubelski. This area is characterized by excessive fragmentation of private farms. Their average surfaces range between 2 and 3 hectares, while the share of farms of more than 10 hectares of surface does not exceed in particular communes 5% of total agricultural land. Natural conditions here are disadvantageous for agriculture due to high share of soils of sandy origin.

Quite high numbers of professionally active population working in private farming of the area, 20–30 persons per 100 hectares of agricultural land, are characterized, however, by low levels of professional training.

The use of mineral fertilizers was in this area also very low. In some communes located there this indicator dropped in 1988 to less than 80 kg of NPK content per 1 hectare of agricultural land, and in majority of communes it did not exceed 120 kg. In distinction to the previously described agricultural depressed areas, this one featured a higher level of mechanization, although in the majority of communes the power of tractors per 100 hectares of agricultural land was here lower than the national average (the latter attaining approximately 250 HP per 100 hectares in 1987), and it ranged from 100 to 200 HP. On the other hand, the share of animal traction in the total draught power resources available in agriculture was higher here than in other areas considered.

This particular area is also characterized by high population density in the country-side and by the very high share of bi-occupational (farmer-worker) population, therefore the low commercial production of agriculture and low level of specialization. Agroclimatic conditions in the area, especially thermal, are much more advantageous than in the other areas considered.

VI. Carpathian area encompasses Polish Carpathians and to a large extent

also Carpathian foothills. Over almost all of this area — except Bieszczady Mts — farm acreages are small, with natural and artificial fragmentation (chessboard structure), especially in the southern and eastern communes of Bielsko-Biała voivodship and in Podhale. The Carpathian area is characterized by very strong domination of private farms and it is only in some communes located in Bieszczady Mts that the share of the “socialized” (state and cooperative) farms in ownership of agricultural land attains 40–50%, and even more yet in the communes of Lutowiska and Komańcza. In the population of private farms the dominating share is taken by the farms of 2–5 hectares of area.

Numerous commune of this area are featuring low levels of values of inputs into the technical productive means. In some Carpathian communes the power of tractors per 100 hectares of agricultural land was below 100 HP. There were many communes in which this indicator ranged from 100 to 200 HP, and only few, located in Bielsko-Biała, could be considered to have high indicator (300–400 HP per 100 hectares of agricultural land).

The level of mineral fertilizer use in the private farms belonging to this area was among the lowest in the country. In 1988 this level did not attain even 80 kg of NPK content per 1 hectare in the majority of communes considered. Similarly, as in the previously considered area no.V the share of animal traction in total draught power resources is high here. The natural conditions for cultivation are quite disadvantageous due to qualities of soils, erosion-prone surface relief, and also to the shorter growing season.

VII. Cracow–Częstochowa area largely overlaps with the region of Cracow–Częstochowa Jurassic Rocks range in its southern and middle part, but also encompasses further on to the North a dozen communes in the western part of Piotrków voivodship. This also is the area characterized by the domination and excessive fragmentation of the private farming sector, with a significant share (more than 30%) of people of more than 60 years of age among those employed in agriculture. In the southern part of this area, in particular, the average acreage of private farms is small and ranges from 1 to 3 hectares, while in the remaining communes — from 3 to 5 hectares. Numerous communes of this area are also characterized by an important share of population not having finished primary education among those working on own farms. The Cracow–Częstochowa area did feature low level of mechanization in agriculture, as well.

Bad situation of agriculture in the area there is yet worsened by the high environmental pollution of soils (heavy metals) and of the air, especially in the part of the area belonging to the region of Silesia. Within the northern part of the area, on the other hand, agriculture encounters an important problem of too low level of groundwater, caused by existence of the crater of lowered groundwater due to extraction of lignite from the open — cast mine near Belchatów.

Somewhat smaller clusters of communes with more or less intensive concentration of qualifying features a territorial ex-claves of agricultural problem areas in Poland appeared also to the east and north-east of Warsaw,

in the vicinity of Olsztyn, as well as on the post-glacial landscape of Pomeranian Lakeland. The number of respective communes there is too small or the concentration of the qualifying negative feature insufficient (like in Pomerania or in Sudety) to justify reference to these areas as to the depressed or problem areas in the light of adopted diagnostic features.

Side by side with delimitation of problem areas in agriculture, and in fact of one category of these areas, namely of the so called depressed areas, there is in the opinion of the present author a need of conducting further studies aiming at detailed identification of these areas and definition of problems existing there.

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## REGIONALISM IN POLAND: AN OUTLINE

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**Abstract.** The nature of regionalism as a syndrome of socio-cultural characteristics is discussed in the paper and its implications provided. Relations between regionalism and territorialism are outlined. The socio-political context of Polish regionalisms is presented. A seven-fold typology of Polish regionalisms is proposed.

**Key words:** regionalism, territorialism, autonomism, separatism, national erosion, community, association.

Two contradictory tendencies exist generally now in Europe, i.e. that of integration and liquidation of the international boundaries, on the one hand, and the increase in ethnic and regional separatisms, on the other. The latter are underlain by, especially in the post-communist countries, the revival of national, ethnic and regionalist movements, suppressed during the centralist rule (Szul 1991).

In Poland, regionalist, autonomist and even separatist tendencies can be observed in different parts of the country. The symptoms of the already earlier observed national erosion are reported as a reflection of the diminishing attractiveness of Polishhood not only for the ethnic/cultural border communities but also the originally strict Polish communities and cultural groups (Błaszczak-Waławik et al. 1990; Nawrocki 1991).

### THE NATURE OF REGIONALISM

The nature of regionalism and regional consciousness seems essential to discuss here. Regionalism is recognized as a syndrom of the socio-cultural, political and economic characteristics of the given area. Although culture is always a product of a certain group or collectivity, once developed it indicates a certain autonomy. It then controls the behaviours of the members of the collectivities and is relatively independent of their changing membership (Kwaśniewski 1986).

Regionalism is usually referred to the state of social consciousness of the collectivity living in the given area. This is usually manifested in institutionalized ideological movements and directed social and political activities. A complex of features is characteristic of regionalism, viz. (1) the attachment of the collectivity to their territory; (2) the conviction that the territory

possesses positively assessed properties; (3) the conviction that the collectivity (community) living in that territory creates or has created certain values contributing to the own original culture; (4) the subjective identification with the community and their culture; (5) the need to manifest by various social activities: (a) the attachment to the homeland, (b) the positive assessment of its qualities, and (c) the identification with the community to whom the territory is subordinated, as well as to their culture (Kwaśniewski 1986).

A number of implications stem from regionalism as a social, cultural and political movement. These are (Kwaśniewski 1993):

(1) the conviction that the history-based cultural and civilizational identity of regions is not a symptom of their backwardness and an obstacle for their modern development but rather a heritage that should be referred to, if not followed;

(2) the spatial connotation of regionalism reflected in the cultural characteristics of the local population of historically developed regions;

(3) a relative stability of the regional identity that need not, and even should not, be eroded with the civilizational development as it is not an obstacle for the development; regionalism is always in a sense an autochthonism;

(4) the conviction that the regional identity is underline more by extensive folk communities than the attainments of even most prominent individuals or elites;

(5) the understanding of the region as a separate and limited entity totally included in a more extensive national/political system;

(6) the conviction that the articulation of the regional interests is the optimal way of the implementation of the national interests that cannot break the former;

(7) the promotion of the legal regulations which approve the regional uniqueness, including the cultural autonomy;

(8) the promotion of the regional self-consciousness;

(9) the development of the interregional equity and partnership on the intra-national scale;

(10) the acceptance of any internal influences as unavoidable, useful or necessary components, but not as a basic pattern of the change in the own regional culture;

(11) the recognition of any regional, supra-regional and national centres as products of the bottom-up sublimation of regional and local characteristics and values rather than means of the top-down implementation of the interests of the centre;

(12) the appreciation of the literary and lingual regionalism.

The cultural and/or historical distinctness of a given region from the rest of the country or other regions legitimates regionalist movements and provides them with slogans, and it is this fact that implies traditionalist background of regionalism. Regionalist movements refer to the traditional regionalization, usually very stable, which is challenged by the industrial and social revolutions, producing new regionalizations of their own, which change the prevailing regional pattern, sometimes dramatically. The radical changes in the regional patterns, i.e. the transformations of the traditional into modern regions,

produces frustration; the latter results in the lag of mental regionalization, reflecting the traditional regional patterns, behind the *de facto* behavioural regionalization, reflecting the new regional patterns. As a result of the frustration, one feels he/she lives in an odd, unaccepted, unacceptable and incomprehensible regional pattern, unrelated mentally to the 'proper', i.e. traditional, regional pattern (Rykiel 1985).

In historically new regions, the relative durability of the common lot of the new regional collectivity may, however, result in the emergence of regionalist tendencies. This is especially true in cases of the relatively durable and/or intensive common social, economic and/or political menace or marginalization (Błasiak 1991). The common values of the new regional collectivity, e.g. ecological questions, do then legitimize the regional movements and are used as their slogans.

## REGIONALISM AND TERRITORIALISM

Territorialism refers to the defence of a territory with relatively stable bounds from its invasion and/or utilization by other individuals. Any regionalism is, therefore, in a sense, a territorialism. It is especially the case of 'regionalism' understood as an euphemism of separatism. Socio-economic specialization, i.e. the transition from communities to associations, as well as the development of transportation and communication systems drive at the decay of territorialism (Kwaśniewski 1993).

Crises are, on the contrary, commonly recognized as propellers of regionalisms. Nativism is a routine behaviour of regionalism during crises. These latter are believed to be overcome by perpetuation, i.e. the stabilization of the elements of the local culture, or revivalism, i.e. the tendency towards the revival of those elements of the local culture which have been pushed out by alien elements (Kwaśniewski 1993).

While regionalism in a strict sense recognizes the given region as part of a more extensive national system, it may be, during crises, seen as a stage in a process of national erosion.

This process includes: (1) the initial acceptance of the prevailing cultural affiliation, (2) the tendency to gain a regional self-government, (3) the territorial home rule, (4) sovereignty, (5) the acceptance of foreign political affiliation, and finally (6) the alien national affiliation (Kwaśniewski 1993). This development, even though stemming from regionalism, may transform (stage 4) in a nation-creation process.

## REGIONALISMS IN POLAND

Regional consciousness is a result of the durable and complex social process contributed by a number of objective and subjective factors. It is in this context that the generally limited regional consciousness in Poland should

be seen. This is a result of two main reasons. First, rather frequent changes in the regional divisions in Poland during recent two centuries must be remembered, influenced, at least partly, by the limited physical differentiation of the country. Secondly, the structural weakness of regional consciousness must be kept in mind, characteristic of the communist system with its impossibility of free social self-organization.

The collapse of the communist system in Poland resulted in the freedom of associations and the restitution of the territorial self-government. It was in this context that regionalist tendencies revived, especially in those regions in which the regional traditions of thrift and citizens' autonomy have been subjected to limitations, if not destruction, by centralism and the possibilities to develop cultural distinctness have been hindered or at least limited. This especially applies to those Polish regions which had belonged to Prussia before the first world war and kept a considerable fraction of the local population after the post-second-world-war resettlement. Those people from the former Polish-German ethnic borderland have internalized the social values which could, and even were forced to, be implemented under the Prussian model of the territorial self-government not only on the local but also regional level.

Table 1. The regionalist movements in the 1991 election to Sejm in Upper Silesia

Electoral regions	Upper Silesia			Sosnowiec	National total
	Opole	Gliwice	Katowice		
	Katowice voivodship				
Selected electoral lists	number of seats gained				
Liberal-Democratic Congress (inc. Upper Silesian Union)	1	1	2	1	37
German Minority	3	1	1	-	7
Polish Western Union	-	1	1	-	4
Movement for Silesian Autonomy	-	1	1	-	2
Local total	10	13	17	10	460

The belt of the west-central Polish regions, referred to above, from Gdańsk through Poznań to Opole and Katowice can be, however, distinguished on the rather vague national background. The four regions are involved, even though differentially, in the border community syndrome. After the collapse of the communist system and with the restitution of the market economy, interregional disparities came to manifest and this process reinforces regionalism in the ex-borderlands and stimulates its emergence elsewhere. This implies the expansion of the regionalist tendencies over the country.

### A TYPOLOGY OF REGIONALISMS

A tentative typology of regionalisms in Poland can be provided here. The question, however, arises what are the regions to be subjected to the typology.

For simplicity, the present Polish voivodships are taken as the regions. Even though most of them can hardly be identified with the sentimental regions to which regional sentiments apply, the identification of the two categories allows to ignore a rather complex question of the delimitation, overlapping and hierarchy of the sentimental regions.

Six types of regionalisms, generalized in two main groups, can be distinguished (Rykiel 1993). These are:

- I. strict regionalisms:
  - (1) political regionalism (autonomism),
  - (2) cultural regionalism,
  - (3) economic regionalism,
  - (4) folk regionalism;
- II. quasi-regionalisms:
  - (5) political quasi-regionalism,
  - (6) ecological quasi-regionalism;
- III. (7) lack of regionalisms.

The existence of not only relatively distinct regional consciousness of the respective regional communities but also of regionalist tendencies and movements is the nature of the strict regionalisms (Table 1).

In political regionalism, both cultural and political regionalist movements exist of which at least some are aimed at a differentially understood regional autonomy. This type of regionalism can now be identified in the Opole and the Upper Silesian (western) part of the Katowice voivodships. In both those regions, the local bi- or tri-cultural autochthonic ethnic groups form the social base of the regionalist movements (Damrosz 1987; Malarski 1991; Nawrocki 1991; Szczepański 1991).

In cultural regionalism, cultural-political regionalist movements exist, aimed at the preservation of the cultural identity, the appreciation of the ethnic distinctness and the attaining of the cultural autonomy and political self-government for the respective region. This type of regionalism is now to be found in the Gdańsk voivodship and is based on the cultural, including lingual, distinctness of Kashubians which is essential for the existence of the respective regionalism (Latoszek 1991).

In economic regionalism, political regionalist movements exist, aimed basically at the economic autonomy of the respective region. This type of regionalism is now to be found in the Poznań voivodship (Andrzejewski 1989; Wilczyński 1989).

In folk regionalism, regionalist tendencies of major cultural minorities exist. The tendencies are aimed at the cultural autonomy of the respective ethnic groups as well as the preservation and, possibly, extension of the local autonomy in general while no tendencies can be found to get any form of the territorial autonomy for the respective ethnic group. Moreover, the regionalist or regional tendencies which are explicit among the respective cultural groups in the given regions are not essential for the regional collectivity as a whole and, therefore, do not seem to underlie the more general regionalism.

This type of regionalism can be found in the Białystok and Nowy Sącz voivodships. In the former, it is based on the cultural distinctness of the Byelorussian minority. In the Nowy Sącz voivodship, in turn, regionalism is based on the cultural distinctness of the Highlanders, especially the Podhale Highlanders.

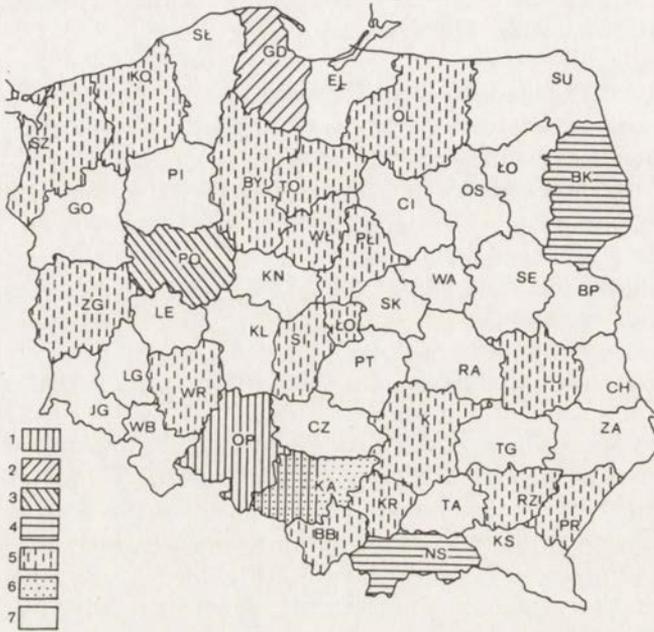


Fig. 1. Typology of regionalisms in Poland

- 1 — political regionalism (autonomism), 2 — cultural regionalism, 3 — economic regionalism,  
 4 — folk regionalism, 5 — political quasi-regionalism, 6 — ecological quasi-regionalism,  
 7 — lack of regionalisms

The nature of quasi-regionalisms is the existence of not necessarily clear regional consciousness of the respective regional collectivities as well as regional tendencies of different but usually limited extent. The tendencies apply usually to part of the region, especially the regional centre. They take a form of regional or local lobbies, aimed at the quasi-political or economic advantages of the region. Specifically understood historical merits of the region or the regional centre legitimize the regional tendencies.

In political quasi-regionalism, regionalist tendencies refer to sentimental and historical premises. The nature of the quasi-regionalism of this type are unspecified emotional ties with the respective regional centre as an important political/administrative centre in the past. Quasi-regionalisms of this type can be found around the pre-1975 voivodship centres and some of the 1975 established voivodship centres, with ancient economic and/or political/administrative traditions (Fig. 1). Their quasi-regionalisms are manifested in the tendencies to cultivate evidences of the respective towns' or their regions' magnificence in different, but past, historical periods. Also, regional

and local lobbies are being formed, aimed at the increase in the respective towns' political role by a considerable extension of their present voivodships and the location of new higher-rank functions in the towns or, at least, at the obstruction in the possible reduction of the administrative rank of the respective towns.

The essence of ecological quasi-regionalism is the integration of the regional collectivity, else heterogeneous, around the ecological menace. The quasi-regionalism of this type can be found in the Katowice voivodship as a whole, i.e. as a historically new region (Błasiak 1991; Szczepański 1991). Interestingly and importantly, at least in this particular region, many social and political problems perceived as taboo are verbalized in ecological terms (Rykiel 1989).

Hardly any symptoms of regionalisms can be found in the remaining 26 voivodships. It is referred here merely to regionalisms related to the respective regions as in some of the 26 voivodships regionalisms related to other voivodship centres can be easily found. The Greater Polish regionalism in the Leszno and Kalisz voivodships, as well as the regionalisms directed to Opole and Katowice in part of the Częstochowa voivodship are examples of this pattern.

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## GEOGRAPHICAL PATTERN OF CULTURAL RELATIONS BETWEEN EASTERN EUROPE AND ITALY, WITH SPECIAL REFERENCE TO POLAND\*

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**Abstract.** The direction and intensity of cultural and scientific relations with Eastern Europe were analysed using the record of the Italian National Research Council from 1988 to 1990. The special attention has been devoted to the contacts with Poland.

**Key words:** cultural relation, research exchanges, collaboration, research projects.

### INTRODUCTION

The far-reaching political, economic and social changes in a former communist Europe, are likely to strengthen the existing close relations between Italy and this area. The main object of our work is to analyse the role Italy may play in such a situation. Among the cultural relations, research exchanges proved to be particularly significant for their peculiar characteristics and the greater possibility of estimating their flows. Our purpose was therefore to find out the importance of such exchanges, their direction and intensity. We considered also of remarkable interest the analysis of the spatial distribution of flows and the identification of the fields of research object of such exchanges.

We used the data regarding cultural bilateral exchanges between the Italian National Research Council (C.N.R.) and corresponding organizations in Eastern European countries (Academies of Sciences). The countries which have participated in these exchanges are: Bulgaria, Poland, Rumania, Hungary and three countries which no longer exist, Czechoslovakia, the Democratic Republic of Germany and the Soviet Union (in order to avoid an unnecessary complication of the text, the afore-mentioned countries will be referred to from now on, also the former Yugoslavia, as if still existing). We considered the average situation over the period 1989–90. The data are relative to the number of researchers who were involved in the exchanges, to the length of their visit and, as regards arrivals in Italy, the research centres attended.

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\* Owing to the innovatory theme of this study, the authors have not been able to compile an adequate bibliography on this subject

Such data were completed with information derived from the C.N.R. database concerning strategic research projects involving research centres in Eastern European countries, including Yugoslavia and the Soviet Union. In this case the data refer to the period 1988–90.

Unfortunately, the two different sets of data were found to be incomparable: on the one hand we have Italian and foreign researchers who actually moved to another country for varying lengths of time, and on the other, periods of collaboration, usually lasting several years, between various research centres which do not necessarily cause a change of place. By using the first set it is possible to analyze and quantify the actual flows, while in the second case we obtain a map of relations on a more general level.

The analysis of the movements was carried out with the same methods that are normally used for the study of tourist flows: although the number of researchers in the various centres was taken into consideration, more importance was given to the number of days they stayed, considering therefore the length of stay which gives us a better indication of the strength of relations.

## RESULTS OF THE RESEARCH

As might be expected, flows from and towards the Soviet Union are more numerous and on average longer. Exchanges with the other partners involve on average 70 researchers a year (170 with the Soviet Union), for an average stay of 19 days for each researcher (25 days for Soviet researchers). Inward flows to Italy are clearly greater than outward flows (Figs 1, 2). Only the numbers of researchers going to and coming from the Soviet Union are practically equal; the flow of Italian researchers towards other Eastern European countries is half that of foreign researchers arriving in Italy. A similar difference is evident between the total length of stay of Italian researchers in Eastern European countries, which amounts to about 3800 days in 1990, and the stay of foreign researchers in Italy, which exceeds 7200 days. Particular disparity in the flows is recorded in the relations with Hungary (ratio of 1 to 4) and with Bulgaria (ratio 1 to 3).

The reasons for this disparity are numerous and the data we have — cannot help us to identify them. It is probable that, among the general causes, Italian researchers are influenced by the greater appeal of other countries of the European Community and the United States, as well as by the greater bureaucratic difficulties involved, until a few years ago, in going to the Socialist countries. Moreover, the more consistent flow towards Italy does not necessarily mean that countries of Eastern Europe are scientifically dependent on Italy: on the contrary, the arrival of researchers often gives rise to an exchange of information.

Three quarters of the flows (considered as days of stay) concern proper scientific studies, among which more than one third for chemistry and physics, 10% for medical sciences and a good percentage for mathematics and information technology. In the arts field there is great interest in linguistic and

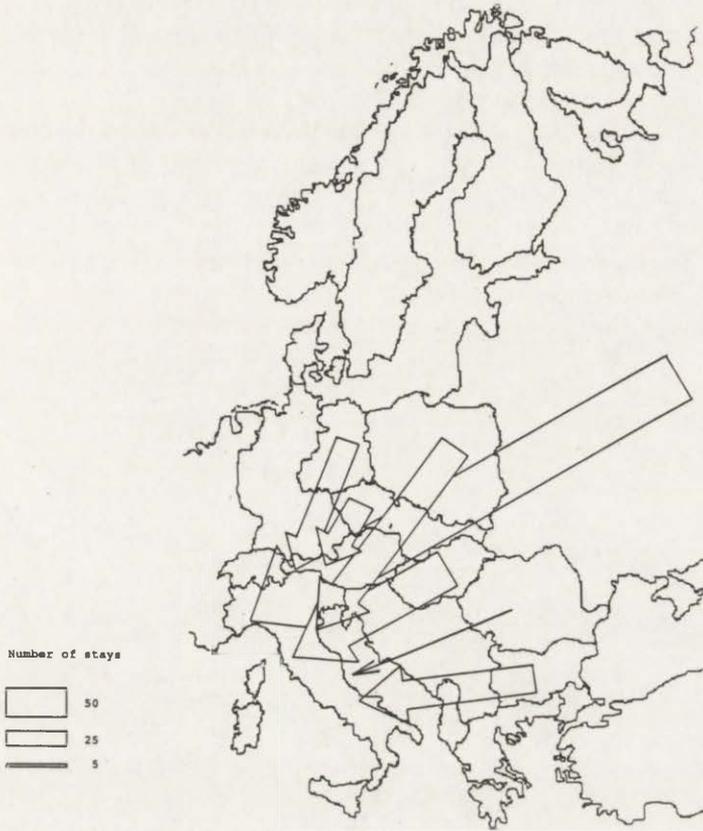


Fig. 1. Flows from Eastern Europe to Italy

literary studies (about 8% of the total flows), and also in philosophy and socio-economic sciences. If we separate the flows into the two directions (Figs 3, 4), we observe that the Italian researchers are greatly interested in linguistics and mathematics; from the data, in fact, it emerges that, whereas the general tendency is a prevalence of movements towards Italy, in the fields of linguistics and mathematics outward flows predominate by far. As far as foreign researchers are concerned they are proportionately more interested in biology and in historical-philosophical studies, although philosophy shows a trend of its own: there is a heavy flow of Italian researchers towards the universities of Eastern Germany with their traditional philosophical culture. The movement related to law subjects is also anomalous, as can be seen by the slight difference in social and economic sciences (Figs 3, 4), for which unidirectional flows towards Poland, Eastern Germany, and the Soviet Union has been noted.

In order to identify a polarization in these relations we have examined the number of research projects (Table 1) centred for their organization or collaboration in Italy and in Eastern European countries.



Fig. 2. Flows from Italy to Eastern Europe

Table 1. Number of projects between Italy and the various countries of Eastern Europe

Bulgaria	13	Poland	109
Czechoslovakia	65	Rumania	6
East Germany	27	Hungary	53
Yugoslavia	27	Soviet Union	119

The Italian centres involved in the projects examined in the period 1988–90 turned out to be 57; foreign centres numbered 50 (Figs 5, 6). In Italy, besides university centres and C.N.R. institutes, public bodies and private sector companies take part in the programs. They are dominant in at least 15 research centres. Of the Italian cities which appear most often as research centres involved in the projects, we find 7 of the 10 major cities, and 3 university centres of undoubted prestige (Padua, Pisa, Parma). Parma and Padua, with Turin and Ferrara, are also the cities where researchers' stays are longest.

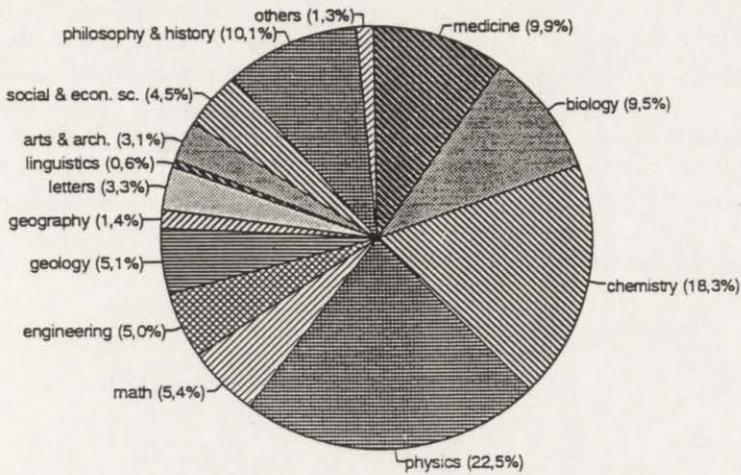


Fig. 3. Distribution of flows from Eastern Europe to Italy in research fields

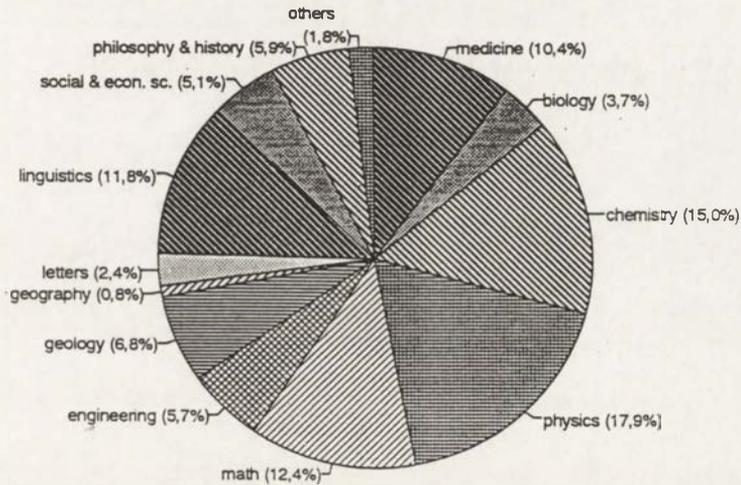


Fig. 4. Distribution of flows from Italy to Eastern Europe in research fields

The most frequently mentioned foreign cities are Moscow, Warsaw, Budapest and Prague. In fact it is the capital cities which play a leading role, being home to most of the projects analyzed. However, in Poland and Eastern Germany there emerges a more articulated spatial structure which involves less important cities; this is contrary to what happens, for example, in Hungary where research is concentrated mostly in the capital. This obviously follows the urban structure of these countries.

The fact that the capitals are often the seat of many of the projects considered may in part be due to the organization of research activity in

Eastern Europe, structured on the basis of the Academies of Sciences. The state administration of scientific research has, however, favoured cities which, within the federal states have now been broken up, functioned as capital cities: in other words cities such as Mińsk and Tallin in the Soviet Union, Bratislava in Czechoslovakia, Ljublijana and Zagreb in Yugoslavia have inherited superior functional assets from the old federal structure, including those in the scientific-technological field. This gives us an idea of the potentiality which the new capitals will have, as can already be seen in the description of cultural exchanges in 1990.

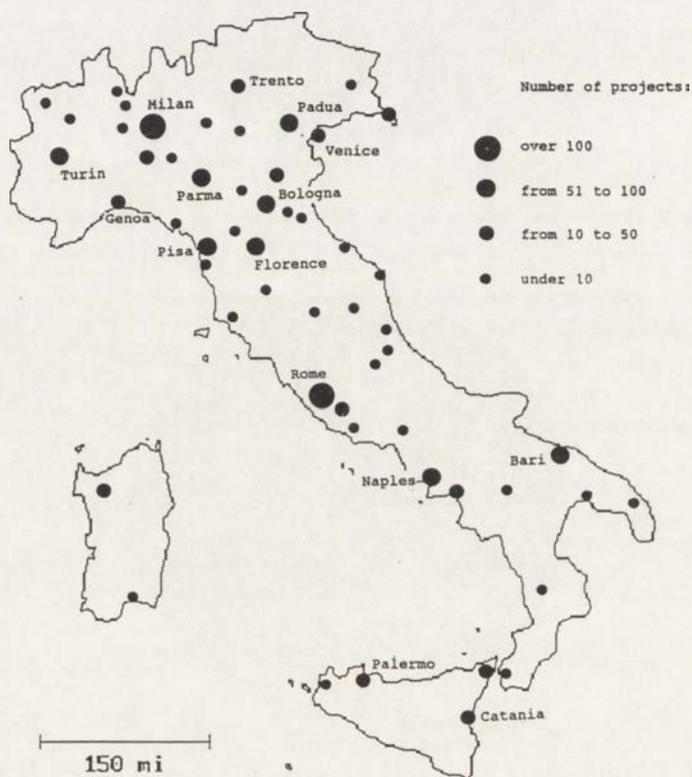


Fig. 5. Major research centres involved in CNR's projects in Italy

## RELATIONS WITH POLAND

A more detailed study of the scientific relations between Italy and Poland confirms the general tendencies discovered and above all the clear prevalence of the flow towards Italy. Poland likewise registers a slightly above average value (except for the Soviet Union) both for the number of researchers involved in cultural exchanges and for the average length of their stays.

Polish and Italian researchers who have taken part in the bilateral rela-

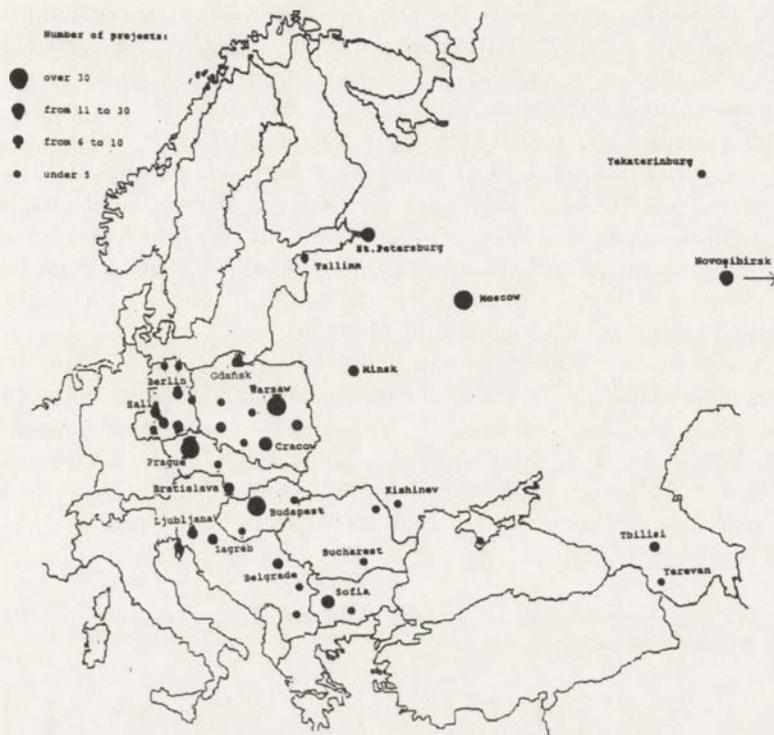


Fig. 6. Major research centres involved in CNR's projects in Eastern Europe (boundaries in 1990)

tions concerned numbered 81, with an average stay of 22 days, for a total of 1744 days (Table 2). In particular, Polish researchers who attended Italian research centres numbered 54, this number being exceeded only by the Soviet Union and Hungary; moreover the incidence of the flow from Poland towards our country is confirmed by the data relative to the average length of stay (23 days), which is inferior only to that of the Soviet Union.

Table 2. Intensity of the flows between Italy and Poland

	Total days	No. of arrivals	Average stay
From Poland	1254	54	23
Towards Poland	490	27	18
Total	1744	81	22

Until now we have considered only those relations which have determined a movement of people between Poland and Italy. For a closer analysis it is necessary to examine the data related to strategic research projects which involve scientific organizations in both countries: in fact the very highest number of programs of collaboration, which derives from the C.N.R. data base allows us to use a larger and more significant sample. During the

three year period between 1988–1990, as many as 109 collaboration programs were registered, a far higher number than that of other Eastern European countries and similar to that of the Soviet Union (119); these relations, in 11 disciplines, involved public and private research centres in 38 Italian cities and the scientific institutions in 9 Polish cities.

With reference to cooperation programs between single cities we note that, as shown in Table 3, there are particularly strong relations between the two capital cities and between these and all the other foreign centres. Although to a lesser extent, there are other cities with numerous partners: in Italy we find Bologna, Milan, Naples, Padua, Salerno and Turin, while in Poland the centres of Cracow and Gdańsk.

The occurrence of “privileged relations” between pairs of cities is rather interesting; these often derive from processes of specialization, as between Lublin and Turin in agricultural sciences, Gdańsk and Padua in geology and Cracow with both Trento and Frascati in physics. The close relations between Warsaw and Rome and Milan are determined by numerous disciplines, as is also the case between less important cities such as Wrocław and Naples.

Table 3. Programs of collaboration between Italian and Polish cities (Italian cities with at least two partners)

	Wrocław	Cracow	Gdańsk	Katowice	Łódź	Lublin	Poznań	Warsaw	Zabrze
Bari		1						12	
Bologna		2	5		2	2	1	8	
Camerino		1	2					1	
Ferrara		3						2	
Florence			2		1			4	
Frascati		9			1			2	
Genoa		1						4	
Ivrea							1	1	
Messina		3						1	
Milan		3	1			1		36	3
Naples	8	1	1		1			14	
Novara	1	2							
Palermo			1					2	
Padua		1	7			4	1	19	
Perugia		1	2					3	
Pisa					4		1	7	
Parma		2						8	
Pavia	2							6	
Rome	1	30	2	1	1	1	3	57	6
Salerno	1	1	1				1	1	
Sassari		1						2	
Trento		11						3	
Turin	2	5	2			9		5	
Venice			2					2	

If we focus our attention on Polish research centres, we notice that only in a few cases is the activity carried out directly by government institutions (ministries). Instead, most of the projects are run in equal measure by the Academy of Sciences and the Universities. The research centres with international relations are generally in the most important cities as shown by the strong correlation between demographic size and the number of projects (Fig. 7). If we consider this last parameter as an indication of the extent to which scientific structures are equipped, we find, apart from the clear prevalence of Warsaw, some cities with quite a high level and others which are relatively poorly equipped: in the first group we find Cracow, Gdańsk and Lublin with a decidedly favourable projects/population ratio, in the second the cities in the bottom right part of the graph (Łódź, Poznań, Katowice), while Wrocław and Zabrze are in an intermediate position.

Our data do not reveal a high level of specialization in these nine cities, however, some typicalities come to light which have already been seen in part in the analysis of collaboration programs with Italian centres. We refer in particular to Lublin which is highly oriented towards exchanges concerning agricultural sciences, a discipline which moreover does not appear in any other Polish city (Table 4a); Warsaw and Cracow are equally predominant in international projects connected with chemistry and reveal a greater range of disciplines compared to less important centres. Warsaw of course confirms its leadership in nearly all subjects and the monopoly in medical research.

A concise description of the situation between Italian partners (Table 4b) reveals a tendency towards polarization in some scientific disciplines, such as the afore-mentioned "specialization" of Turin in projects related to agricultural sciences. It is obvious that the metropolis of Rome plays a predominant role in numerous subjects and, above all, in chemistry, geology and information technology, followed by physics and medicine; the University of Padua also has an important role in this last subject. The research centres of Trento and Frascati are both heavily involved in physics; the nuclear physics laboratories of the second one strengthen the role of the Roman metropolitan area. Finally, we must mention Milan, specialized in mathematics and engineering and, in the Mezzogiorno, Naples in engineering and Bari in biology.

Table 4. International relations in Polish and Italian cities: number of projects per subjects

a) Poland	agr	biol	chem	phar	phil	phys	geol	inf	eng	math	med
Wrocław		2	2			4					
Cracow			9	1		6	4				3
Gdańsk			4			2	2				1
Katowice											1
Łódź			1			1			2		
Lublin	4										2
Poznań								2			
Warsaw		8	8		2	14	4	5	4	2	14
Zabrze			1			1					

b) Italy*	agr	biol	chem	phar	phil	phys	geol	inf	eng	math	med
Bari		12					1				
Bologna			6			4	4	2			2
Camerino			1			1	2				
Cosenza			4								
Catania			2				2				
Ferrara			2				1		2		
Florence		1	1			1	2	2			
Frascati			1			10					
Genoa			2			1	1				1
Messina			4								
Milan	1	6	6		2	4	5	1	8	10	1
Naples		5	2			5	4		7		1
Novara			3								
Palermo			1			2					
Padua			1			2	6	1			19
Perugia							6				
Pisa		2	1					2	4		3
Parma		4				5	1				
Pavia			1			1			2		
Rome	1		26	1	2	16	16	14	2		23
Salerno		1	1			1		2			
Sassari		2					1				
Trento						13	1				
Turin	9		4			6	3	2			
Venice						1	3				

\* cities with at least 4 project;

agr — agricult. science, biol — biology, chem — chemistry, phar — pharmacy, phil — philosophy, phys — physics, geol — geology, inf — inform. tech., eng — engineering, math — mathematics, med — medicine.

## CONCLUSIONS

Setting aside Western Europe and North America, which are the principal partners of Italy, half of the programs under examination involve Eastern European countries. For example, the number of Italy's cooperative research programs with Poland is similar to those with Canada, Spain or Japan. As we have already observed with regard to research projects, most of them concern physics and chemistry. In almost a quarter of such projects, many lasting several years, Italy and one or more countries of Eastern Europe are the exclusive partners.

In conclusion, we have been able to evaluate, even if only on the basis of data from a three year period, the importance of exchanges of researchers and research projects involving Italy and Eastern European Countries. Contacts between researchers are frequently the basis for active programs of cooperation. Furthermore, Italian participation in research projects carried out by public bodies and big industries implies an increase in relations in

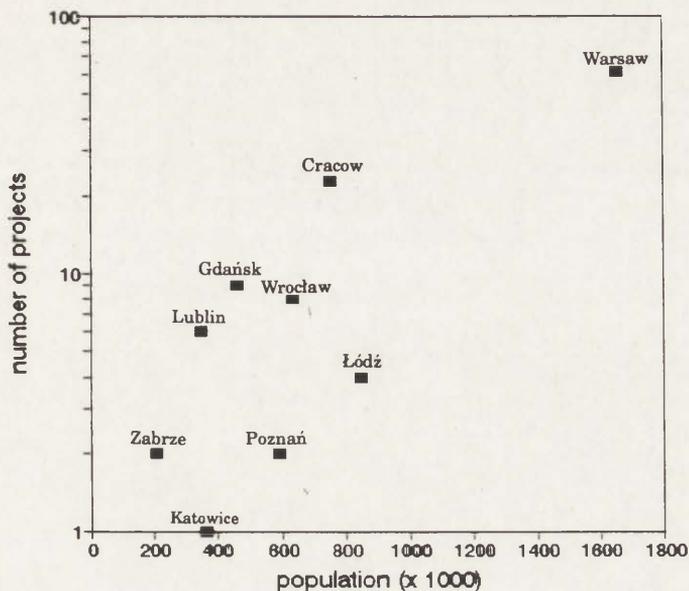


Fig. 7. International research projects in relation to demographic dimension

economic and commercial fields as well, especially when information does not move in unidirectional channels. It would be interesting to examine the development over time, but we can already suppose a future increase in scientific collaboration and in the number of projects such as those discussed, precisely because of the most recent strengthening of relations between the countries of Eastern Europe and the European Community. In some fields of research Italy has reached the same level of specialization as the most advanced countries, and can therefore compete as a scientific reference point with the countries that traditionally produce information and technology. It would be of great interest to analyse the reasons underlying the collaboration between Italy and Eastern European countries as compared with those prompting exchanges with other scientific partners. Have Italy's particular cultural inheritance, its particular political stance worked alongside its strategic geographical position to promote some sort of exchange preference?

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