URBAN ENVIRONMENT

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GREEN PAPER ON THE URBAN ENVIRONMENT

With a view to the preparation of the *Green Paper on the Urban Environment*, Directorate-General XI of the Commission of the European Communities organized a series of international conferences attended by officials and experts from cities throughout Europe, the results of which have been extremely valuable.

This document, which contains the summary reports of all the conferences, together with studies on specific topics prepared by various experts, provides an opportunity for further development of the subjects covered in the *Green Paper*.

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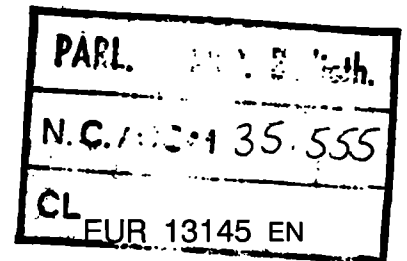*Contributions*

COMMISSION OF THE EUROPEAN COMMUNITIES

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Printed in Belgium

TABLE OF CONTENTS

Conferences

1

THE DECLINE OF INDUSTRIAL AREAS AND EUROPEAN CITIES

Synthesis of seminars in Brussels (13 June 1989) and Terni (1 and 2 December 1989)

Bernardo SECCHI

Architect, Professor at the Department of Architecture of the University of Venice

In June and December of 1989 the Commission of the European Communities organized two seminars in Brussels and Terni entitled 'The decline of industrial areas: the Bicocca project and other similar projects in Europe' (Brussels, 13 June 1989) and 'The steel towns of Europe' (Terni, 1 and 2 December 1989).

The subject of the Brussels seminar were the policies on declining industrial areas adopted by the various Member States, metropolitan areas and cities of Europe. The European Economic Community presented the Bicocca project, a programme to transform a large industrial area north of Milan into a technology park, as a good starting point for seriously rethinking the whole problem of converting large consolidated manufacturing areas in the various towns and regions of Europe.

The main initial assumption, which was to serve as a basis for further study, was that it was possible to identify in Europe different types of industrial area which are disused or are becoming disused. These types can then probably be related to various models of industrialization based on historical developments in the various countries, regions and areas of Europe. It should then be possible to draw, albeit tentatively, a map of the different patterns of development, describing their main characteristics, the specific problems affecting them and the policies adopted to solve these problems.

There are possibly even greater differences between the policies adopted to tackle the problems which arise when various kinds of industrial area are abandoned. Not only are these problems tackled at different institutional levels in the different countries, but for various reasons they may either be

seen as just problems or as opportunities which not only emphasize the profound social *malaise* arising from the decline of large industrial areas but also make it possible to redesign the city or the region both physically and in terms of its economic and social structures.

The Terni seminar was designed to focus attention primarily on the special case of steel towns and regions. These are towns and regions which, as the industries have declined, have become crucially important because of the tremendous repercussions of their decline, because of the serious social problems which have tended to arise and because of the specific nature and location of the plants which have been abandoned.

Terni is a town where the steelworks was abandoned and has now been transformed into a congress and exhibition centre. The aim of the Terni seminar was to compare projects devised for various towns and regions of Europe and to think in practical terms about possibilities and probabilities: the possibilities of converting an urban and regional environment and the associated economic, architectural and planning structures which have been strongly dependent on and influenced by the steel industry; the probabilities of the projects designed to convert these towns and cities being actually implemented.

The aim was not so much to describe situations which are now very familiar but rather to compare proposals, projects, programmes and ideas and to fire the imagination of the various public officials and others who are particularly concerned with the problems arising from the decline of vast industrial areas.

Naturally the two seminars did discuss other topics — often in considerable detail — expanding on the studies and proposals presented by each of the participants. Discussions made it possible to emphasize two main problem areas.

Brussels: The demise of the nineteenth-century city

Underlying the enormous problem of the decline of industrial areas is an even vaster phenomenon.

Until further studies are made, it is not possible to arrive at a precise estimate of the total area which has been abandoned or is being abandoned in Europe. No one has yet tried to do this and it would not be possible even to hazard a guess as to its order of magnitude.

Attention is now being concentrated on the most important cases; on the largest areas, undertakings and plants which form the nucleus for many smaller firms, often scattered over very disparate urban, suburban or rural areas or in small towns or marginal regions. Depending on the particular town, these industrial areas may occupy a few dozen hectares or several hundred hectares. In Europe as a whole, these areas may add up to some several thousand hectares in the EEC Member States alone.

These orders of magnitude are likely to increase considerably if we take into account what is likely to happen in the countries of Eastern Europe.

It is difficult to interpret a phenomenon on this scale as being the result of economic changes. Nor should we think that it can be tackled by short-term policies and that the problems involved can easily be confined and solved.

The underlying causes are many, although they were mentioned only briefly in Brussels. Marcel Smets summarizes them once again on the following pages. The causes vary in each specific situation, as do their repercussions and particular importance, but generally the abandonment of industrial areas is perhaps the clearest indicator of the final demise of the nineteenth-century city in terms of land-use planning and economic and social structure.

The abandonment of industrial areas highlights the fact that important technological equipment like gasometers, railway depots, bridges and canals, port infrastructure, the quays and wharfs, major social infrastructure, like hospitals, prisons, schools and markets, and major military installations are also gradually falling into disuse. Towns that not long ago seemed to be a dense network of houses and factories where it was difficult to find room for new social infrastructure or other installations are now becoming nothing but empty spaces and sites which suddenly are no longer used for any specific purpose and are now available for re-use, although it is difficult to imagine how.

Clearly these phenomena are interlinked, although the links are not always obvious. Just to give an example, the abandonment of railway stations, or of canals, bridges and wharfs and certain technological installations would appear to be an immediate consequence of the abandonment of large industrial sites, although it is just as much due to changes in methods of transport or energy policy. On the other hand, the

abandonment of certain types of social infrastructure is rather the effect of a change in attitudes to social and public affairs in modern society, at least in terms of new ways of reacting to social demand and perhaps the gradual demise of the Welfare State which was a feature of societies industrialized some time ago.

In more general terms, radical changes in the structure of final and intermediate demand have brought about equally radical changes in the structure and geographical distribution of production. In some areas of towns, regions, countries or even continents certain industries have declined and in other areas new activities have emerged. The geographical factors determining the flows of raw materials, semi-finished products and finished products have changed, whole ports and markets have been abandoned and goods now travel by different means, between different places, along different routes and using different infrastructure. Changes in one place have had repercussions in places a long way away. Frequently, attempts to maintain market positions, income levels or employment rates have had the effect of speeding up, or slowing down, the introduction of new manufacturing techniques and these in turn have either caused new plant or infrastructure to become rapidly obsolete or have resulted in them being kept in place, come what may, thus diverting resources from other possible uses. This can lead to serious social problems, the chief of which is unemployment and all the extremes to which this can lead, and these in turn highlight yet more problems. With unemployment often comes a refusal to accept the urban living conditions typical of the first industrial suburbs, now totally run down. In this sense, the phenomenon of declining industrial areas rapidly ends up having repercussions on town planning in general, with all its social ramifications.

One way of gaining a very clear idea of the extent of the whole process is to mark on a map of the more seriously affected European cities or regions the industrial areas which are already disused or are in decline, and in particular the sites of the main industrial plants, the markets, the social infrastructure and the other installations which are gradually being abandoned at least partially as a direct or indirect result of the decline of industrial areas.

In many cases towns or regions developed into their present form around these areas and because of them. In many cases too the structure of other features of the urban or regional environment, the location and nature of residential and shopping areas and the road and transport network can be described and explained only in terms of these industrial areas. In other cases, these same areas served as the framework for establishing and consolidating the relationship between the population, its activities and the natural features of the region or locality: a river or a mineral deposit which determined the location of the first industrial plants and is the main reason why the conurbation came into being and why people came to live and work there, developing the area and the region by building new plants and infrastructure.

The cities of the nineteenth century were primarily industrial cities. It is industry which basically determined their geographical structure, although each specific town contains an infinite number of variations on this theme. All their infrastructure, which was largely public property, constituted the fixed capital which to a large extent made possible and guaranteed the development of industrial production in particular and the whole social process in general.

A large proportion of the fixed capital constituted in the second half of the last century now serves no useful purpose, although not entirely because of the decline of large industrial areas.

The physical nature of a city or region reveals its social and economic characteristics. Its social geography depends on the interrelationships between the various social groups, on their relative sizes and on how they have influenced the economic history of the locality or of the country. The disuse of vast industrial areas, and later of plants, equipment and infrastructure as a consequence, testifies to fundamental changes in the relationships between the various sectors of society and their different activities and, as one would expect, this is the aspect which attracts most attention and fires political imaginations.

However, while huge industrial areas, large plants and industrial installations and major items of infrastructure are being abandoned, there is also severe competition for space. This makes the problem even more complicated, but at the same time points the way to possible solutions.

Although the situation is different in each country, region, metropolitan area and city, the drastic decline in the demand for urban sites for certain manufacturing industries and social services goes hand in hand with an equally dramatic increase in demand for sites for other manufacturing activities, business ventures and social amenities. What is happening is not

so much a decline or even a widespread change in production methods which places a premium on saving land, but a change in the technical constraints which tie certain activities, not only manufacturing activities, to the use of land, particularly land in urban areas.

All city-dwellers are pressing for more space for houses and gardens, for driving and for parking at home, at work, at shopping centres and at the sports grounds and entertainment facilities they frequent from time to time. They also need more space for leisure activities. So, generally, various sectors of society are calling ever more clearly and loudly for more open spaces in towns and in the most heavily built-up areas.

The idea of living space is now much less likely to be referred to in terms purely of guaranteeing the minimum space required to carry out the social reproduction process but rather in terms which echo the new belief that the environment, particularly if it is something that can be referred to by the term 'nature', is of indubitable value.

Each product requires ever more space. It has to be stored, it may then have to be put on display to potential customers and then it moves on to the consumer circuit. Afterwards it needs more space where it can be disposed of before being destroyed, or transformed in order to enter a new production cycle. Here again, although some production cycles have reduced their demand for space considerably, others require more. Often this has something to do with delicate questions about industrial relationships, environmental requirements at the place of work, demand for facilities and amenities and refusal to accept the working environments typical for the older industrialized areas or those which tend to be found in office blocks built in the last 20 or 30 years.

However, the idea that these empty spaces can easily be filled by the new demand does not work very well in practice, unless the public authorities make a special effort to make it work. In every case it is clear that intervention by the public authorities is necessary, not only because of the extent and seriousness of the social problems which make them a natural interlocutor but also, and perhaps more importantly, in order to resolve certain differences of opinion and attitude between the two opposing sides.

Generally — as far as it possible to generalize in a continent which is as diverse as Europe — new developers and old established residents tend to have nothing to do with each other.

The former are developing geographical and social areas which often conflict with the interests of the latter and there is a marked tendency for the new to refuse to recognize the old.

There are a number of modern trends which need to be explained. For example, the managers of large and medium-sized undertakings tend to locate their offices along main roads outside conurbations, often between the town and the airport, in areas of high scenic value. Other manufacturing industries prefer to have a better relationship with the environment rather than close to specific amenities. Many businesses set up large showrooms along main roads. Certain sectors of society prefer to live in the suburbs away from the most densely populated and often most polluted part of the city. Ten or 20 years ago the reasons given would be that newcomers were moving outside towns simply because there was no longer any room inside, the idea being that industrial activities and sections of society would have preferred, if feasible, to be as centrally located as possible and that the expansion of the city and the metropolis over an increasingly vast area was 'only' the result of its own growth. Now more complex, although not necessarily opposing, explanations are required.

The areas of nineteenth-century towns which are now, in part at least, abandoned — and these include industrial areas and areas occupied by large manufacturing plants, and social infrastructure and even military installations — are now of considerable value, in terms of both the buildings themselves and, the positions they occupy. They are often in central positions and with all the equipment and infrastructure which has grown up around them, much of it now obsolete, the areas they occupy are now valuable even though deserted. Their market prices seem to reflect attitudes left over from the previous stage of growth of the city when central positions were actually in demand because of serious competition for space, rather than because of real potential for use in the future. Public intervention, and plans to restore, re-use and redevelop abandoned industrial areas, rail depots and military installations often have the effect of putting a price on expectations, but they also ensure that at least some of these expectations will be met.

But this subject too calls for considerable caution as it raises questions which are not easy to solve.

Very few studies have been carried out in the various towns and regions to compare the numbers, locations and types of

new areas which can be expected to be required over the next 10 years or more by various sections of society and for various activities with the numbers, locations and types of areas which have become available because they have been abandoned. If such studies were carried out, it would become clear in many cases that there is very little likelihood, given the vast areas of land which are being abandoned for one of the reasons explained at the beginning of this document, that in the reasonably near future all the land now falling into disuse can be restored or put to profitable use; at least, profitable use according to the profitability tests which are now conducted on property investment which do not take account of current land pricing structures. Many of the social and town planning policies now being implemented can be seen as attempts to redistribute the costs of redevelopment between various sections of society and various activities, thus largely avoiding a situation where the entire costs fall on job creation schemes and hence on salaries, or conversely on land prices and hence on property values. The growing number of urban architecture projects, which are often high-prestige projects covering vast areas of the city and aiming to give them new functions, designs and identities, can be seen as a clearer indicator of increased competition for space and also of the attempt to establish criteria and systems of priority for areas which can and must be put to profitable use but which might instead be finally abandoned or used for socially useful and important functions which are not economically profitable in the short and medium term.

In many cases, because of the very nature of the industrial cities of the nineteenth century, which have deteriorated even more because of the urban and suburban expansion after the last world war, it would seem reasonable, or perhaps essential, to make many of these abandoned areas into huge city parks which are planned in such a way that they are not just one solid area but permeate the surrounding urban areas to prevent them from becoming too congested. This will reduce potential for pollution and make it easier to build social infrastructure. However land values tend to stop schemes of this kind before they start. Because of the value of areas near the centre of towns, which derive from the way in which the surrounding area, the district, and the residential belt were used in the past, it is unlikely that certain schemes will be proposed. The need to solve specific problems, e.g. traffic and parking, in adjacent districts and the difficulty of financing public works on this scale often result in contrary policies designed

to use the area more intensively. These high land values are often used as a good starting point for schemes to restore the historic centre of the town and to re-examine the role of the town as a whole within a broader regional and European context. Many authorities have viewed the decline of industrial areas not only as a problem, but also as an opportunity to redefine objectives relating to the growth and development of the town's economy and culture. Many of the cases studied at the Brussels seminar come into this category.

There is no doubt that the decline of industrial areas is and, for some considerable time, will remain the main indicator of a profound change in the economy of various countries, regions and cities of Europe. It is also evidence of the often very severe social and human distress, impoverishment and marginalization which accompanies this process. Quite rightly, local and national authorities will be focusing their attention principally on these problems for a long time to come. It is chiefly to solve these problems, and meet the costs, that the various Member States and levels of government decided upon and devised plans of action and schemes to transfer resources.

However, given the new environmental sensitivity which is an indelible feature of our time, the demise of the nineteenth-century city is beginning to be seen as an opportunity which should perhaps not be neglected to redesign our cities and regions in ways more in keeping with this concern for the environment and with the various specific social requirements which are the consequence of it. The projects devised by Rotterdam, Bilbao, Barcelona, and Vienna described in Brussels respectively by Riek Bakker, Eduardo Leira, Pasqual Maragall and Hans Hollein and the policies adopted by Glasgow, Birmingham and Lille as described by William Miller, Albert Bore and Régis Caillau demonstrate that this is possible and give some idea of the major practical problems. They give Vittorio Gregotti the opportunity to give a theoretical outline which will then be discussed in greater detail.

Terni: Declining industrial areas — an opportunity to reorganize or redesign the city

Let us first explain the title in greater detail. Declining industrial areas provide at least two opportunities, both of which were discussed and illustrated at the Terni seminar.

From one point of view, the social problems arising from the decline of industrial areas are so serious that they prompt

many members of society, not always public authority figures, to seek policies which can alleviate and solve them. They try to find ways of promoting the economic and social growth and development of the town or region which are different to those followed in the past. They seek to give responsibilities to a whole range of new interest groups with new methods of working together.

The sheer scale of the problem urges and compels the authorities to develop ideas and scenarios, to assess their feasibility and external and internal coherence and to try to estimate the likelihood of particular specific individuals and operators being able to bring them about.

Obviously it is difficult to generalize in this connection. There are often considerable differences from one situation to another. To begin with, the most affected areas tended to try to solve their problems by defending the status quo or by applying for special funding to help them alleviate at least the most serious social problems, usually the effects of sudden unemployment. Later, the policies proposed tended to take on a more 'narrative' approach to the effect that the crisis and the feared decline had been avoided or overcome by steering the industries concerned towards real technological progress. It was maintained that obsolete plants and industries had been replaced by high-technology plants and industries and that the old declining industrial areas were being replaced by science and technology parks epitomizing all that was new. A lot of European experiments began in this way.

Subsequently, and more practically, attempts were made, without abandoning the old positions, to use the extensive demand for space emanating from the various branches of the tertiary sector, to convert manufacturing structures and the economic, social and employment aspects, and the very physical structure, of the urban areas and regions affected by industrial decline. At the same time, the concept of science and technology parks and the variety of forms that these could take was defined even more closely, partly to decide whether they were feasible and partly to decide on the constraints which should be imposed upon them.

At a still later stage, as work actually started on planning and transforming disused industrial areas, a number of new and tougher environmental problems emerged. These concerned the feasibility of cleaning up pollution in the abandoned areas, a task which often could not be completely successful

and would require a remarkably high level of expenditure which had not been planned for at the beginning. Broader questions also arose about the very concept of industrial towns and their requirements.

Thus, the first series of considerations on the process of development and growth of the economy of the town or region ran into, and to some extent led to, the second set of considerations on re-using the land in the town and the industrial area. According to this second point of view, the decline of industrial areas was seen increasingly as an opportunity to re-think and redesign the physical, functional, economic and social aspects of the city and region and even to redefine them. In many cases, the decline of industry and the areas which were the sites for the major plants and installations of the nineteenth-century industrial town have provided the opportunity for an active new town and land-use planning policy. Examples are the Ruhr, Bilbao, the Meuse valley, Genoa, Taranto, Terni and Bagnoli.

Disused industrial areas are nevertheless a problem. Perhaps they were only perceived as a serious problem as dissatisfaction with city life became more widespread. To begin with, this dissatisfaction concentrated on the shortage of space, so that the sudden availability of disused areas seemed one way of solving the problem and finding room for the social and environmental structures which the town and region was lacking.

However, attention rapidly focused on more complex aspects, which are even more difficult to identify and define with any precision but are generally referred to as qualitative features of the urban and regional environment.

Criticism and dissatisfaction, in extreme cases at least, were not directed so much, or only, against the nature of the urban environment of the industrial town as such but more generally against that of the modern city, typically in some countries the 'public' city, in other words, a city built as a result of direct public authority funding demonstrating the efforts and intentions of various housing and social policies and of architects and town planners.

As large industrial areas, railway land, port infrastructure and large plants and facilities of the industrial town fell into disuse, large vacant areas became available on the edges of towns which seemed to provide an opportunity for solving the problems typical of these areas. The decline of industrial areas and

the much vaster phenomenon of which this is only a part, together with attempts to devise practical projects for re-using each site and the whole area, all then required new in-depth appraisal of the nature of modern towns and particularly their suburbs, and hence a total rethinking of towns and residential areas.

Once again, because of the sheer scale and extent of the problem, it was out of the question to adopt a piecemeal approach to studies and planning. It was necessary therefore, although extremely difficult, to get away from fragmentary town planning policies, whereby *ad hoc* solutions were continuously being found for each problem, and instead to devise demonstrably valid plans and policies to treat the problem as a whole.

Most of the major efforts in Europe followed this path and, along the way, experimented with new institutional and technical approaches to town planning, new types of plans or — another way of saying the same thing — plans containing an increasingly large proportion of grand and extensive urban architecture projects.

The examples given in Terni — Genca, Taranto, Naples, Bilbao, Lille, the Meuse region, the Ruhr and Motherwell — made it possible to compare studies, plans and policies which had many points in common: attempting to put the area to different uses, carefully planning the use of empty spaces before that of built-up areas, re-using land, infrastructure and buildings which are part of our recent archaeological history, putting the town and its industrial environment into its historical context together with its main architectural features (canals, bridges, reservoirs, workshops and factories), trying to forge links with the periphery of the city and outlying areas, attempting to create variety, getting away from the concept of the suburbs and the metropolis and finding in them new ways in which modern businesses can express themselves, while at the same time trying to diversify the use of the urban and regional area, not in general terms but taking account of the specific nature of each site and the differences which there will always be between our businesses, their organizations and their living environment, restoring the balance between open spaces and built-up areas in favour of the former and increasingly emphasizing the importance — in terms of providing room to move and as a statement — of having wide open spaces, gardens, allotments, sports grounds, parks and farmland in amongst the urban and metropolitan area.

In many cases, the projects put forward raise a number of problems, more problems in fact than they solve. However, it is certain that in this way these disused areas, which were originally industrial, have prompted a rethinking of the nature of today's living environment.

It is difficult to overestimate the importance for the towns and regions of Europe of the decline of large industrial areas and the abandonment of the equipment and infrastructure whose main *raison d'être* was once the industrial city. This process is the most visible aspect of a fundamental change in the basic nature of Europe's society and economy and should be tackled with a series of policies whose conceptions and scope matches the scale of the problem.

There are many problems which have to be solved before general and local policies can be formulated. The main ones are listed below.

(i) The first requirement is to arrive at reasonable and credible estimates of the extent of the phenomenon, in fact, a whole series of estimates about its importance from the point of view of production, employment, the land areas involved and the equipment and infrastructure concerned. Understandable concerns of a political nature and the frequent use of information to support arguments which are basically aimed at persuasion often lead to distortions and the overemphasizing or minimizing of specific factors, or issues may be discussed in a context which is basically — often for no real reason — either optimistic or pessimistic. Again certain important implications may be omitted altogether, or, conversely, exaggerated. This is, by its very nature, a field of research which should logically be organized at supranational level, and it would seem that widespread study of all the different situations can now no longer be delayed.

(ii) In order not to contradict each other, the policies and projects proposed to cope with the manufacturing and employment problems which, initially at least, arise when vast industrial areas and the accompanying equipment and infrastructure are abandoned, should be based on a knowledge of what is being done in similar situations in other countries. By implication, any major project in this area must have required, in its initial stages, a period of research, sometimes very detailed research, into situations which may have been similar. In recent years, Europe has been criss-crossed by study groups attempting

to find out what is happening in the other countries in order to prepare their own proposals for declining industrial areas. It is likely that the need for greater coordination through wider dissemination of knowledge and the promotion of more imaginative ideas as a result of the publication of results obtained in other situations will become more obvious once there is a move away from dealing with albeit important cases individually towards tackling large abandoned areas as a whole.

(iii) Projects prepared in the past have clearly emphasized the important benefits that action in declining industrial areas can have on the environment of whole city and regional areas. It would not seem unreasonable to contrast the excessively casual use of the areas which are becoming available in heavily congested areas with the need to establish more specific objectives on the use of resources so as to improve the environment. Previous projects have shown that, depending on the specific situation, the problems which have to be solved in this connection, e.g. cleaning up soil pollution, may be substantial and once again may require large-scale exchanges of information.

(iv) Finally, it would not seem unreasonable to suggest that declining industrial areas might provide a very clear and explicit opportunity for rethinking the nature of today's living environment. This could then lead to planning and architectural competitions, international schemes, symposiums, seminars and exhibitions, and conferences which are not just restricted to small groups of specialists. In other words, this problem could serve as the opportunity for fundamental changes in the attitudes of society.

PROGETTO BICOCCA-PIRELLI
DISUSED INDUSTRIAL AREAS:
THE « BICOCCA PROJECT » AND OTHER SIMILAR PROJECTS IN EUROPE

International Conference
Brussels, 13 June 1989
Musées Royaux d'Art et d'Histoire
Parc du Cinquantenaire

Opening of the Conference

Carlo RIPA DI MEANA, European Commissioner for the Environment

Gavino MANCA, Managing Director of Industrie Pirelli SpA

Moderator

Bernardo SECCHI

Interventions

Rick BAKKER, Chief of the Town Planning Office, Rotterdam

Edward BENNETT, Director, Commission of the European Communities

Oriol BOHIGAS, Architect, Barcelona

Albert BORE, Chairman, Economic Development Committee, Birmingham

Régis CAILLAU, Deputy Secretary-General, Lille

Sandro GIULIANELLI, Architect, Commission of the European Communities

Vittorio GREGOTTI, Architect, Vienna

Hans HOLLEIN, Architect, Madrid

Eduardo LLEIRA, Architect, Madrid

Pasqual MARAGALL, Mayor of Barcelona

William MILLER, Vice-Chairman, Economic Industrial Development Committee, Glasgow

Marcel SMETS, Architect, Leuven

Walter WENZEL, Executive Officer, CEMR, Paris

THE EUROPEAN STEEL TOWNS
EXISTING TRANSFORMATION PROJECTS
INTERNATIONAL CONGRESS

Terni – Sala Convegni – Ex officine Bosco
1-2 dicembre 1989
Commission of the European Communities
Regione dell'Umbria
Comune di Terni

Friday, 1 December 1989

Opening of works

Welcoming speech by Francesco MANDARINI, President of Umbria Regional Committee

Reports:

The approach of an EEC policy on urban areas
Carlo RIPA DI MEANA, European Commissioner for the Environment

From the overall factory to the post-industrial town
Giacomo PORRAZZINI, Mayor of Terni, European MP

First session

Chairman Vittorio GREGOTTI, Lecturer at Faculty of Architecture, Venice University

The Italian steel towns: city transformations

Genoa: Franco MONTOBBIO, Engineer
Ezio Penna, Architect

Naples: Sandro MONACO, Engineer

Taranto: Vincenzo DE PALMA, Architect

Terni: Aldo TARQUINI, Architect

Reconversion projects for disused industrial areas
Augusto CAGNARDI, Architect

The reindustrialization of IRI areas
Corrado GASCO, Director of environmental and territorial systems at Italimpianti

Round table

Steel towns: How to manage the change
Contributions by:
Salvatore ARNESE, Naples Alderman for Planning
Ferdinando CARRETTA, General Manager at Ital-impianti
Giampaolo FATALE, Umbria Regional Alderman for land management
Carlo FERRONI, General Manager at ANCE
Giorgio ZAPPA, Vice-General Manager at ILVA

Stefano SCIANNAMEO, Terni Alderman for town planning
Valentino STOLA, Taranto Alderman for town planning
Paolo TESSIORE, Genoa Alderman for reindustrialization

Closing remarks

by Vittorio GREGOTTI

Saturday, 2 December 1989

Second session

Chairman Stefano SCIANNAMEO, Terni Alderman for Town Planning

The European steel towns

The Green Paper on the urban environment
Sandro GIULIANELLI, Architect

The Italian steel towns
Bernardo SECCHI, Lecturer at Faculty of Architecture, Venice University

The experience of Bilbao
Eduardo LLEIRA, Lecturer at Faculty of Architecture, Madrid University

The experience of the Ruhr Region
Peter ZLONICKY, Lecturer at Dortmund University

From land programmes to landscape actions
Marco VENTURI, Lecturer at Faculty of Architecture, Venice University

The experience of Liège
Guy MATHOT

The experience of Motherwell
Stanley COOK, Director of Planning Department at Motherwell District Council

The experience of Le Cresout
Clement BERNARD, Director of the Ecomuseum at Le Cresout

Comments by Bernardo SECCHI, Lecturer at Faculty of Architecture, Venice University

The immaterial work: a new development pattern

Presentation of a videocentre project in the ex officine Bosco area
Valter BALLARINI, Architect

Presentation of the High School for Special Materials
Adriano NENZ, Lecturer in industrial chemistry at Perugia University

2

THE PERIPHERY: AN EXPLORATORY STUDY

Synthesis of a seminar in Leuven (26 to 28 October 1989)

Hilde HEYNEN, André LOECKX, Marcel SMETS

Lecturers at the Catholic University of Louvain

1. ELEMENTS OF A TAXONOMY

1.1. Land-use patterns in the periphery

To facilitate our study of the periphery, we have developed a typology of the land-use patterns occurring in the area surrounding urban centres. This typology is not an exhaustive classification: it merely makes an initial morphological and functional distinction between various basic forms of physical development. In practice, many situations in the periphery will be seen to be hybrid forms of several of these types.

1.1.1. Extension in continuity with the urban fabric

The first industrial suburbs were created in the nineteenth century: factories were located on the city outskirts and working-class communities grew up around them. Typical examples are Villeurbane in Lyon, Levallois in Paris, Vilvoorde in Brussels and Kreuzberg in Berlin. These nineteenth-century urban extensions are now characterized by a mixture of older housing stock, largely abandoned factories, warehouses, more recent subsidized housing, etc. These areas are losing their inner cohesion owing to the decline of old-established industries; the workers are no longer employed in the nearby fac-

tories, but commute further afield. Difficult links to the city centre and ageing housing stock have frequently led to social marginalization.

Middle-class suburbs arose early on in Britain. The Victorian suburbs around London experienced their greatest period of growth in the second half of the nineteenth century following the construction of the railways.[1] In other West European countries, the development of residential suburbs really got under way at the turn of the century, and more particularly (owing to the rise in car ownership) after the Second World War. There are now extensive residential areas, varying in social status from lower-middle to upper class, around most European cities.

A special form of urban extension can be found in historic cities, whose centre is morphologically so well-defined and delimited that the urban fabric is unsuited to the construction of large-scale infrastructure installations. Such amenities (stations, storage depots, motorways, etc.) are located on the city outskirts, giving rise to a complementary urban district. In the first instance, this contains a mixture of activities relating to transport and travel: hotels, meeting places, garages, petrol stations, storage areas, etc. In time, owing to its good accessibility and the lack of space in the city centre, this area attracts other functions, such as administrative services, hospitals and shopping centres. A good example of this is Siena, where most of the activity of a modern society takes place in the area outside the city walls, which forms a complement to the well-preserved inner city.
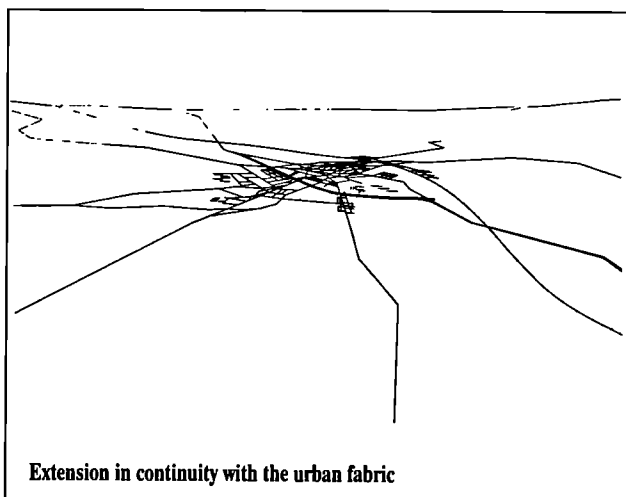
1.1.2. Satellite towns

Satellite towns are urban sprawls, planned or otherwise, situated at some distance from the city centre. There is a physical break between the two built-up areas, but the satellite towns are functionally highly dependent on the centre. Planned satellite towns are frequently designed by the public authorities as large-scale, low-rent housing projects. There was a proliferation of such projects in the post-war period: ambitious projects with thousands of units per site were carried out, frequently in the form of medium- and high-rise blocks, in keeping with CIAM ideas on functional zoning. The French 'grands ensembles' such as Sarcelles, the Bijlmermeer in Amsterdam, the Märkisches Viertel in Berlin, among many others, are perhaps the most eloquent examples. The drawbacks of these projects are, however, well known: inadequate amenities, high maintenance costs, an unpleasant, monotonous living environment and a lack of common identity with the city. They can scarcely be said to be integrated into an urban system.

The emergence of a large number of settlements in an existing centre at some distance from a primary centre results in the creation of a second type of satellite, the commuter town. Many small towns and villages in the vicinity of a large centre, such as the communities along the Brussels-Charleroi railway, have grown significantly by just such a process. Their character was substantially transformed as a result: from relatively self-contained communities to dependent dormitory towns. If

Extension in continuity with the urban fabric

Satellite towns
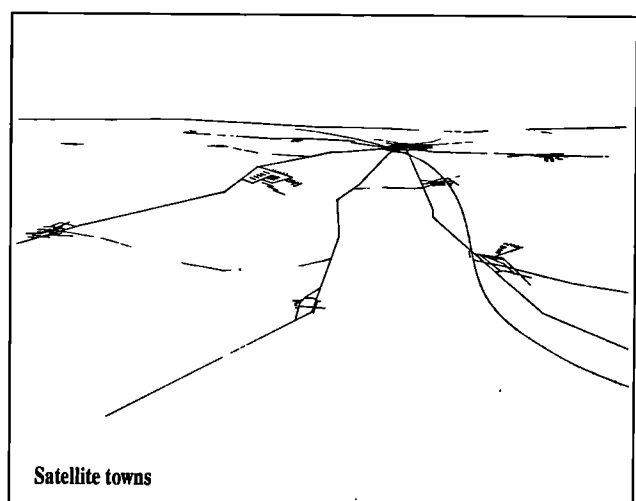
the commuter movement subsides for any reason, problems may arise.

1.1.3. Linear developments

Ribbon development has long been a phenomenon in high-density areas with a poorly-defined planning tradition. This consists of irregular strips of housing and businesses along highways and major rural roads.

A recent development is commercial strips. More or less large-scale commercial enterprises (hypermarkets, furniture centres, garden centres, textile stores, shoe shops, garages, etc.) are setting up on sites alongside major roads. Industrial and administrative complexes are following this trend. This is giving rise to a special type of micro-environment. The road no longer has the sole function of linking towns, but increasingly generates urban activities. As through-traffic is increasingly hampered by users of the adjacent amenities, local and longer-distance traffic increasingly come into conflict. This can result in the necessity to build more roads (e.g. a parallel motorway).

1.1.4. Nebulae and networks

More and more rural areas, including those not immediately adjacent to an urban centre, are losing their rural character as a consequence of counter-urbanization. They are being gradually eroded by urban sprawl: privately built houses, residential services, craft industries, small industrial estates. Agri-cultural areas are being broken up by such developments. The resulting nebulae are fragmented areas, disjointed, indefinable conglomerates where the most diverse land-use elements exist side-by-side, with no link to each other or a greater whole. These fuzzy, inter-urban areas are formless and indeterminate, for lack of a coherent structure and a clear identity.

However, such developments can also give rise to network configurations: polynuclear structures with activities concentrated at well-defined points which lend a structure to their surroundings.

1.1.5. New poles of attraction

Major infrastructure nodal points — motorway junctions, airports, major rail terminals, etc. — result in the development of specific amenities. Hotels, congress centres, exhibition halls, shopping centres and car-hire firms, etc. are attracted to these locations. This is tantamount to the arise of a secondary centre fulfilling a number of complementary functions in respect of the inner city (international links, facilities for mass events), but which can also enter into strong competition with it. There are likely to be similar developments around the site of mammoth pleasure parks which are expected to attract millions of visitors.

1.2. Regional structures

The nature of physical development in the periphery also depends on the regional structure of the surrounding area. In

Linear developments

Nebulae
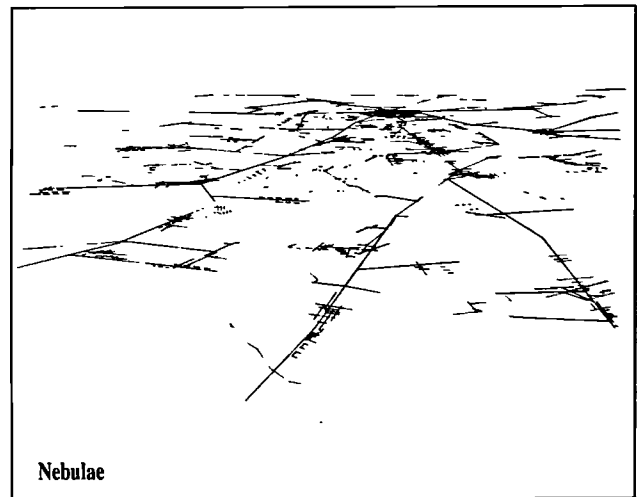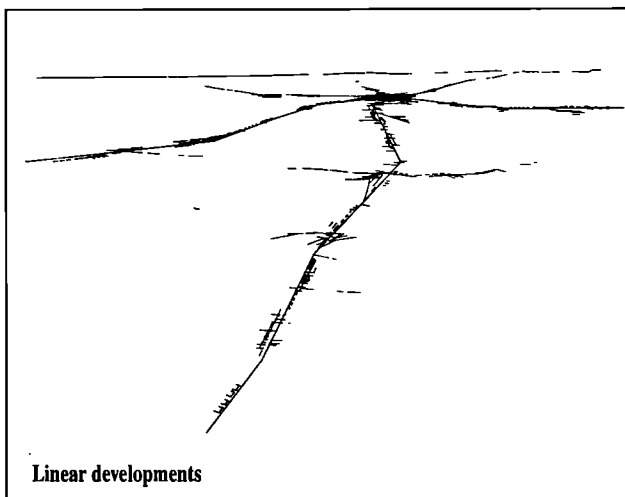
areas with a traditional structure, based on small, simple town centres surrounded by countryside, a clear distinction can be made between the (urban) centre and (urban) periphery.

However, large parts of Western Europe form part of metropolitan systems and no longer correspond to this traditional structure. Metropolises differ from small towns in their complexity, population, heterogeneity, the hustle and bustle of urban life, etc.[2] There are two different types of metropolitan system in Europe. **Spiderweb metropolises** extend concentrically around a dominant (capital) city of the first order. Examples are Paris, Rome, Athens and Madrid. **Network metropolises** are based on a network structure of different towns. They can be found, for instance, in the UK (Greater London, Manchester, Leeds), the Netherlands (the Randstad), Belgium (the Brussels-Ghent-Antwerp triangle) and Germany (the Ruhr-Rhine area and the Upper Rhine Valley).

In the spiderweb metropolis the core city is the physical centre of a radial system of links. It is also the centre of power and influence, the place where decisions are taken and where cultural life takes place. The problem of the periphery in this case concerns above all a lack of equality — in social and town-planning terms — between the centre and the surrounding area.

The matter is more complex in the case of network metropolises. The Dutch Randstad, for example, does not have a distinct centre. The physical structure of this metropolis is determined by a ring of cities (Rotterdam, The Hague,

Amsterdam, Utrecht) and a network of their respective interconnections. The dichotomy between the centre and the periphery is no longer evident from the map of such a structure. The structure is multilayered, with various centres and sub-centres, and the peripheral zones in between frequently cannot be attributed to a specific centre. The interurban periphery has, as it were, acquired its own centre and autonomy. Its dependence on a well-defined urban centre has declined, and the peripheral location may amount to a central position with regard to several towns. On the scale of the State as a whole, such a multiple super-centre sometimes results in polarization of a new periphery in the areas which are outside the bounds of the primary network, and thus excluded from the centrality generated by it.

2. CHARACTERISTICS AND PROBLEMS

2.1. Urbanism without an urban centre

The periphery is generally characterized by the diffuse presence of urban functions, combined with the absence of a coherent urban structure which could give the various elements a physical cohesion and unity.

The traditional European city is a conglomerate of fragments of different origin.[3] The enforced confrontation of divergent fragments within a constraining morphological framework re-

Networks

New poles of attraction
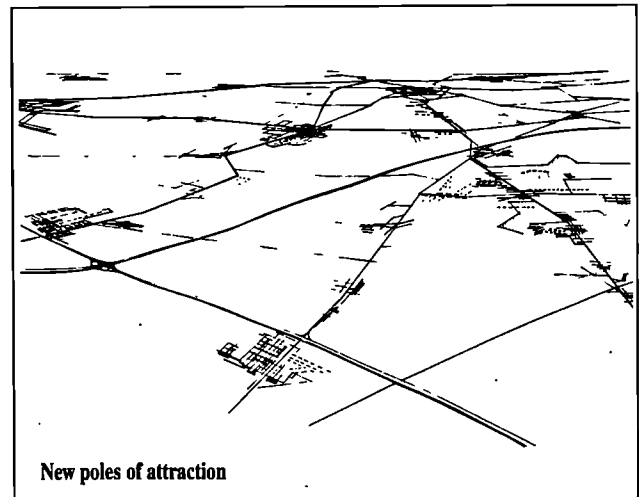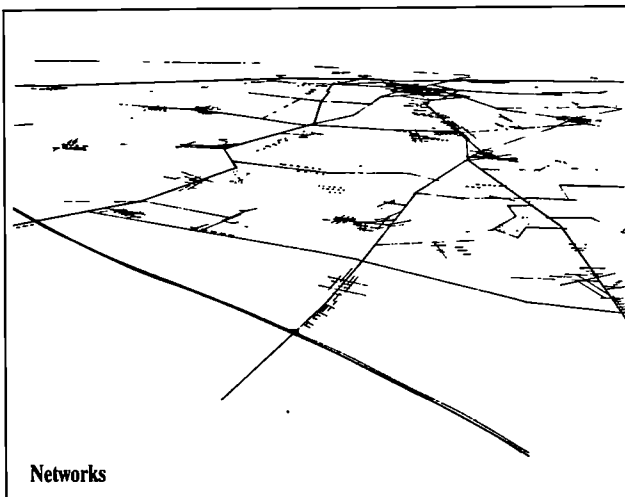
sults in a complexity and intensity which confers a marked added value to the whole. By bringing heterogeneous elements into contact with each other in an umbrella structure, the city creates a new entity, within which the elements enter into new and unexpected relationships with each other. As a result of the interactions between different fragments, the city forms a whole that is more than the sum of its constituent parts.

There is, of course, also a diversity of fragments in the urban periphery corresponding to entities of different types (enterprises, commercial, centres, residential areas, agricultural land, etc.), but these divergent fragments do not interact in any way. They coexist independently. The strong morphological structure created by a true urban association is lacking. In addition, the historical stratification characteristic of the city is also much less marked; it is an early urbanization phase, the new fragments are superimposed on a rural structure in which the traces of a complex history are much less in evidence. In the periphery, the whole is therefore less than the sum of its parts.

2.2. A new type of centrality

Centrality concerns accessibility and excellent links. These qualities are not restricted to the city centre, but also characterize the vicinity of transport nodal points or airports. As journey time is no longer determined by the physical distance, the traditional correspondence between accessibility and proximity is no longer wholly valid. Centrality and concentration in the inner city have become divergent concepts. A new form of centrality is developing, based on mobility rather than proximity.

Continuous urban extensions and satellite towns are land-use models based on the old concept of centrality as being linked to the centre: they remain subordinate to the core city and do not challenge its dominance. Ribbon developments and nebulae are developments which undermine the primary role and innate centrality of the old centre. They are a tentative indication of the emergence of a different type of centrality, but lack the substance to generate vital elements of centrality without outside stimuli. Strips and networks are already clear (although not necessarily unproblematic) manifestations of a new centrality.

This evolution is accompanied by ruptures and equivocal situations. The influence of the old centre is eroded, while the new elements of centrality have not yet crystallized out in a suitable form.

2.3. Peripheral condition — peripheral location

Where 'centrality' and 'centre' are no longer synonymous, a distinction has to be made between 'peripheral location' and 'peripheral condition'. A peripheral location is a location at a certain distance from an urban centre. A peripheral condition is characterized by the absence of an orientational, complementary centrality. This can be the result of the loss of an existing centre, or due to the marginalization of a given area with regard to the emergence of a new, dominant centre.

In the latter case, the periphery is practically the 'backyard' of the city, which is overshadowed by the more prestigious front view, but its fate and that of the city are nevertheless closely linked. Michel Cantal-Dupart refers to the Paris conurbation as 'la ville à deux vitesses' (a two-speed city).[4] Paris, he says, really consists of two cities. The first city is made up of Paris, within the ring motorway *périphérique* with extensions to the airport and villa areas. This is what is meant by all references — architectural, cultural, political — to Paris. However, the second city, the city of the *banlieues*, the city of the periphery, is not implicated in the central life of the first, it does not participate in the organization of authority, or the development of cultural life. The second city is radically cut off from this centrality. Irrespective of the close link apparently created by the system of radial roads, there is nothing like real coherence between the social reality of the central city and that of the periphery. The first and second city are totally out of step. For many residents of the suburbs, central Paris is almost as if it were on a different planet: it is remote from their daily life and they do not feel in any way involved in events there. Peripheral location and peripheral condition coincide in these suburbs; they are not merely cut off from the centre, but also have a secondary status in other respects.

The secondary status inherent in a peripheral condition can be expressed in various ways. First of all, there is the visual manifestation of peripheral settings: incoherence, chaos and arbitrariness are the external characteristics. A second form of secondariness concerns the infrastructure: lack of good connections and adequate facilities are symptoms of a sub-

ordinate position on this level. Finally, the subordination can also result in socio-economic marginalization, expressed in high unemployment and effective lack of opportunity of the population concerned.

These three types of secondary status are not necessarily interlinked. However, most peripheral locations are typically characterized by at least one of these forms of secondary importance: they are unstructured, poorly developed or economically disadvantaged. The worst case is when all three evils occur together.

2.4. Lack of planning strategies

While the inner city usually benefits from circumspect, well-planned management owing to its historical heritage, the periphery is exposed to unfettered development and unchallenged expansion. Conflicting claims to space vie with each other bitterly here. According to Taverne, the periphery is the place where existing town and country planning regulations, familiar planning concepts and urban design principles have broken down. The fringes of the major cities are laboratories in the true sense of the word, in which banality, randomness and chaos have reasserted themselves.[5]

Architecture and town planning have something of a blind spot where the periphery is concerned. While there is a long tradition of planning for urban extensions and new towns, its point of departure is the town spreading out into more or less virgin territory. The existing periphery or urban fringe does not figure in this scheme of things. To all intents and purposes, the urban fringe is unplanned. It is an accumulation of speculative developments, partial implementation of planned extensions, *ad hoc* utilization of land becoming available, etc. An integrated plan, a medium or long-term strategy, is lacking, or — at best — is subject to political uncertainties.

Another structural problem is that of responsibility for planning. A characteristic feature of the periphery is that it extends over the territory of different local authorities. The consequence of these administrative and political borders is that it is difficult to develop a consistent planning policy for an urban region comprising both a centre and a periphery.

At the same time, the planning tools do not appear suited to tackle the problems of the periphery with both flexibility and firm direction. Even in a country such as the Netherlands with

its established planning tradition, existing planning forms are inadequate for the urban fringe. Development plans at local level involve lengthy procedures and so are difficult to effect. They are not sufficiently flexible to take account of the rapid changes in requirements and land use typical of a peripheral area undergoing development. Regional plans, for their part, are too general to give direction to specific planning and management questions. Other planning options (landscape structure plans, regional development plans, etc.) are being considered in this hiatus between global regional plan and local development plan, but substantial progress has not yet been made.[6] An architectonic view of peripheral development is, moreover, virtually non-existent.

2.5. General problem

The present-day counter-urbanization trend is causing the peripheral condition to be generalized. In a context in which urban centres are being undermined and potential new elements of centrality are still *in statu nascendi*, secondariness is becoming a prevailing condition. Such a development has detrimental effects on three levels.

2.5.1. Local level

At the level of the specific environment, the specific neighbourhood, there is a lack of a coherent physical structure, with an inadequate town planning and architectural quality and in some cases marginalization. In the older peripheral areas (the nineteenth-century industrial suburbs, for example), this lack of coherence is the result of inadequate links, economic decline, dereliction and lack of renewal. The large housing estates still suffer from isolation and monofunctionality. The lack of cohesion in the more recent nebulae is a result of the growth process itself, which is fuelled by speculation and un-coordinated, *ad hoc* land-use schemes, and of the supremacy of the motor car. The extensions are therefore illogical, faceless and inefficient. They are not planned as integrated parts of a whole, but come about at random. New business premises and shops in the strip developments along major roads are geared purely to the requirements of accessibility, visibility and room for expansion. Their exclusive concentration on a motorized clientele reduces open space to a transit corridor.

2.5.2. Urban system

At the level of the urban system as a whole, the shift in the focus of growth to the periphery has adverse consequences for the viability of the centre. Investments in office blocks or shopping centres in the periphery are absorbing capital that is no longer available to revitalize the inner city. Decline of impoverished subareas, obsolescent industrial estates and surrounding residential fabric, for example, often go hand-in-hand with large-scale expansion in the periphery. This results in a very inefficient utilization of available land, buildings and infrastructure. Within a given urban area, locations with good links are generally the first to attract investments. There is also often a very uneven distribution of positive and negative developments in and around the city.

2.5.3. Society in general

At the regional, macroeconomic and general social level, decentralization and the development of mobility initially have a negative impact on the environment. The area of farmland and natural landscape is shrinking, not only as a result of the urban extensions themselves, but also of the growing requirement for an increasingly dense infrastructure network. The growth in (auto)mobility creates considerable problems: high energy costs, high investment in roadbuilding, air pollution and harmful depositions on the soil, traffic congestion and clogging-up of the roads, disadvantaging of non-car owners, etc.

The dispersed nature of urban elements also has adverse social implications. The loss of the old centre undermines the identity of the city. There is a loss of characteristic physical qualities, and thus of scope for identification and points of reference. This makes it difficult to establish a sense of physical roots and community spirit, thus intensifying social marginalization and disintegration trends, as not everybody has the material and socio-cultural capacity to adapt to the functioning of a new centre. The resulting vacuum can be a factor in the process that gives birth to extreme forms of identification, which occasionally assume disastrous proportions (e.g. recent events in large sports stadiums).

3. CASE STUDIES

The purpose of the case studies is to give concrete examples of approaches to the problem of the periphery. Three cases are considered: Siena, Paris and the Dutch Randstad. These concern respectively the periphery of a small city, a spiderweb metropolis and a network metropolis.

3.1. Siena: a medieval city and its modern counterpart

The famous walled inner city determines the image of Siena and its attraction for tourists. However, modern urban life mainly takes place in the city outside the walls, where a wide range of functions are concentrated. This second city is extremely heterogeneous, it is the result of diverse activities such as the construction of a rail network and station, the connection to motorways, the construction of industrial and commercial premises, housing, etc. This complementary urban district is essential to the functioning of Siena as an urban system, but is not physically integrated into a global, coherent structure.

The structure planned for Siena by Bernardo Secchi and colleagues[7] is primarily designed to bring the whole city into clear focus. The inner city is characterized by the coherent structure of its public areas, which show an unbroken historical evolution that gives the city its identity. The outer city lacks a comparable basis. The functional ideas that have been implemented have not been successful in giving the public sphere shape and a distinctive character. The chaotic picture it presents illustrates the peripheral condition of the outer area.

Secchi's plan is designed to set in train a process of urban upgrading to overcome this secondary condition. The establishment of public services, which space constraints are driving out of the inner city, provides the required opportunity. Ideas are also being formulated on redeveloping and regenerating the post-war residential areas. The plan also focuses on typical forms of land use in the periphery, such as depots, railway yards, refuse tips and scrapyards. According to Secchi, these blots on the landscape, because of the vast amount of space they consume, cry out for the development of a new, town-planning and architectural concept. His plan finally combines these issues with that of completion of the rail and motorway slip road infrastructure.

The eastern transport axis, around which the outer city has grown up, is the object of a plan setting out the details of the location and insertion of projects which will alter the structure

of this area in future. The projects are separately developed and illustrated in a document that sets out the changes to be made to public sites and how the area in question is to relate to the rest of the city. In other words, the physical planning aspect is not to be left exclusively to private developers. It is included in a plan, the object of which is to draw up realistic proposals for the possible design and use of the existing environment.

3.2. Greater Paris:
the periphery in a spiderweb metropolis

Paris is an eloquent example of a spiderweb metropolis. The French capital is the centre of a radioconcentric communicating system in which the ring motorway *périphérique* is the divide — in morphological and administrative terms — between Paris proper and its ring of suburbs.

Awareness of the growing importance of the periphery was stimulated by the 'Banlieues 89' project, which was launched in 1983 by Roland Castro and Michel Cantal-Dupart. This project was designed to focus attention on the special problems of the suburbs. A separate study group, *Le Grand Paris*, was set up to analyse and draw up proposals for the suburbs which, in the 'two-speed Paris', are relegated to a peripheral existence.[8] The group advances a number of ideas which should allow the periphery to free itself from the centralism of Paris. The transposition idea, for example, envisages every point in the Paris conurbation being able to function as a central observation point. The notion is reflected in the system applied to map the suburbs. A neutral grid with squares of 1 km^2 is used. The systematic examination of these grid squares concentrates, among other things, on identifying magic points, potentially vigorous urban elements which could provide an identity and a centre to the surrounding area.

The results of this study are registered on 28 maps, which together constitute an inventory of characteristic geographical, social, administrative and architectural elements of the Paris periphery. The project proposals focus above all on good transport links, the reintegration in the urban fabric of diffuse intermediate areas and poorly used green spaces, and the creation of identification points and urban experiences. The adverse effects of a peripheral condition are thus mitigated in two ways: by making the primary centre — the City of Paris —

more easily accessible and by consolidating secondary elements of centrality which can generate potential identification points and further development opportunities.

In this connection, the 75021 group maintains that it is time to stop imagining Paris as a clearly defined city, and consider it instead as a territory that extends much further. Paris is not a municipal city, but a territorial city which also includes Versailles and the new Disneyworld. In keeping with this vision, the group advocates structuring the communicating system differently. The growth of the city has reached a critical point where the scope for optimum functioning of the radial web is exhausted. Further additions and extensions must be based on a grid system offering better guarantees for intercommunication and the accessibility of the peripheral areas. The negative effects of the spiderweb development pattern must be countered by intensive development of new energy poles in the periphery (airports, touristic attractions, high-speed rail terminals, etc.).[9] In other words, there are also moves afoot in Paris to introduce a new type of centrality. However, it does not look for the time being as if this new centrality will fundamentally change the age-old predominance of the centre.

3.3. Southern outskirts of The Hague:
giving shape to an interurban zone
in a network metropolis

Since Peter Hall in *The world cities* presented the Dutch Randstad alongside large cities such as New York and Tokyo,[10] this cluster of cities is regarded as the prototype of a network metropolis. However, the question of its identity is frequently posed. J. Nycolaas thought that the answer should be sought in the emergence of a homogeneous periphery. He suggested that the look-alike periphery constituted the lynchpin, the common face, of the otherwise so different cities in the Randstad.[11]

In a town planning study, Willem-Jam Neutelings refers to the Randstad as a tapestry of physical-programmatic fragments in which the distinction between town and country no longer applies.[12] The tapestry structure corresponds to the new centrality which is dominant in the network. The highly ramified system of communications forms the basis for a set of heterogeneous developments. The extreme mobility of the population ensures mutual communication. The tapestry metropolis is a continuous landscape in Neutelings' eyes — every

location is integrated with a specific programme and a specific structural pattern. The fragments of the tapestry interact in a changing mutual balance, with no clear centre, like stars in the universe.

According to Neutelings, the future development of areas in the Randstad must follow on from this reality. The tapestry itself must constitute the development model, that of a field undergoing permanent transformation. It is crucial to the orderly progression of this development that new schemes are integrated in the existing field of forces, that the equilibrium in the tapestry as a whole is improved. That is the aim of his transformation model for the southern fringe of The Hague (the Zuidrand), an open area of limited extent between The Hague and Delft. The Zuidrand is criss-crossed by motorways providing excellent links to Rotterdam, Amsterdam and Utrecht. At present, office and business blocks are being built on sites in the immediate vicinity of these roads. Neutelings presents measures designed to boost the amenity value of the area. Optimization of the transport system (both individual and public transport) must enhance the accessibility of all the fragments. Various important landscape elements (woodlands, waterbodies, old country estates, etc.) will be consolidated and given new functions. New housing models on selected sites are being contemplated, while the area around the motorway is reserved for the development of large-scale projects. The nodal points between motorway and (improved) urban highways are eminently suited for the location of massive commercial centres, high-rise office blocks, business premises, shops and apartments. All these measures will improve the cohesiveness of the area as a whole, give architectural shape to selected sites and intensify land use. The existing fragmentation, which lacks vitality, will be transformed through the input of new activities and new bonds to a mosaic which attempts to create urban synergy effects.

Neutelings' town planning study examines the scope for making existing trends acting on the new elements of centrality converge to form a new urban environment. In other words, confusion and non-regulation is to be transformed into diversity and choice.

3.4. Conclusion: key issues in the case studies

It is clear from the above that there is no patent recipe for management of the periphery, as the situation is so multi-

faceted. Differences in regional structure, socio-economic development, planning tradition, legislation, etc. mean that the periphery poses different problems in different contexts. Each situation calls for the appropriate approach.

However, there is a great deal of common ground between the approaches discussed, however great the differences in the actual problems. It is emphasized in all three cases that the periphery must be seen as existing in its own right. Secchi, Cantal-Dupart and Neutelings are in agreement that the proposed measures must be based on a thorough analysis of the existing situation on the ground. This analysis, moreover, is not to be conducted from the standpoint of the centre, but will study the periphery on its own terms, as a specific physical condition.

The architectural plan plays a key role in this. It helps formulate a complex problem and highlights specific options that can develop into crystallization points for a new commitment on the part of the authorities, the general public and investors. It provides a point of departure for a centrality of a new type and for the creation of new identification possibilities.

These insights represent important achievements for what Secchi calls third-generation plans. Today's urban problems must be comprehended in totally different terms from the reconstruction problems of the period following World War II (the first generation) or the question of unlimited expansion in the 1960s (the second generation). The essential goal in the present-day context is to mitigate the negative effects of counter-urbanization, both in the urban centre and in the periphery.

The problem of the periphery is also bound up with the issue of the quality and structure of public spaces. There is primarily a need for new physical planning strategies to channel existing trends and conflicts of interests in such a way that the intrinsic spatial and functional possibilities are optimally used. For this purpose, the available planning tools must be supplemented, town planning vocabulary enriched and applied in new ways.

The organization and integration of transport is a recurring theme in the three case studies. The objective in Siena is to integrate infrastructure — stations, railways, motorways, parking spaces, storage areas, etc. — into a territorial unit and thus to involve them architecturally in the shaping of an urban

area. In Paris, the radioconcentric system is being optimized, particularly with regard to the underground and RER system, and new ways are being sought of speeding up communications in the region as a whole. This line of thought rightly regards the transfer points between the different transport systems (airport and high-speed rail terminal, for example) as the nucleus of a new centrality, Neutelings too, gives wide consideration to mobility in his scheme for The Hague. He envisages completion of the motorway network and the introduction of an express tram system to facilitate rapid transit between the different parts of the tapestry.

4. KEY ISSUES FOR MANAGEMENT

A coordinated town and country planning system is greatly hampered by political decentralization and fragmentation of authority. The periphery is an eloquent example of the need to consider various developments in their overall context. If the problems are to be effectively tackled, several management options must be integrated. At all events, it will be necessary to coordinate the various sectors which contribute to lopsided development (transport, housing, agriculture, land development, economic expansion, industrial restructuring, cultural and recreational policy, etc.).

In practically all European countries, the periphery is growing systematically, and economic activity in many of them is increasingly relocating to this area. However, little has been done to develop a matching planning policy for the periphery. While the counter-urbanization trend described is increasingly leading to disintegration of the existing urban structure, reflection on the consequences is only just getting under way. A set of tools to satisfy the requirements of economic growth while ensuring the necessary transparency and flexibility, and at the same time channelling these developments along acceptable social and development planning lines, is totally lacking. Even attempts to focus attention on such a need, e.g. 'Banlieues 89', have not yet been successful.

This gap between free-market mechanisms and appropriate regulatory control is not really surprising. There has always been a considerable time lag in physical planning between the emergence of a problem and the institutionalization of the

means to steer the observed developments in a direction acceptable to society as a whole. In the present case, however, it is crucial to cut short this natural, traditional inertia as far as possible. The developments themselves are proceeding at a very rapid pace as a result of growing mobility and the introduction of new communication technologies. The continuing erosion of the urban centres, the generalization of a peripheral condition and the increasing marginalization of secondary areas are having predictable effects. A redirection of policy is urgently required in order to halt a further escalation of these adverse effects.

Fringe areas with a peripheral status can themselves develop initiatives to a limited extent to improve the quality of their own public areas. Renovation of characteristic groups of buildings in impoverished areas can provide a basis for further developments and help attract private investors. Joint action at intercommunal level between the core city and its peripheral communities and between the communities themselves is called for. This alone can avert dislocation arising from uneven external stimuli. Such joint action associations will seldom come about spontaneously owing to the sometimes conflicting interests of the communities concerned. It is therefore to be recommended that the national authority should bring its influence to bear.

Programmes should be developed at national level for the areas in which a peripheral condition is reflected in a downward spiral of degradation and neglect, in order to make the location attractive again to residents and investors through a combination of measures (retraining, new jobs, improved communications, enhanced structural qualities, promotion of individual renewal projects, etc.). The suitability of such an approach can be studied with the aid of cleverly selected, well-prepared pilot schemes.

However, it is important to set clear priorities and achieve the involvement of the private sector. The present austerity in the public finance sector leaves no room for improvization; properly considered, target-oriented and efficient action is the order of the day.

The European Community can act as a catalyst here. As an umbrella body, it is excellently placed to illuminate the complex interrelationships between different areas of concern. It can initiate studies designed to situate the problem more pre-

cisely and to investigate the differences between Member States. By facilitating exchanges of information between experts, it can promote consideration of suitable instruments. It can fulfil a pioneer function by supporting decentralized, local initiatives. A large-scale awareness campaign (on the lines of European Heritage Year) can focus the attention of the national authorities on the problems.

It will depend on the decisiveness of the approach whether the overall development continues to follow the path of counter-urbanization, or whether this trend can be reversed. In the long term, however, reurbanization appears to be the only way of combining a socially balanced, wholesome distribution of well-being with a richness of structural qualities and environmental protection.

[1] F.M.L. Thompson (Ed.), *The rise of suburbia*, Leicester University Press, 1982

[2] J. Guillerme, 'The etymological destiny of the term metropolis', in G. Teyssot, *Beyond the city, the metropolis*, Electa, Milan, 1988, pp. 73-75.

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FRAGMENTED SPACES

Colloquium architectuur K.U. Leuven
26-27-28 oktober 1989
Leuven
Auditorium Arenberginstituut,
Naamsestraat 96, 3000 Leuven

Commission of the European Communities
European Commissioner for the Environment:
CARLO RIPA DI MEANA   ⁓
Katholieke Universiteit Leuven
Fakulteit toegepaste wetenschappen
Dep. architectuur, stedebouw en ruimtelijke
ordening
Vakgroep theorie en geschiedenis

26 oktober

    R. DILLEMANS (KUL)
    S. GIULIANELLI (EEG)
    A. LOECKX (Leuven)
    F. NEUMEYER (Dortmund)
    C. CONFORTI (Florence)
    L. VOYÉ (Louvain-la-Neuve)
    M. GANDELSONAS (New York)

27 oktober

    H. HEYNEN (Leuven)
    B. COLOMINA (Princeton)
    B. SECCHI (Milan)
    J. BUSQUETS (Barcelona)
    F. CONFINO (Nîmes)
    P. NICOLIN (Milan)

28 oktober

    M. CHANTAL-DUPART (Paris)
    P. WILSON (Londen)
    H. KOLHOFF (Rotterdam)
    R. KOOLHAAS (Rotterdam)
    M. SMETS (Leuven)

3

MAN AND THE CITY: URBAN DESIGN

Synthesis of a seminar in Rome (28 and 29 November 1989)

Renato CECILIA

Director of the revue AU-Arredo Urbano

PREMISE

An International Conference on Green Areas and Urban Design took place in Rome in the area inside the Victor Emmanuel monument on Piazza Venezia on 28 and 29 November 1989. This event, which was organized by the Journal *AU — Arredo Urbano* under the patronage of the Commission of the European Communities and with the support of the Italian Ministry of Agriculture and Forestry, included an exhibition which, passing through the imposing area inside the Victor Emmanuel monument, led up to the conference hall.

The topical interest in the subjects discussed was underlined by the outcome of the event: the Minister for Urban Areas,

Mr Carmelo Conte, stated that he intended to introduce a national law, with the respective financing, in favour of green areas and urban design in Italian towns and cities preceded by the promulgation of a 'Charter of Rights of Towns and Cities'. The reports and projects presented by experts from abroad were highly illuminating.

In terms of methodology, significant public interest was aroused by the reports of Steve Ankers and Brian Smith and by the philosophical, landscapist approach of Michel Corajoud (Director of the Versailles School of Landscaping). In terms of strategy and management, on the other hand, a good deal of attention was claimed by the Barcelona project presented by Josep Acebillo (Director of the Barcelona Institute of Town Planning), who illustrated some of the many innovative schemes undertaken in the 1980s.

1. URBAN ENVIRONMENT IN A CRISIS

The urban environment is seen less and less as being capable of satisfying the primary physical and psychological needs of the individual. Particularly unsatisfactory are the peripheral areas (suburbs) that sprang up in the reconstruction phase after the Second World War. But the real crisis is in the model of the city itself, which no longer provides solutions to the problems of habitability and functionality that are gradually emerging.

This is a problem which essentially concerns all European towns and cities and it has many causes:

(i) The results of planning in years gone by are there for all to see: pollution, a lack of squares, parks, car parks, etc. Traffic is a law unto itself: complete saturation because of the car, which despite its undoubted merits, has gradually taken over the entire urban environment, suffocating all kinds of functions or needs, without ever reaching levels of satisfactory functionality.

(ii) The general structural decay, or the progressive breakdown of the healthy environment; and the decline in formal aspects and dignity, which are not irrelevant, but are in fact the real determining factors behind whether the individual uses one particular urban element rather than another. Public places are used as a future of their attractiveness.

(iii) There is a confusion of principles and objectives in the current architectural style when it comes to urban planning. That is to say, there are no reference points or lines of action designed to put things right. Orthodox town planning looks at how to give concrete shape to plans and how to correct errors of the past (re-urbanization).

(iv) The environment, meaning not only a part of the natural way of things but above all a systematic unit of nature, culture and change, now constitutes a real social demand requiring, in cities, high standards in the shape and form of places or areas and objects connected with them.

Against this background European architecture must analyse the city as an entity, theoretically at first, but also pragmatically. The first, pressing problem is to start immediately on the sorting-out of existing problem situations, by way of strategic measures such as pedestrian precincts in town centres, car parks, urban greenery (parks, tree-lined streets, green belts, cycle paths, etc.). In essence, however, there is the greater theoretical problem of what new approaches to adopt or explore in order to propose new methods of planning urban development; or how to respond to urban demand, which, met only by the centre, is the prime cause of the single-centre syndrome of current structures.

The new idea put forward to set things in motion in this framework is the real and immediate (and attractive) one of detailed design of public space: urban design. In other words, the current debate has illustrated the value of the physical, the visible and perceivable. Great attention focuses on space left after building as the primary environment not only in a functional sense but also in terms of attachment. Urban design is thus seen as the creation of common space and the regulator of each and every aspect that forms part of its make-up; an instrument for coordinating the major problems of functionality through greater attention to habitability.

2. CITY AND THE CITIZEN

The first problem to be analysed is the reaction of the individual to the urban environment.

Numerous research projects were carried out in the 1960s and 1970s, including perceptual research by Lynch and socio-psychological work by the Frankfurt School. One of the most important results has been to try and overcome the functionalist culture, accused, among other things, of being responsible for having theorized the elimination of every emotional component from the physical environment. The ideology of naked functionality is closely followed by the anaesthetization of individuals' reactions and complete emotional isolation from the space in which they live.

This environment devoid of emotion becomes a place fraught with frustration: inhospitable space, as Mitscherlich called it.

A psychological approach to the problem of urban conflict induced by a declining quality in the environment was put forward by Lorenzer, who observed that exclusive functionality repelled people and compromised their relations with others.

Emotional isolation produces a gradually diminishing attachment to one's own environment and provokes, at local level, a reticence to communicate and the disappearance of the sense of community. Lorenzer thus hypothesizes that an in-

hospitable, monotonous and squalid physical environment forces the individual to assume a defensive attitude. On the other hand, he sees an environment constructed to meet all needs as making for an open attitude and a positive predisposition to physical and human surroundings. The problem is, of course, more general and concerns far more than behavioural psychology: it involves the civic and political awareness of the individual, solutions to which are beyond the realm of architects, town planners and sociologists. None the less, it must be stressed that the breakdown in the organization of urban areas and the shortcomings of planning are part of the general diminution in public awareness and hence, as such, justify the search for specific solutions.

We therefore need to amplify the concept of urban functionality. This has been the way of rational architecture and town planning since the 1960s (Modern Movement, Charter of Athens, etc.). Basically, this approach, which, in the final analysis, concerns town planning more than architecture, operates on two principal planes.

(i)   The first immediately apportions blame for having eliminated representativeness from the public sphere and any other personal and emotional characteristics.

(ii)   The second sees the rational city as the application of mechanistic laws of growth juxtaposing divided and specialized units without any respect for the environmental context and without the use of formal intervention (the contrast between Otto Wagner and Camillo Sitte).

Analyses of this type have illustrated one very important factor: the refusal of the contemporary city to carry on with the way its space is structured, other than functionally, and the rigidity of the type-subdivisions.

The most evident result of this approach has been the lack of interest in 'connecting areas' which physically constitute the void between building complexes. A serious fault of the rationalistic city is to have left these voids as simple voids, space left, if anything, to perform the function of simple vehicle passage.

3. CITY AND ARCHITECTURE

This is thus how designers and administrators must approach the construction and management of urban public areas. They

must determine what instruments will express, in addition to the functional context, the upgrading and respect of the environment and what symbolic content will encourage the emotional participation of individuals in the collective environment. The first area is the re-urbanization of what is already there.

The cause of the current crisis is without doubt the present architectural approach, which has obviously not yet come up with valid alternatives to the basic idea of a modern city. The city model proposed by the Charter of Athens has been behind the planning of the last half century and has imposed itself above all through historic needs to reconstruct, focusing on quantity rather than quality and working on elementary principles of functionality and residential aspects. The cultural value of the European city, based on symbolic values of the historic city has been ignored.

The dissatisfaction with this development model, which is now widespread, stems from the points set out above. The functional structure cannot be the only backbone of the urban environment.

The city is also expression, imagery and symbolism. How can this general practice, this prime generator of the suburbs be countered? How can the fabric of the suburbs be raised to the same level of respect as other places?

The problem then shifts to the definition of urban form in relation to man and the environment. The way town planning has been going, the shape and form of the city is coming to depend exclusively on a rationalistic bureaucratic planning function.

Hopes are pinned on a plan which, however correct and even if backed by rigid implementing standards, can never express a form or have control of it since it has never designed it. We must look at the details and harmonize the various needs, we must plan the physical side of public space and pay attention to quality.

In 'An introduction to urban design' Jonathan Barnett defines the subject as follows: Urban design is the generally accepted term for the process which determines the physical aspects of the growth of a city, its conservation and its changes. Despite all efforts, he adds, we have not yet found a way of replacing the term urban design to define all these interests.

The fundamental idea is thus to transform public space from simple functional interconnection into a finished connection structure. This is an area which has now gone beyond the realms of experimentation or applying proven instruments to solve problems. Urban design is thus the basis for urban effect and should break this dichotomy of town planning schemes and architecture action.

The importance of its role as a point of juxtaposition between the technical aspects of management (transport, infrastructure, services, etc.) and the growing demand for quality (green belts, pedestrian precincts, etc.) is beyond dispute. This quality will obviously be hard to obtain in partial processes (only buildings, only roads, etc.), which generate anonymous and shantytown areas. It can only be found in a vision of design which grades and organizes the various functions without placing any one demand above the others.

4. THE NEEDS OF THE URBAN ENVIRONMENT

There is therefore growing pressure at European level to safeguard the city by means of conversion schemes and by bringing about a change in the growth model away from the model of the modern city.

Leaving aside the question of building structure, and considering in detail the scope for action, it is necessary to repeat that this cannot be excluded dogmatically from the complex multiplicity of social relations but must be taken into account in relation to the needs of functionality.

The various direct improvement schemes can be classified as follows:

(i) Control of air pollution, to be achieved mainly by means of diverse uses of public space.

(ii) Introduction of pedestrian precincts as a necessary stage of development and consolidation of social activities and/ or of the environment.

(iii) Quality schemes tailored to individual circumstances and in keeping with what already exists.

In order to feel part of the urban environment, individuals need to experience a sort of intellectual attachment. The first precondition for man-city interaction is a psychological propensity or positive predisposition brought about by transi-

tional stages between the state of void and the built-up environment, integrated however with both phases. A sense of nature can also be conveyed by the following: gardens, tree-lined streets, parks, green open spaces; but they must be planned in such a way as to be integrated with the built-up environment. The schemes in question must therefore establish links between the buildings present and functional structures through formal and suggestive means.

Greenery as a means of respecting the more sensitive attitudes of the human psychological condition. It is therefore not just a question of structures but also of ecology; not just a question of environment but also of landscape. Landscape induces emotional states: action, contemplation, attachment if it has aesthetic qualities; otherwise it produces discomfort and feelings of uneasiness, or even outright rejection. Landscape is the medium between a place and a feeling of belonging: sensorial interpretation of the vital need for a healthy environment. It represents the collective unconscious, the need for places, space and nature forming a reference framework.

Lanscape is of course an all-embracing general concept. And the question immediately arises as to what are the basic reference points; the architypical features. The points on which to focus in order to analyse the constituents of the specific expressive language. Gardens, for example, those architectonic spaces, have always reflected the logic of a natural order. And then there is the question of scenic aspirations. And then again there are the recurring natural features of Italian Renaissance villas, plant architecture, fountains and the like, the geometrical shapes of topiary, etc. have played various roles, lending coherence to the criterion of representativeness.

Nowadays, in the era of regional planning, urban parks and public greenery, the basic problem is of course that of identifying the specific expressive vocabulary to enable a society to recognize itself in its environment. And one indication might be that of Le Corbusier who for his city with three million inhabitants resorted to the English garden to define the typology of the natural link between the towers.

It is therefore not just a question of green architecture as the Utopia of the most up-to-date cultural style, but also as a concrete response to the need for better sensory emotions.

5. URBAN DESIGN

Tackling the problems described above, grading them by functional necessity, means giving shape to urban design.

Urban design is therefore an instrument of reconstruction and conversion of the city to trigger off regenerative processes and to reconstruct the man-place relationship by focusing attention on the environment. An individual definition of the site which repeatedly, through architectural projects, brings functional requirements into harmony with habitability.

Urban design operates in various ways: from simple remedial action to transform disfigured buildings, to restoring historical parts of the city using scientific criteria. Or the simple juxtaposition of a series of good design components. However, the important thing is that attention is focusing on them even in the absence of the actual building fabric. And this is very often what happens in practice with major settlement schemes, where some places are treated in such a way as to become catalysts in the general area development process.

The underlying principles are as follows:

(i) To recognize public space as an area designated as the formal representation of the needs for collective and civil identity.

(ii) Sketching out the shape of cities on the basis of the definition of the connecting parts: not adapting the latter to the building fabric but designing them independently in accordance with complex overall designs. Recognizing of course that the modern movement has aggravated, as a result of functionalism, the creation of architectonic individualism.

(iii) Recourse to expressive principles reiterating the value of the regional characteristics of architecture, without using them in non-critical fashion, but selecting them and interpreting them; hence realizing the importance of the use of language to arouse the collective imagination.

(iv) Giving priority to detailed solutions, small-scale schemes, where it is easier to control quality: creating immediate examples of quality projects which can be applied to larger-scale solutions, seeking to polarize towards centrality.

6. THE VARIOUS REAL-LIFE SITUATIONS IN EUROPE

Situations differ from one European country to another. In some considerable attention has been paid to the environment for many a long year, while in others great efforts have been made to catch up.

This is reflected in particular in Spain where major schemes are being carried out with committed fervour, as a result among other things of the return to democracy, and the desire to communicate a sense of renewal; also the public authorities play a big role in the local cultural dimension.

However, a few points which apply to all the different situations should be made:

(i) First of all the environment, as defined above, is now in every European country a genuine social demand which calls for high standards in the shape and form of places, spaces and related objects in urban areas.

(ii) Secondly urban quality can only be obtained through a process of architecture definition. In fact, in order to express effectively its function in the complex upgrading process, urban architecture calls for more than urban planning or coordination with the instruments for the control and development of the building fabric or with the sector plans (mobility and transport and traffic) to verify the common parts (pedestrian precincts, tree planting, etc.). This coordination has yet to be defined in terms of means and procedures, but it should be prepared with great sensitivity and attention.

(iii) Lastly, explicit recognition of the important role which the physical definition of the city can play in furthering the attainment of the objectives of planning obviously introduces a new variable which will have a considerable effect on the evolution of urban design and in defining different and evolving operating models to implement the principles set out in the Charter of Athens.

7. REPORTS

7.1. Structure of EEC analysis on the urban environment

Sandro Giulianelli, Commission of the European Communities

The process of city growth has generated many densely built-up areas which cannot be regarded as cities in the positive meaning attributed to the word but rather as dense peripheral areas devoid of primary services and facilities, whose environment lacks any sort of quality, areas which in fact may be regarded as the dustbins of humanity.

The Commission of the European Communities has set itself the task of examining the problem and gathering information about schemes which could bring about an improvement in the situation.

Possible (and desirable?) future scenarios have been advocated by McLuhan which, through the decentralization of activities as a result of information technology (manufacturing, research, financial activities, etc.) assign city centres the function of collective memory and culture centres but also places for consumption, entertainment, etc.

It is necessary to acquire an understanding of the nature of the transformations and the means whereby they can be controlled.

7.2. Green areas in English cities

Steve Ankers, Greater Manchester Countryside Commission

The man responsible in the Manchester area for peripheral urban parks and urban fringes or the demarcation line between built-up areas and the countryside emphasized the importance of urban greenery and natural areas within built-up areas.

National sensitivity to such matters in England dates back to 1965. Green areas in cities amount to about 20% in area, relative to the built-up areas. They are maintained (e.g. in Manchester) thanks to funding from the Department of the Environment and the Countryside Commission.

8. THE ITALIAN SITUATION (DAY 2 OF THE CONFERENCE)

On the basis of an examination of the situation in Europe, the conference then analysed the debate in Italy on specific mat-

ters, inviting and questioning eminent representatives of the authorities responsible for urban design and academics and technical experts responsible for research and training in specific areas of urban planning.

Day 2 of the conference opened with a report by the Director of the Ministry of Agriculture and Forestry, Alfonso Alessandrini, and reports by G. Capuano and Felice Ruffolo, advisors in the Ministry of Urban Areas, who gave an overview of the main programmes and projects under way or proposed at ministry level.

The successive reports in the morning tackled the questions from the urbanistic (Marcello Vittorini), sociological (Nando Della Chiesa), and economic and legislative points of view (Duilio Gruttadauria), paving the way for the forum in the afternoon.

The representatives of authorities which have attempted to implement urban regeneration programmes gave an account of their experience, taking stock of the difficulties encountered and the results obtained.

One of the many interesting accounts given concerned the region of Friuli Venezia Giulia, the first region in Italy to have adopted a regional law on the subject (39/86).

The academic world was represented by lecturers from Italian architecture faculties and representatives of the main cultural associations active in the field of urban architecture (INU, Inarch, AIAPP, etc.) who examined the topic from a strictly methodological and disciplinary point of view, emphasizing the need for quality control techniques and instruments.

9. THE EXHIBITION

There was an exhibition covering the topics debated which remained open during the first week in December, in the area inside the Victor Emmanuel monument and leading up to the conference hall. In view of its proportions, this public monument of the City of Rome offered an imposing architectonic framework for the numerous design objects and displays.

It was the first time that the Victor Emmanuel monument had been used for a conference (and for an exhibition), reflecting the institutional interest in the subjects discussed. The exhibition involved a series of parallel sessions comprising posters, videos and urban design components.

The display provided a panorama of advanced and sophisticated Italian products in this sector, and it emerged from the debates that there is a vital need for quality industrial design for urban areas.

In the video room showings were given of the audiovisual productions of the RAI school education department and public relations sector.

Another section of the exhibition gave a panoramic view of the typological and architectonic evolution of public spaces in the main contemporary European cities and an exhibition by the Association of Italian Designers showed the most interesting urban design projects of contemporary Italian planners.

ARREDO URBANO E VERDE PUBBLICO
STRUTTURE PER ABITARE LA CITTÀ

Convegno internazionale
28 novembre 1989
Roma, Vittoriano, piazza Venezia

CEE
Rivista *AU*

Presiede

Carlo RIPA DI MEANA, commissario europeo
all'ambiente

Introducono

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Renato CECILIA, direttore della rivista *AU-Inasa*

Interviene

Carmelo CONTE, ministro delle aree urbane

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4

ENVIRONMENT AND URBAN DEVELOPMENT

Perspective for an integrated policy in the European Community

Synthesis of seminars in Avignon (18 to 20 December 1989)
and Bremen (24 to 28 January 1990)

Hugh E. WILLIAMS
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1. INTRODUCTION

This report is based upon the presentations and discussions at two seminars in which the Commission of the European Communities brought together a wide range of professionals, academics and policymakers from towns and national and international organizations. The seminars were held at Avignon from 18 to 20 December 1989 and in Bremen from 24 to 28 January 1990. The aim was to cover the issues in relation to the towns of the 'south' or Mediterranean regions of the Community in the Avignon seminar and those of the more central and northern areas in Bremen. There were, in fact, more similarities than differences between the issues, problems and responses discussed at each seminar and hence this report combines the results into a single commentary. Whilst a general consensus emerged at the seminars, the conclusions presented here are the responsibility of the author.

One of the main aims of the seminars was to provide results which could be channelled into a Green Paper to be published by the Commission in June 1990 dealing with the urban environment. The proposed Green Paper is intended to:

(i) appraise the types and the extent of the environmental problems of the cities and urban regions in the European countries and discuss their causes;

(ii) present the strategies and responsibilities concerned with the solution to the problems on the local, regional and national level of the member countries of the Community;

(iii) discuss the effects of Community policies on the environment situation of the cities and urban regions in the European countries;

(iv) present exemplary solutions and discuss their transferability;

(v) demonstrate the possibilities and perspectives of an integrated policy in the Community and put them up for discussion.

The seminar papers and discussions brought together a wealth of wisdom, experience and ideas which is of great importance given the substantial environmental problems faced in urban areas. Clearly it is not possible to summarize all of this without doing a great injustice to the richness of the

debate and detail of the contributions. Hence the purpose of this report is to bring out some common threads in the discussion and to identify some broad conclusions that emerged from the work.

The report is organized around five main sections:

(i) the nature and causes of urban environmental problems;

(ii) solutions and transferable models to deal with the problems;

(iii) the city in its wider context;

(iv) general recommendations for management;

(v) conclusions and a message to the Commission of the European Communities.

The focus of the seminars and this report is primarily upon the physical aspects of the urban environment. However, it is important to recognize that environmental issues are but one aspect of urban life and that an integrated approach to urban areas must include social, cultural, housing, economic and many other aspects. Any measure of the 'success' of towns and cities must include progress on these wider fronts. It is within this context that the discussion below on urban environment is presented.

2. THE NATURE AND CAUSES OF URBAN ENVIRONMENTAL PROBLEMS

The review of urban environmental problems discussed during the seminars revealed a striking similarity in the nature of these problems from city to city — regardless of whether these cities were in the 'north' or 'south', or varied in size or were at different stages in the cycle of urbanization, suburbanization, decentralization, reurbanization. The key and common features described again and again were:

(i) air pollution — primarily from traffic and energy sources;

(ii) problems of waste management and disposal;

(iii) problems of waste water treatment in some areas;

(iv) the destruction of amenity:

    (a) through increased traffic, congestion and particularly traffic noise,

    (b) the loss of heritage and public spaces in towns to new developments, roads or traffic,

(c) the loss of green spaces in towns,

(d) the loss of ecological resources in towns and in their surrounding areas,

(e) the increased use of land resources for building/development, both in towns and their surrounding areas;

(v) social polarization of cities in which the poor and other less fortunate social groups are concentrated in certain areas and excluded from others.

Clearly there are variations between cities. For example, certain towns, subject to rapid urbanization pressures, have difficulties providing adequate infrastructure for waste disposal or sewage treatment. Yet even in older areas, the problems of under-used and derelict land may be most prevalent in some of the older, declining industrial cities — vacant, derelict and disused sites are to be found in even the rapidly growing cities of the 'south'. Nevertheless, these are variations within a clearly common set of urban environmental problems affecting the towns and cities of the European Community.

Although the general nature of the urban environmental problem as described is well known, it was clear from the seminar that there is a great lack of comprehensive or comparative data available. Whilst some cities have good quantitative data on certain aspects (noise, air pollution, waste arisings), most do not. Hence the general appreciation of the Community urban environmental problem is qualitative and subjective — but no less real. Considerable attention was given in the discussions of the seminar to the need for systematic methods of measuring and monitoring urban environmental conditions in a comparative manner.

Whilst the participants of the seminar were able to catalogue the nature, if not the scale, of urban environmental problems, far less attention was given to the underlying causes of these problems. This suggests that we are indeed clearer as to the environmental symptoms than the causes. Yet it is these causes that need to be addressed if fundamental environmental improvements and the prevention of further deterioration is to be achieved. There are at least three broad causal areas that need elaboration.

Firstly, an important underlying mechanism is the impact of market forces, in many instances now being strengthened by the impetus of the drive towards the internal market. Some of these latter effects are discussed in the recent Commission

document '1992 – The environmental dimension'. In general the impacts of market forces are all pervasive and a comprehensive analysis is impossible here. Whilst there is a considerable understanding of the technological solutions to, and the causes of, increased pollution and waste from industry and households, it is perhaps those aspects which relate to the rate and form of development and redevelopment of land and buildings and the growth of demand for transport which we less well understand. Most of these aspects which relate directly to the nature and form of urban development, are of particular relevance to many of the key urban environmental problems raised. Examples include: the growth in car ownership and increase in urban traffic, the locational requirements of industry related to access requirements and lower density buildings giving rise to pressures for peripheral development, the increasing importance of just-in-time delivery and the associated demand for distribution centres and easy road and rail access to industrial and retail sites, the impact of the freedom of movement of capital and investment on the location of plant and ownership of land and buildings in major cities.

Finally, in relation to market forces it is also relevant to mention the increasing competition between European cities for economic activity and mobile investment. This is a two-edged sword. It requires cities to offer an increasingly more attractive quality of life and to compete to provide a good environment. On the other hand, cities also have to be more responsive to the demands of particular companies or sectors and hence are under more pressure to conform to the demands for particular sorts of development (peripheral sites, large redevelopment schemes, etc.) which may not always suit the overall scale and shape of the host city.

The second group of important impacts on urban environments arise from the effects of policy actions themselves – primarily through the unintended or unconsidered environmental effects of policies concerned with other sectors, but also through mistakes or lack of coordination. It must also be recognized that there are indeed 'trade-offs' to be made between environmental quality and other objectives or indeed between environmental quality in one area as opposed to another (the choice of location of waste disposal sites or of infrastructure with a major environmental impact such as airports are classic examples of the latter).

In the case of an individual city, the impact may arise from policy made at a 'higher' governmental level (regional, na-

tional, EC), from the impact of policy in neighbouring municipalities, or as a result of uncoordinated sectoral policies in the city itself. Of the latter kind, transport policies are classic examples. In many cities, transportation planning gives greater emphasis to individual and private car mobility at the expense of the environmental impact. Environmental externalities affecting neighbouring municipalities can arise from such decisions as the location of a municipal airport or the quality of treated waste water returned to a shared river.

In addition, the 'top down' sectoral policy context within which cities operate can have profound and sometimes unforeseen effects. The seminar in Bremen was given a striking example of this in the impact of new European Community agreements to increase allowable sizes of heavy goods vehicles. In environmental terms this will result in a requirement for larger turning circles (and hence larger junctions with considerable implications for requirements to widen streets, demolish buildings and place under pressure older more historic centres and street forms). Other examples are, of course, the impact of the policy of the single market, although here we see the first steps in a preventative and more integrated approach being developed through the Commission's study to assess the potential environmental impact. Other policy impacts are more subtle and less easy to foresee. For example, at the Avignon seminar a representative mayor from Portugal pointed out that the ERDF rules were applied in such a way in Portugal that the building of advanced factory units could be funded only if large estates were developed and this often results in inappropriate forms of development rather than allowing the funding of advanced units and starter units in small lots to fit into existing industrial areas.

Finally, in considering the causes of environmental disamenity, it is important to remember that these market and indeed policy forces are often related to the conflicting demands of consumers and residents. For example, much of the pressure for suburbanization and decentralization to the rural areas around major conurbations comes from demands from residents seeking lower density, more rural locations and what they perceive as an improved quality of life. Similarly, pressures for traffic growth are not purely commercial – many people still want the freedom and flexibility afforded to them by the use of the private car. Yet these, too, are the residents who are affected by the environmental impact of traffic and the loss of vitality of urban centres.

3. SOLUTIONS, LESSONS AND TRANSFERABLE EXPERIENCE

3.1. Introduction

In the seminars, particularly the workshop sessions, a wide range of examples of responses to urban environmental problems were discussed. These ranged from waste recycling, energy planning and the management of air and water pollution to examples of city centre renewal, the renewal of residential areas and improving the balance between the city centre and the periphery. The major part of this discussion concentrated upon the problems and solutions to be found and implemented at the level of municipalities or local authorities themselves. However, a number of examples did illustrate an important point. Namely, that it is in urban areas, precisely because of the concentration of people and activities, that certain energy and environmental improvement policies can be effective (e.g. mass transit, waste recycling, etc.). This point is discussed in more detail below.

Despite the similarity of urban environmental problems in each of these fields, there was a strong view that there is no single set of solutions that can be universally applied at the city scale. Rather, emphasis was placed upon the diversity of European urban culture and hence the need to develop appropriate solutions for each unique situation. This does not deny the value of exchanging experience and learning from good examples and mistakes. It merely emphasizes that such experience cannot be transferred as a model to be blindly copied, but should be used to help design responses suitable to the urban area in question.

3.2. Integrated and successful solutions

Whilst solutions to individual problems have to be tailored to the needs of particular areas there was very firm agreement that integrated solutions can best be developed and implemented at the local level. In view of the central concern of the seminar with an integrated policy towards the environment and urban development, this was an important conclusion. This view was largely based upon the recognition that the urban system is highly complex and a large number of inter-relationships exist between the urban environment and other aspects of urban policy. It is therefore easier to recognize, handle and understand this complexity at a local or city scale.

In addition, there were other features of solutions that were identified as characterizing successful solutions to urban environmental problems. Such successful solutions:

(i) integrated environmental and other sectoral issues:

(ii) involved the local community in developing and implementing solutions through encouraging partnership between city government, the private sector, the voluntary or not-for-profit sector, and residents;

(iii) identified the local features of problems and built upon the strengths and opportunities of the local town or city.

It was recognized that solutions of this kind can most easily be developed at the local or city level since it is at this scale that the connections have to be made. Furthermore, there are, in many cases, choices to be made in detail and in terms of broad objectives between levels of environmental quality, quantitative and qualitative aspects of the local environment and, possibly, other objectives (related to costs, other sectoral policies, such as tourism development, access policy, etc.). In many cases, the value judgements, trade-offs and reconciliation of competing objectives and views can most legitimately be made at the local level by local citizens through their channels of communication and their democratic structures in municipalities and local authorities.

It is useful to note that these general conclusions regarding the features of successful urban environmental projects and the city scale being the most appropriate governmental level for implementing such successful integrated urban policies mirror very closely the conclusions of the OECD's recent urban research programme.

3.3. Economies of scale for solving environmental problems

A second major conclusion to emerge was that urban areas offer opportunities for 'economies of scale' in solving certain environmental problems. That is to say there are a number of important environmental problems that can be solved at the city scale because the density of activity and development in urban areas lends itself to suitable solutions. This is of major significance in the context of European Community policy on urban environments since many of the problems which might be addressed in this way are of international or global significance. Three examples may help to highlight this. The seminar learnt of the energy savings to be made by an integrated

approach to energy planning for industrial users in Berlin and by the use of district heating and associated energy planning for residential areas. In addition to these approaches, the Swedes have pioneered layout designs for residential districts which, through control of micro-climates, reduce heat loss. In the more southern climates there is experience also of using building layout and tree planting to create micro-climates that reduce heat gain and hence reduce energy demand for air conditioning. In all of these cases, it is the proximity of many potential users and of buildings which makes the solutions viable and hence only appropriate in urban areas.

The effects of such solutions are, of course, to reduce energy demand and hence in those Member States where energy is produced from fossil fuels, to reduce the generation of 'greenhouse gases' and contribution to acidic air pollution (CO_2, NO_x, SO_2, etc.). Transportation and, in particular, motor vehicles are also major contributors to the pollution load of greenhouse and acidic air pollution. It is only in urban areas where there is a high density of population and activity that mass transit systems — which are more energy efficient — can provide viable alternative transport solutions.

It is also in towns or densely settled areas that the opportunities arise to collect, process and recycle or otherwise re-use waste. The recycling of materials (e.g. aluminium) becomes more viable where the density of population makes the collection process easier. Similarly in major areas where there are very large volumes of municipal solid waste it becomes more feasible to build sophisticated plant for the treatment, sorting, recycling and energy recovery from waste. These solutions reduce resource use, can contribute to reduced energy demand and help reduce disposal to landfill with its resulting production of methane — another 'greenhouse gas'.

It is thus clear that urban areas and cities *because of their very nature* can adopt policies and projects which can make a significant contribution towards the solution of major global environmental problems and help to move us towards more sustainable development.

In these two sections we have defined the symptoms of environmental problems at an urban scale and also pointed towards some of the solutions that can be designed and implemented at the city level. However, cities cannot be addressed solely as if they were independent of wider national and international concerns. It is to the city in its wider context, that the next section turns its attention.

4. 'NO CITY IS AN ISLAND'

Although it is true that there is something of a renaissance in the international role and importance of the individual city it is also the case that cities, whether they like it or not, cannot, operate independently from their regional, national and international context. This is so for a number of reasons:

(i) The environmental impact of an urban area is widespread. In the section above, mention was made of the global significance of air-polluting emissions from energy and transport sources to which cities make the major contribution. Another example relates to the great rivers of Europe where the abstraction policies of urban areas and quality of waste or used water returned to rivers must be addressed within a wider national or international context. On a more local scale development decisions, for example the choice of location for a municipal airport, can have environmental consequences for neighbouring municipalities. Even the apparently local choices related to the conservation of historic monuments and 'patrimoine' have wider consequences. This may be particularly so with regard to major monuments, since there may be a legitimate interest by all Europeans in the preservation of what can be seen as a common cultural heritage. This is especially so in a context where there are Community actions in place providing support for economic and social cohesion and convergence between regions which could, if not carefully handled, damage such cultural resources.

(ii) Certain solutions to environmental problems are not available for cities to develop at the urban level. For example, controls over the design of standards of vehicles (lorry size, noise limits on vehicle engines) can only be negotiated and imposed at an international level. In many other situations, urban areas have to develop their environmental policies within the framework of a wide national policy, for example on waste disposal or allowable emission levels, etc. Again, for reasons of harmonization, national competition control or competence, these frameworks have to be developed and applied at

regional, river basin, national or international levels. Finally, urban areas may well find environmental control imposed upon them as a result of international action and conventions designed to resolve global or international problems (e.g. North Sea, transfrontier pollution, etc.).

(iii) Cities and urban areas are subjected to the effects, including the environmental consequences, of sectoral policies that are the responsibility of higher tiers of government — energy pricing, transport policy, etc.

(iv) Cities and urban areas are also interdependent in other ways. Increasingly, urban areas act within a wider/international and global economy, having direct links with markets in other countries and being part of a network of multinational influences. This raises again the need to understand the environmental consequences of certain aspects of market forces mentioned in Section 2.0 above. It is also within this context that the economic competition between cities arises. It may be that cities need to coordinate their actions if they see a need to make a concerted response to economic pressures for environmental reasons or they may need some ground rules for competition if they are not to undermine each other.

(v) Finally, but of great significance, municipal governments throughout the Community rely on their State and central governments (and to some extent the European Commission) for major financial support from the tax base. To the degree that resources come from higher levels of government, there will always be a degree of control over how municipalities spend these resources because of the need to retain accountability.

Thus, whilst the city scale may be the ideal level of administration for designing and implementing a very wide range of integrated environmental urban policies, there is a very important need for coordination between authorities. This coordination has to be both 'horizontal' between cities and local authorities and 'vertical' between local areas, cities, regions, Member States and the European Community.

Furthermore, higher levels of government have to set the framework within which municipalities can have the flexibility and freedom to develop and implement sensitive and successful integrated environmental policies at the local scale. This is not simply or even primarily an issue of the devolution of power downwards (the competence of different levels of government varies markedly between Member States). It is a recognition that many of the frameworks within which city councils operate (legal, economic, agreements on standards, etc.) are set at a higher governmental level. Moreover, as indicated above, some solutions to urban environmental problems can only be initiated and implemented at national/international scales.

It is, of course, the case that national governments and the European Commission will continue to develop and implement sectoral policies. There is clearly a need for such policies to be tested for, and evaluated against, their urban environmental implications. These last two points reinforce the need, expressed in Section 2.0, to understand more fully the causal links behind urban environmental problems.

It is clear that opening up a dialogue between cities and other levels of government is one important way of enabling the required coordination and enhancing the understanding of the environmental consequences of, and opportunities for, action at different governmental levels. It became clear at the seminars that the events themselves and the Commission's proposed Green Paper could help to set in motion such a process of dialogue.

5. GENERAL RECOMMENDATIONS FOR MANAGEMENT

The seminars and workshops illustrated that a wide range of concrete solutions and responses to urban environmental problems have been developed at city scale. As discussed above in Section 3.2, the most successful of these have a number of common features. This suggests that an important way in which our existing level of expertise and understanding can be more effectively applied is to improve management practices at all levels of government to reflect the features of the most successful solutions. Seven management recommendations can be drawn from the proceedings of the two seminars.

(i) At the local city level policies should actively integrate environmental and other policies. Such integrated policies need to be developed and implemented with the participation of all sectors of the city. This gives effect to conclusions regarding the nature of successful solutions and

the urban level being the best scale at which to develop integrated policies.

(ii) At higher levels of government, policies and actions should be made to anticipate what effects sectoral policies and other actions will have on the urban environment.

(iii) A dialogue should be opened up between cities and between the different levels of government. This will help to enhance coordination and understanding of the environmental needs of cities and the consequences of proposed policies.

(iv) When taking decisions on policy development and programmes, or in relation to project selection use criteria that include the wider urban and environmental dimensions.

(v) It will have to be recognized that if such wider criteria are built into the requirements of sectoral policies that this may result in more expensive solutions. This is particularly important, for example, in relation to such sectoral activities as regional economic development. If the European Regional Development Fund requires projects and programmes to respond to environmental, as well as economic, criteria then it is necessary to realize that extra resources will have to be found for two aspects. Firstly, to help with training and technical assistance so that local governments can learn how to integrate environmental factors into economic projects. And secondly, because the addition of the environmental criterion may increase the costs of specific sectoral proposals (although means will have to be found to ensure that this does not result in the Commission paying firms and Member States to cease polluting to meet existing directives).

(vi) It should be the explicit intention of public sector bodies to monitor and evaluate the impacts and effectiveness of their policies and expenditure programmes. Hence, they should have *ab initio* clearly defined objectives and targets against which to evaluate effectiveness. Where appropriate these should incorporate environmental objectives.

(vii) The introduction of new dimensions into management — in this case the urban environmental dimension — is only effective if there is adequate attention to the training and attitudes of managers of public programmes.

6. A MESSAGE TO THE COMMISSION OF THE EUROPEAN COMMUNITIES

Some clear messages and recommendations for the Commission of the European Communities emerged from the two seminars. A number of these have been outlined above. There are three major conclusions and six areas of recommendation for action.

6.1. Conclusions

The three major conclusions encompass those drawn out above.

(i) Integrated urban environmental policies and programmes can best be developed and implemented at the local level.

(ii) Urban areas, because of their very nature, offer opportunities for economies of scale in solving major global environmental problems and moving towards more sustainable development.

(iii) The workshops illustrated that a wide range of concrete solutions and responses to urban environmental problems have been developed at the city scale. However, as mentioned above, there still remain significant gaps in our understanding of urban environments and their causal factors. Hence a need remains for research in three broad areas:

(a) descriptive, qualitative survey work to provide comparative data on the scale of urban environmental problems across European cities;

(b) analyses to address some of the causal factors and processes underlying urban environmental conditions — particularly some of the land/capital market forces and their impact on urban quality;

(c) economic analysis to develop our understanding of the ways in which we can internalize environmental damage costs and long-term preventive gains into the market decision-making mechanisms.

6.2. Recommendations

In the light of the conclusions and the discussions, six major areas of action for the Commission of the European Communities were recommended:

(i) The Commission should encourage and provide for a dialogue between cities and particularly between cities and higher levels of government. Indeed, the Green Paper could set in motion a process of:

    (a) towns articulating to the Commission what they require in the form of enabling legislation or directives to provide solutions at a higher level;

    (b) towns articulating to the Commission the likely urban environmental consequences of proposed sectoral policies or regulations;

    (c) the Commission being aware of the consequences of economic forces and competition between towns for mobile investment;

    (d) the Commission encouraging the exchange of ideas and cooperation between cities and between different levels of government;

    (e) the Commission maintaining responsibility for, and monitoring the consequences of, its expenditure programmes and policies.

(ii) The Commission should recognize that towns and cities — by virtue of their density of development — can offer highly efficient solutions to some of the major international environmental problems; for example, global warming, acid rain, etc. The Commission should set in train the processes for developing such solutions and determining the appropriate means of implementation.

(iii) The Commission should encourage and aid the development and transfer of 'know-how' and experience through:

    (a) supporting relevant research;

    (b) identifying and publicizing/diffusing examples of good practice or good lessons;

    (c) providing technical assistance to cities lacking in professional expertise and support;

    (d) supporting pilot schemes or exemplary projects that demonstrate the effectiveness of certain solutions which have some general applicability.

(iv) The Commission should identify, in those major sectoral policies that have an urban environmental impact, ways of mitigating that impact or integrating/encouraging environmental considerations. There may be, within sectoral responsibilities, the opportunity to help urban environmental conditions through legislation, for example energy conservation directives aimed at housing or other buildings. Alternatively, programmes might be implemented within frameworks that include urban environmental criteria. For example, it may be perceived that there will be adverse urban environmental consequences of support for, say, major tourism projects as a part of ERDF activity in historic cities. These could be overcome by funding projects only in those circumstances where the proposals are presented within the framework of an adequately implemented land-use plan. Finally, it should be noted that there are important environmental actions to be taken at the Commission scale which cannot be addressed more locally (e.g. emission levels on cars).

(v) The Commission should undertake to assess its own sectoral policy proposals against criteria that include the urban environmental dimensions.

(vi) The Commission should recognize that some of these actions will require funding support — particularly with regard to the first recommendations. If the Commission imposes environmental criteria on projects in other sectors it will be necessary to recognize that this may also give rise to increased funding requirements.

Commission des Communautés européennes
«VERS UNE ACTION CONCERTÉE EN FAVEUR DE L'ENVIRONNEMENT URBAIN DANS LA COMMUNAUTÉ EUROPÉENNE: ACTEURS – COMPÉTENCES – STRATÉGIES»

Avignon, 18-20 décembre 1989

**Colloque organisé par la Commission des Communautés européennes, direction générale de l'environnement, de la sécurité nucléaire
et de la protection civile, avec la collaboration du Centre européen de formation à la gestion de l'environnement
et des ressources naturelles**

Lundi, 18 décembre 1989

L'ORIGINE, LA NATURE ET L'AMPLEUR DES PROBLÈMES DE L'ENVIRONNEMENT URBAIN

Allocution de bienvenue
Maurice BOUCHET, président de la Chambre de commerce et d'industrie d'Avignon et du Vaucluse

Message de M. RIPA DI MEANA, commissaire de la Commission des Communautés européennes
Sandro GIULIANELLI, membre du cabinet du commissaire

Présentation du colloque: motivation, objectifs et résultats attendus
Gunter SCHNEIDER, direction générale de l'environnement, de la sécurité nucléaire et de la protection civile, Commission des Communautés européennes

Les similitudes et les diversités des problèmes de l'environnement urbain appellent une action solidaire
Franco ARCHIBUGI

Débat

Premier thème: Les conséquences de l'activité urbaine sur l'environnement
Président: Eugenio FRANGIPANE

– Les polluants de l'air et les bruits des déplacements, du travail et de la vie quotidienne
Leonidas DAMIANIDIS

– Les traces de l'activité de la ville: les déchets ménagers et industriels, la pollution des eaux et des sols
M. METTELET

– Débat

Second thème: La qualité de la vie urbaine dépend aussi de la morphologie des villes
Président: Alessandro BUSCA

– Le Centre: environnement de rencontre ou d'exclusion
Francisco POL

– Les périphéries urbaines: crise de l'environnement – crise des populations
Thalis ARGYROPOULOS

– Les lieux publics: articulation de la ville et cadre de vie
Daniel DROCOURT

– Débat

La ville doit être plus que la somme de ses parties
Michel CANTAL-DUPART

Mardi, 19 décembre 1989

ÉTUDES DE CAS: TIRER LES LEÇONS DE L'EXPÉRIENCE

Première session: L'action contre les pollutions et les nuisances

Atelier 1: Air et bruits
Président: Claude LAMURE
Présentateurs: Salvador GUALDI (air) et Salvador RUEDA (bruits)

Atelier 2: Déchets ménagers et industriels – Sols – Eau
Président: Josè Antonio DE LAS HERAS RAMOS
Présentateurs: Bruno DE CARMAN-TRAND (eau) et Valerio BERNARDI (déchets)
Reprise des ateliers et discussions

Seconde session: L'amélioration de l'environnement physique

Atelier 3: Problématique des quartiers urbains: le centre et la périphérie

Président: Georges SHADARESSIS

Présentateurs: Leopoldo CRINER (Lisbonne), Luís M. SANCHEZ (Vitoria), Aldo TARQUINI (Terni) et Michel RIVOIRE (Lyon)

Atelier 4: Les lieux publics: quelle gestion, quels aménagements mettre en œuvre pour un cadre de vie de qualité?

Président: Philippe DUFETELLE

Présentateurs: Giancarlo MATTIOLI (Bologne) et Fernando MENDOZA (Séville)

Table ronde: Les instruments et les moyens d'une stratégie intégrée de l'environnement urbain

Animateur: Julien GIUSTI

Participants: les présidents des ateliers et les représentants de directions générales de la Commission des Communautés européennes

Mercredi, 20 décembre 1989

LE PARTAGE DES RESPONSABILITÉS

Table ronde: Le rôle et les attentes des villes, des régions, des États et de la Communauté européenne

Président: Jean FLACHER

Rapporteur général: Nuno PORTAS

Participants: représentants de villes, de ministères et des institutions européennes

Clôture des travaux

Colloque européen

L'ENVIRONNEMENT ET LE DÉVELOPPEMENT URBAIN
«VERS UNE ACTION CONCERTÉE DANS LA COMMUNAUTÉ EUROPÉENNE:
ACTEURS – STRATÉGIES – COMPÉTENCES»

Brême, 24-26 janvier 1990

Commission des Communautés européennes
Senator für Umweltschutz und Stadtentwicklung der Freien Hansestadt Bremen
Avec la collaboration du Bundesministerium für Raumordnung,
Bauwesen und Städtebau der Bundesrepublik Deutschland

Mercredi, 24 janvier 1990

L'ORIGINE, LA NATURE ET L'AMPLEUR DES PROBLÈMES DE L'ENVIRONNEMENT URBAIN

Allocution de bienvenue

Mme LEMKE-SCHULTE (Senatorin für Umweltschutz und Stadtenwicklung der Freien Hansestadt Bremen)

Les problèmes de l'environnement urbain en Europe: possibilités et perspectives d'une action concertée de la Communauté

Thème central de la matinée:

Les villes – responsables et victimes des problèmes de l'environnement – Estimation et bilan des travaux de recherche dans le domaine des sciences de la nature et de la technique

Présidents: professeur DEELSTRA (International Institute for the Urban Environment, Delft); professeur ALBERS (Institut für

Städtebau und Wohnungswesen, Munich)

Conférence I:

La ville et l'environnement urbain. Problèmes et perspectives d'un développement urbain compatible avec une protection de l'environnement (professeur HEALEY, University of Newcastle upon Tyne)

Conférence II:

Pollutions de l'air et des bruits causées par la circulation, le travail et la vie quotidienne (Dr. HOLZ-APFEL, Institut für Landes- und Stadtentwicklung, Dortmund)

Conférence III:

Les déchets industriels et ménagers, la pollution des eaux et des sols (N.N.)

Discussion récapitulative

Thème central de l'après-midi:

Les conséquences des structures et fonctions urbaines sur la qualité de la vie – Estimation et résultats des travaux de recherche dans le domaine des sciences sociales

Présidents: professeurs DEELSTRA et ALBERS

Conférence IV:

Le centre-ville: lieu de coordination de diverses fonctions ou de séparation? Lieu de rencontres sociales ou d'exclusion? (professeur LEMAIRE, Louvain)

Conférence V:

La périphérie urbaine: lieu «laissé pour compte», livré aux maux sociaux et à la pollution, ou lieu bénéficiant d'un niveau de qualité de vie élevé et ouvert à tous? (professeur NIJKAMP, Free University Amsterdam)

Conférence VI:

Les lieux publics: lieux privilégiés d'épanouissement de la vie sociale et urbaine ou simples voies de passage pour la circulation? (professeur SPEN-GELIN, Institut für Städtebau, Wohnungswesen und Landesplanung, Hannovre)

Compte rendu des travaux de la première journée (professeur ALBERS):

Comment intégrer le développement croissant des villes, l'extension de leurs fonctions et les stratégies isolées élaborées en vue de maîtriser les problèmes de leur environnement?

Débat (sous la direction du professeur DEELSTRA)

Jeudi, 25 janvier 1990

A LA RECHERCHE DE MODÈLES D'ACTIONS PILOTES ET TRANSFÉRABLES

Thème central de la matinée:

Mesures contre la dégradation et la pollution de l'environnement

Atelier I:

Réduction de la pollution de l'air, des bruits et de la consommation d'énergie: instruments et moyens de réalisation de ces mesures

Président: professeur SUKOPP (Technische Universität Berlin)

– *Le modèle Aalborg: un concept énergétique à l'échelle urbaine* (M. LYBY)

– *Le modèle Dortmund: évaluation des projets concernant le développement de la ville avec son environnement* (M. RATH)

– *L'aménagement d'un réseau de pistes cyclables à Delft* (M. VAN ZEIJL)

Atelier II:

Réduction de l'exploitation des surfaces, de la pollution de l'eau et des sols occasionnée par les déchets ménagers et industriels: instruments et moyens de réalisation de ces mesures

Président: M. BURSTOW (Environment Commitee of the London Burrow of Sutton)

– *Un projet d'élimination des déchets urbains à Swansea* (M. OSBORNE)

– *Divers modèles écologiques pour l'approvisionnement et l'élimination des déchets dans le cadre urbain* (M. WARNE)

– *L'exemple Bielefeld: un projet communal d'élimination des déchets ménagers* (M. WIEBE)

Débat et compte rendu des travaux effectués dans les ateliers I et II (sous la direction des présidents)

Thème central de l'après-midi:

Mesures pour une amélioration de l'environnement urbain et des conditions de vie

Atelier III:

Mesures pour le réaménagement d'une diversité des fonctions dans les centres urbains et les lieux publics

Président: professeur KUNZMANN (Universität Dortmund, Institut für Raumplanung)

- *Le modèle Esch-sur-Alzette: la régénération d'une ville* (M. WEIDIG)
- *Régénération de la ville et engagement économique privé à Dublin* (M. BENSON)
- *Régénération de la ville à Bruxelles* (M. DE SALLE)

Atelier IV:

Mesures pour le développement d'une vie urbaine dans la périphérie et pour l'intégration de cette dernière dans la ville

Président: M. McDONALD (*Irish Times,* Dublin)

- *Régénération écologique d'un quartier de Brême*
(OEKO CEPT, M. LECKE-LOPATTA)

- *L'exemple Gateshead* (M. BARFORD)
- *Régénération d'une zone d'habitation à Breda* (M. LANGEVELD)
- *Méthodes mises en œuvre dans le cadre de la régénération écologique des villes* (M. IDEMA)

Table ronde:

Méthodes en vue de l'intégration des différents secteurs politiques dans la protection de l'environnement urbain

Président: professeur WOLLMANN (Institut für Stadtforschung und Strukturpolitik, Berlin)

(Fin: 19 h)

<center>

Vendredi, 26 janvier 1990

«OBJECTIFS ET ACTEURS D'UNE STRATÉGIE ÉCOLOGIQUE INTÉGRÉE DANS LA POLITIQUE ET LE DÉVELOPPEMENT URBAINS»

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Table ronde:

Pour une prise en charge des responsabilités à tous les niveaux politiques: acteurs, compétences, stratégies – Possibilités et perspectives d'une action concertée de la Communauté européenne

Président: M. COLLINS (Parlement européen)

Participants: Mme VOSS-VAN GORTEL (maire de Utrecht), M. CLOSE (maire de Liège), M. TROMMER (ville de Wolfsburg), représentants des ministères nationaux et de la Commission des Communautés européennes

Résumé des grandes lignes du colloque

Président: M. WILLIAMS (Ecotec, Birmingham)

Discours de clôture

Mme LEMKE-SCHULTE (Senatorin für Umweltschutz und Stadtentwicklung der Freien Hansestadt Bremen)

5

MILITARY FACILITIES AND LAND-USE PLANNING

Synthesis of a seminar in Cortina d'Ampezzo (2 and 3 March 1990)

Luigi CRIMI

Architect responsible for the Ufficio Servitù Militari of the Veneto region

It was no coincidence that the Veneto region hosted this symposium since it contains the highest concentration of military installations in Italy. In fact the military authorities are planning to dispose of a large number of their properties since they are no longer suited to the requirements of a modern army. Many of them used to be convents and are of considerable artistic and cultural value. Others were built as actual military structures at various times and tend to be in town centres.

There are also a number of military installations which are no longer used but which are difficult to dispose of because of their impractical location or physical condition (e.g. military fortresses in the mountains, ammunition dumps, etc.), and it is not worthwhile for the military authorities or the municipalities concerned to enter into negotiations.

However, in many cases, these installations would provide a perfect opportunity for pilot restoration or re-utilization projects appropriate to their historical importance, structure and location. Many of them are old buildings built for other purposes which were later converted for military use. Now however they are no longer suitable and it would not be efficient to continue to use them in this way.

Moreover, as they are reorganized and modernized, the armed forces are tending to dispose of their older properties and instead require new sites and buildings. Many of the properties which are no longer serviceable are exchanged for military housing which can provide suitable accommodation for personnel with a high degree of mobility.

However, there is no coordination between these measures and they normally depend on the initiative of each individual municipality. If this method of operation continues in the future, considerable town planning problems could arise. Because of the large number of different buildings now being abandoned, or which will be abandoned in the near future, it is necessary to solve the problem by taking a broader regional approach.

Nowadays many municipalities are not able to contemplate negotiations over these installations. This is primarily because of the high cost of restoring and using them and the small returns from selling them off, which makes the operation uneconomical from both the military and civil points of view, or because, by virtue of their size or location, the unused buildings are of more interest to the province or the region than to the municipality.

Hence it is necessary to prepare a properly structured plan for disposing of all unsuitable properties and to build new military infrastructures suited to modern requirements in locations which as far as possible do not interfere with town and land-use planning. It is important to select sites where new residential accommodation can be built in exchange and, at the same time, to initiate plans for re-using the old buildings.

From a town planning point of view, the re-use of major military installations in towns is bound to have major repercussions on the immediate environment. One example is the Arsenal in Venice, which takes up one whole district of the city. Using it for other purposes will cause enormous problems.

There is evidence that many authorities tend to acquire unused buildings before they have actually decided how to use them. This is clearly a bad approach in that there is likely to be a long delay before any action is taken, during which time the building may deteriorate to the point where it has to be abandoned (as is the case with the islands of the Venetian lagoon which used to be gun emplacements or ammunition dumps). Nor is it adequate to solve the problem by imposing general constraints in the plans which govern these acquisitions or on the general uses to which properties may be put. If it has not been decided how to use buildings, they should remain the property of the armed forces. Moreover, it should

be remembered that the military authorities have taken care of these buildings until now in such a way that they can be restored and used again.

Thus any application to transfer a building should be accompanied by detailed plans and specific projects indicating precisely how it will be used, with the proviso that the building must be suitable for that purpose and must continue to act as a historical reminder. Often architects can incorporate many different functions into buildings of this kind, but it is essential that they should preserve their dignity and history. Care should also be taken when making buildings accessible to tourists.

Another point to consider is that when buildings become free, or are made free for new uses, it is important that it should be possible to reverse the process without undue expense so that, subsequently, the building can be put to a different use with only minimal expense.

There is no denying that it will be expensive to acquire these buildings, particularly if the going rate has to be paid. It is important therefore to consider joint public and private ventures, or even to apply for international funding. Buildings should only be transferred to the private sector, whatever arrangements are made, if they cannot be put to public use.

Because of the outstanding features of some of their sites, it is to be hoped that the European Community will become actively involved in protecting disused properties by launching a European project to list them all and to restore former systems of defence where they can be incorporated into local land-use plans, particularly since this is a problem which now affects the whole of Europe.

The first step to be taken at regional level is to draw up a list of these sites as a basis for conservation and planning. The lists should not be restricted only to major fortifications but should also include all regional installations, trenches and tunnels which are known to form an integral part of static defence systems. The Veneto region for example has started to list and catalogue these installations. This work is expected to be of fundamental importance for any subsequent action and the preliminary list contains 136 installations shown on maps which indicate their significance and interrelationships.

Many installations have been listed, not only in towns but particularly in the mountains. They cover a period of a little more than 100 years and in most cases are the result of a number of different operations carried out at different times. They tend to have splendid views since they are obviously constructed on sites with the best possible visibility. They are extraordinarily placed from a scenic and environmental point of view and are accessible along old military routes which are still of great scenic beauty. They form part of the collective consciousness of the Veneto region and constitute resources of great value.

We shall now briefly consider certain experiments carried out in Europe into the re-use of disused military buildings or sites.

A number of projects have been carried out in Poland into the re-use of old military structures for civil purposes, one example being the fortifications at Cracow. These fortifications run for 20 km around the city forming five concentric circles. The fortification system has undergone various changes over the years to adapt it to the defence requirements of different periods. The last major modifications were a system of fortified outposts erected in 1914. These played an important role in 1914 against the Russians and again in 1939 against the Germans.

A programme has been launched to protect these fortifications and there are plans for a series of public gardens designed to respect the nature of the old fortress, together with architectural and landscaping plans.

When preparing the project, a list was made of all the monuments, including the fortifications and the pathways and of all buildings which could be defined as monuments. An estimate was also made of the value of the whole site and of the green area around it and a decision was taken on the extent to which the fortifications and other amenities could be

adapted and how users should be required to protect the monument. This project made it possible to use many of the old fortified outposts for recreational purposes.

French experiments have been based primarily on a policy of arranging compensated exchanges with the municipal authorities. These exchanges encourage the installation of military sites and buildings on the edge of cities, thus freeing isolated sites in town centres which can be sold to provide the money to build the new installations. There are many cases where former military fortresses have been re-used particularly in the overseas territories like Guadeloupe, where the Saint Charles fortress was converted into a cultural centre; the island of Saintes, a tourist destination in the middle of the Antilles, where the Fort Napoléon was converted into a tropical garden, and Guyana, where Fort Diamant was converted into regional council offices.

Germany has been experimenting primarily in re-using large military areas, particularly the strip of no man's land 1 km wide which runs for almost 800 km along the border between the two Germanys. This vast area has been made into a nature reserve, which the two States have agreed to protect.

Military manoeuvres are a serious problem. One course of action could be to devise a special impact assessment procedure for military activities on the grounds that this would at least point the way to a technical solution to the problem from both the military and civil points of view.

Finally, it has not always been the case that military presence in the past or in recent times has had a detrimental effect on management of a given area. In fact, fixed military installations have provided a real sanctuary for species of natural flora and fauna, even in cases where the surrounding area is totally built up and developed.

STRUTTURE MILITARI E TERRITORIO
REGIONE VENETO E ASSESSORATO ALLE SERVITÙ MILITARI

Cortina, 2 e 3 marzo 1990

*Presenzierà alle giornate del convegno
l'onorevole Carlo RIPA DI MEANA,
commissario della Comunità economica europea per l'ambiente*

Venerdì 2 marzo 1990

Saluto delle autorità locali

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Il patrimonio militare di valore storico-artistico-monumentale

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Interventi

Dismissione e permuta del demanio militare

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Dismissione di beni del demanio militare e conseguenti possibilità operative

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Sottocapo di S.M. I RMNE
Politica infrastrutturale: dismissione e permuta di beni militari

Architetto Nicola MOLINARI
Membro direttivo INU

Potenzialità legale alla dismissione del demanio militare nelle città

Riutilizzazione di beni militari dismessi: esperienze europee

Prof. Janusz BOGDANOWSKY
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Riuso e recupero di beni militari dismessi: esperienze a Cracovia

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Curatore museo di Dresda
Der Görlitzer Vogtshof Umgestaltung eines ehmaligen Militär-Gefangnisses

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Esperienze francesi

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Montagna ed esercitazioni militari

Interventi

Conclusione

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Studies

1

INDOOR POLLUTION

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The threat from ecological breakdown draws its noose ever tighter. As nature, long beleaguered, strikes back at her ravager, man finds himself beset on all sides by environmental disorder.

Today we are assailed even in, or rather by, our most intimate refuge, the home, and by that totem pole of our civilization, large-scale constructions, as an old assumption is turned on its head, namely that we build in order to exclude or 'shut out' nature, seen as a threatening or inadequate habitat.

We have built a great deal, maybe too much, certainly in too great haste, intent on form and a superficial concept of comfort rather than the satisfaction of real needs.

So it is that we now find ourselves confronted with the latest manifestation of a deranged environment: indoor pollution.

Definition

Indoor pollution, or pollution of confined spaces, is the particular form of pollution affecting the air and general interior environment of closed places in which human activities are pursued — including rest and recreation but not manufacturing of directly productive activities (the subject of specific standards and research). The concept covers pollution inside houses, offices, schools, hospitals, public buildings in general, recreational facilities, theatres, cinemas, indoor sports arenas, interiors used by people on a transient but constant basis, stations and terminals of all kinds.

Indoor pollution has come to the fore in recent years as a phenomenon with major scientific, social and economic implications.

Ascertaining the dimensions of the problem, formulating effective regulations and devising technical improvements are some of the measures of fundamental importance for tackling – and, if possible, solving – in a comprehensive manner a complex problem which is not amenable to simplistic solutions.

History and discovery

Albeit in less serious guise than today, this form of pollution has always existed. It remained, however, unrecognized even by many experts up until recently and appreciation of its gravity in the industrialized countries dates from only the last few years.

Its origins coincide with the first urban settlements in ancient times: there are numerous references in Latin literature to the hygiene problems of the 'insulae' (proto-apartment blocks) and the difficulties of disposing of urban waste in ancient Rome.

Witness again, more recently, the prevalence of rickets among the urban poor of London and Paris in the period 1600-1800 due to insalubrious living conditions. Indoor pollution seems to have really taken off this century with urban reconstruction in the post-war period, receiving further impetus from the oil crisis in the wake of the Yom Kippur war, which is also about when it first began to be taken seriously.

The sudden increase in the price of oil, coupled with the fear that reserves might one day dry up, prompted the industrialized countries to adopt regulations aimed at reducing energy consumption, in particular that entailed by the heating of buildings. This strategy was two-pronged, focusing on the one hand on improving the insulation of outer walls, ceilings and door- and window-frames so as to reduce heat loss through conduction, and on the other on better sealing of doors and windows so as to reduce heat loss through convection or simple dispersion.

Precisely this war on draughts has played a key role in the evolution of indoor pollution, as well as having led to its wider recognition.

The sealing of houses, and even more so of office buildings, had immediate consequences: not only was there a sudden increase in all allergic and pulmonary diseases but the rate of spread of infectious diseases among users of the same building also increased enormously, particularly where the building in question was air-conditioned. The cause-and-effect connection was immediately apparent and the findings of the first analyses of indoor air, and of indoor conditions in general, uncovered a vast and intricate problem.

The culprits were multiple: besides air, there was radon, perhaps magnetic fields and chemical and bacteriological pollutants which attacked the organism not only via the respiratory tract but even through simple touch.

Analysis of indoor air

The earliest concerted analyses of indoor air were conducted in the USA, Canada and Northern Europe towards the end of the 1970s. The air in homes, schools, offices and hospitals was discovered not only to be more toxic than the air outside – as stands to reason, consisting as it does of the latter subjected to further contamination – but even to contain a variety of noxious substances not found in outdoor air. Air-conditioning often aggravated the situation, not only by helping spread microbes but also by amplifying dangerous and subtly noxious effects, particularly in cases of inadequate monitoring and maintenance.

Sources of indoor pollution

Subsequent, more detailed analyses revealed 90% of the materials used in constructing and furnishing buildings to have greater or lesser pollutant effects.

To begin with the best known though not the most serious: radon is a radioactive gas given off by various types of soil which spreads upwards through houses from their foundations and which can also be present in solution in drinking water. More generally it can be given off by many minerals used in construction, such as certain types of sand and natural stone; indoor concentrations frequently exceed safety levels.

Then there are all the compounds containing formaldehyde, such as the glues used in furniture (e.g. in chipboard).

This chemical, which, like many plastics, has a variety of applications, gasifies more or less rapidly, evolving into the air in large quantities from new materials and continuously from old ones. Rubbers, resins, solvents, varnishes, carpet glues and wallpaper pastes can poison the air imperceptibly. Some substances have a limited 'degasification time' (less than six

Principal pollutant substances present in indoor air

Pollutant agent	Principal sources	Typical indoor concentration	Indoor v. outdoor
Originating mainly outdoors			
Sulphur oxides	combustion	0 - 15 mg/m³	< 1
Ozone	photochemical reactions	0 - 10 pp 10⁹	< < 1
Pollen	trees/grasses	variable	≤ 1
Hydrocarbons	combustion	variable	≤ 1
Originating indoors and outdoors			
Nitrogen oxides	combustion	10 - 120 mg/m³	> > 1
Carbon monoxide	combustion	5 - 50 pp 10⁶	> > 1
Carbon dioxide	combustion, respiration	2 000 - 3 000 pp/mil. (¹)	> > 1
Radon	soil, building materials	0.01 - 4 pCi/litre	> > 1
Originating indoors			
Formaldehyde	chipboard, insulating materials, furniture, glues, paper	0.001 - 0.5 pp 10⁶	> > 1
Asbestos, mineral fibres	insulating materials, filters	0 - 1 fibres/ml	≥ 1
Organic substances	adhesives, solvents, cosmetics, cooking, cleaning agents	variable	> 1
Allergenic substances	dust, animal hair, insect remains, fabrics	variable	> 1
Bacteria and fungi	cross-contamination	≥ 100 ufc/mt³	> > 1

Source: Domino processing of Niosh (National Institute for Occupational Safety and Health, USA) data.
\> : one to five times more
< : one to five times less
\> > : more than five times more
< < : more than five times less
* : Average levels in a home with a gas cooker.

months from when they set), others are more stable and continue to liberate gas as they age or whenever pierced.

Cigarette smoke is an old villain, damaging, it is now recognized, not only the smoker but equally non-smokers frequenting the same space, particularly children. Tobacco ash deposits itself on particles of dust present in all environments inhabited by humans and so minute as to be recirculated, rather than caught, by vacuum cleaners. Then there are all the residues of town gas combustion present in domestic dwellings with cookers, water boilers or heating systems run on gas.

There is, incidentally, no suction apparatus in existence capable of expelling all noxious residues from an interior.

Contradictory as it may seem, many substances used for cleaning actually pollute the air that we breathe, e.g. stain-removers, deodorizers, disinfectants and floor-washing products (particularly those that do not require rinsing, indeed frequently promoted as such). All these subtle sources of pollution conspire to impair air quality; clean aromas can denote a noxious interior.

It would be a mistake to think that things are any better in most offices, hospitals or shopping centres; with rare excep-

tions, air-conditioning is generally one of the prime sources of indoor pollution.

Most people can still recall the first outbreak of legionnaires' disease some years ago among the participants at a convention of the American Legion in Philadelphia. The offending bacteria, far from originating in some distant tropical land, had been biding their time in the hotel's air-conditioning for the right opportunity to unleash an infection. This incident underlined the fact that energy-saving imperatives mean that current air-conditioning systems are continually recycling a percentage of the same air, thus favouring, if the system is not regularly cleaned out, a general diffusion of microbes and, with it, a rapid and endemic increase in the spread of infections among users of a building, which, air-conditioned in all its parts by the same system, acts as an incubator of germs.

To complicate the situation, it is at present almost totally impossible, technically speaking, to inspect and clean out ventilation pipes effectively, which thus become ideal habitats for mildew, yeasts and bacteria, whose spores provoke many allergies as well as bronchial pneumonia.

Then there are a whole host of pollutant effects resulting from furnishings or equipment in the home or from the use of individual rooms for purposes other than those intended by the builder.

To take just one example: do-it-yourself work in the home, whether as a pastime or for small maintenance jobs which would otherwise be too expensive or impractical, usually means that extremely noxious substances, such as varnishes, solvents and adhesives, are kept in the house and, worse still, used in interiors which are inadequately ventilated during the actual work itself and then can retain and release substances for extended periods thereafter.

Office building interiors offer a rich field of study in connection with indoor pollution.

Besides the fumes given off by marker pens and typing machine ribbons, there is the dust of laser printers and photocopiers, ozone from the same and cigarette smoke, not to mention, according to some, high- and low-frequency electromagnetic currents.

Some researchers have even identified a specific category of environment, namely 'shelfing rooms', in which paper, books, etc. are kept on open-tiered surfaces. These rooms are con-

sidered veritable repositories and redistributors of pollution, if only on account of the extreme porosity of the materials stored in them.

Lastly indoor sports facilities can be the most lethal of environments in indoor pollution terms for the simple reason that, as exercise can require respiration of up to 100 times that of a person at rest, the air in question ought ideally to be 100 times cleaner than normal air. In reality, however, it is often extremely poor in quality, as a result not only of human pollution from sweat and skin desquamation but also from excessive use of deodorant sprays and detergents. Basement facilities make even worse sense, as many of the toxic gases in the atmosphere are heavier than air and forced ventilation systems have little or no effect against this.

Special mention should also be made of the flooring, finishings and coverings used in indoor sports facilities.

Clearly, then, the spectrum of indoor pollution is broad and diverse.

The dimensions of the problem

As research proceeds, facilitated by recently developed analysis techniques, it becomes clear that a real problem exists, it involves a high cost in both economic and social terms, it is not amenable to easy answers and derives only in part from heating and air-conditioning systems, emissions from building and furnishing materials being a prime source of indoor pollution (40% according to some researchers).

Data collected and measurements taken in Europe and the United States of America show about 20% of existing buildings to be seriously unhealthy from the point of view of their internal atmosphere and at least 50% to be in need of some kind of improvement.

Measures being taken around the world

The most active and advanced countries in this field are the USA, Canada, the countries of Northern Europe and Japan, the first studies in many of which date back as far as 10 years ago.

In these countries, various public and governmental bodies (ministries, research institutions, utilities, regulatory bodies, consumers unions and undertakings) have taken initiatives in a variety of fields:

(i) laboratory research into pollutants, investigation and measurement methods;

(ii) on-the-ground inspections with a view to techno-typology of buildings and large indoor spaces;

(iii) definition of standards, drafting of laws and regulations;

(iv) dissemination of research findings through special publishing series and the creation of open databases;

(v) drawing the attention of the public to elementary rules and concepts designed to limit indoor pollution, through educational booklets, articles, videocassettes, etc.;

(vi) development of 'sick' building improvement technology.

The bodies concerned in the USA, besides the EPA (Environmental Protection Agency), which has a team of 20 researchers and an annual budget of USD 3 million, are:

(i) a number of State departments (Energy, Housing and Urban Development, Health, Public Works);

(ii) NASA;

(iii) consumers unions;

(iv) the National Bureau of Standards;

(v) the Ashrae (American Society of Heating, Refrigerating and Air-conditioning Engineers);

(vi) the ACVA (Air-conditioning and Ventilation Association);

(vii) the BOMA (Building Owners and Managers Association);

(viii) electricity and gas companies and related research institutes (Electric Power Research Institute, Gas Research Institute);

(ix) many HVAC (heating, ventilating and air-conditioning) plant companies (including Honeywell).

Also in the USA there are nearly 3 000 companies engaged in indoor pollution monitoring and alleviation, which has taken on the dimensions of a major business sector (the asbestos removal market alone was recently estimated at USD 100 million).

Throughout the world new periodicals concerned specifically with indoor pollution are appearing all the time aimed at keeping those employed in the sector up to date on new regulations, equipment and research findings. Conferences on

the subject proliferate, with at least one of international interest held every month.

The European Commission, appreciating the gravity of the problem (radiation levels inside buildings can exceed measurements in the environs of nuclear power stations by 100 times), issued a recommendation in February 1990 on exposure to radon. Besides defining upper exposure limits (along the lines advocated by the leading authority in the field, the International Commission on Radiological Protection (ICRP)), this recommendation stresses the urgency of the measures it proposes given the extent to which safe levels are generally exceeded at present and devotes particular attention to raising public awareness of radiation exposure and the steps required to guard against it.

After four days of intensive deliberations, the Healthy Buildings Conference '88 concluded recently in Stockholm. Organized by the International Council for Building Research (ICB) through its Swedish branch and sponsored by the WHO and other organizations, it was attended by over 600 participants from 31 countries who discussed and compared experience regarding air-conditioning and atmospheric conditions inside buildings, in short the sum of current knowledge on indoor pollution. From some 100 communications and 32 reports, a comprehensive, and extremely alarming, picture emerged, so alarming that a majority of those in attendance saw indoor pollution as *the* major problem facing the industrialized countries in the immediate future.

At Ispra in Italy, CERN has launched a monitoring and research programme with particular reference to radiation problems (radon).

The Italian Ministry of the Environment has set up a study commission, divided into two subcommissions, to study air quality in confined spaces. Besides defining the problem in detail, this commission will present the ministry with a first series of proposals to combat the phenomenon.

The National Council for Research has allocated funds directly to the problem and is also involved through the Specific Building project, which includes a number of research topics in this field. Other bodies and ministries are also active in the fight against indoor pollution, each from a different angle according to its field of competence.

Tackling the problem

Indoor pollution is a complex problem: the multiplicity of its sources — the plethora of pollutant substances present in building materials, furnishings and equipment, the residua of town gas combustion, emissions from domestic cleaning agents and the use of premises for purposes other than their intended function — are all facets of a single problem.

The fronts on which it can be tackled are two in number and easily defined: buildings already in place, future constructions.

Existing buildings

The discovery of indoor pollution coincided in the industrialized countries, and Italy in particular, with a shift in emphasis within the construction sector.

Growth is no longer the most conspicuous feature of our cities, but rather the work being expended on rehabilitation and restructuring.

The prime focus of attention therefore must be buildings that are already in place. Now that it is known that most building, furnishing and equipment materials are sources of noxious emissions, the only practical strategy is to improve ventilation as fas as possible and monitor interior air conditions closely, with particular regard to moisture content. Research to date indicates emission levels from most materials to be at their lowest in conditions of 40-60% humidity.

What is required is the careful overhaul of air-conditioning systems, with at least 4/5 air replacement per hour plus humidity monitoring.

These measures are technically feasible and their cost is not exorbitant in the case of most buildings, even those with no air-conditioning systems in place. Indeed, as we have seen, such systems are generally fundamentally flawed and their use can only be recommended subject to radical modifications.

Acceptable atmospheric conditions can often be obtained simply by heating external air during colder periods and increasing air replacement when it is warm — except for the problem of optimum humidity conditions.

In the case of one or more particularly pollutant materials, substitution or some form of sealing will be necessary.

Particular care should be taken to ensure that gas combustion residua and, in general, cooking fumes do not escape from the kitchen to other parts of the home; this, again, can be obviated by simple and inexpensive modifications.

A lot can also be achieved by making all users of a building aware of a few simple expedients capable of making a major contribution to improving the internal environment, and any opportunities for making improvements offered by even the most routine maintenance jobs should not be neglected.

Future buildings

Though no longer preponderant, new building still accounts for a major proportion of the construction industry (most notably, tertiary sector and infrastructural projects).

Pollution in existing buildings is largely the result of substances, materials, products or methods being used without having been tested adequately for emissions or other adverse effects from any of their properties. To take just one example: the treatment of facades to seal their brickwork against transpiration can result in excessive humidity, condensation and mildew — in short, in insalubrious living conditions.

That said, it is just not feasible to wait for all substances and materials to be tested exhaustively before authorizing their further use.

The principle to be applied, then, is that of the 'best available technology'. This means on the one hand eliminating all materials and substances established as being toxic or hazardous (there are not many of these) and on the other applying all those expedients which contribute directly to the improvement of the indoor environment.

This involves the recognition that we are confronted with a 'hard core' of emissions which are not susceptible in elimination and which can only be tackled by recourse to measures based on the lay-out of the specific premises in question. As there is not space here to go into these expedients in detail, a few general pointers must suffice.

First and foremost the best possible ventilation must be guaranteed, with minimum 4/5 air replacement per hour, using natural ventilation where possible and forced ventilation only where necessary.

As far as possible the function of each individual room in the home should be well defined; it is especially important to en-

sure that mechanical equipment and domestic cleaning agents are not kept in living/sleeping quarters. Cooking should be conducted in an area apart situated at a lower level relative to the rest of the house.

Working spaces in offices should be separated from areas in which paper of any kind is stored or in which equipment such as printers or photocopiers are located.

Wall and floor surfaces should be as non-porous as possible and any carpeting or upholstery used should be easy to clean.

Areas used for storing (equipment, furnishings, materials, etc.) should be as well ventilated as the rest of the office.

Other desirable features one can look forward to in the future include: new domestic appliances for cooking, new water heating equipment (for hot water and heating) and new liquid- rather than air-based cleaning methods; the home, and internal environments in general, must be thought of as a complex and fragile system in which every choice — even of detergent — has consequences for the health of its users. Lastly a courageous rethink of the design of houses and offices is necessary, concentrating not just on the high-tech details of air-conditioning plants but also on alternative, less sophisticated technologies capable of ensuring satisfactory and healthy living conditions.

Indoor depollution and energy saving: reconciliation of opposing requirements

As said, the rehabilitation of existing buildings inevitably entails a significant increase in ventilation, the simplest of remedies but one which in turn entails increased air interchange and thus heat loss through convection. Given that it is a fundamental aim of any building to retain hot air when it is cold outside and vice versa, we are confronted here with a dilemma, which can only be resolved through financial investment and scientific expertise.

Existing window- and door-frames will presumably have to be replaced by ones that facilitate ventilation without generating unwelcome or noxious draughts, perhaps incorporating simple heat exchangers and temperature and moisture sensors to monitor the inflow of air.

In addition, the heat insulation of all structures will have to be improved to compensate for heat loss as a result of better ventilation.

The energy saving problem remains, nevertheless, although the economic cost involved is not great if compared to the losses to employers from illness among staff as a result of indoor pollution.

American researchers estimate that the loss in productivity and working days attributable to this cause are significant enough to justify large-scale fixed investments and even higher energy consumption.

The problem's complexity: other variables

The simplest way to increase ventilation at these temperate latitudes is, at most times of the year, to leave windows open, but this can expose us to another hazard, namely noise pollution, a complex problem which can only be tackled through new town planning and construction regulations designed to reduce general noise in built-up areas and through regulations to limit noise emissions.

Clearly environmental problems are by their nature complex and closely interlinked and require similarly subtle solutions and coordinated decision-making. Over-simplification is a sure remedy for failure.

New regulations

Any initiatives in the indoor sector will require concerted action by legislators.

Suitable town planning regulations and radical amendments to municipal building regulations will be needed to facilitate both the improvement of existing buildings and the construction of healthy new ones. By way of example: tax incentives to allow extra space for larger ventilation ducts or even inner courtyards will have to be provided and, for the same reason, areas with lowered ceilings or, alternatively, raised floors will have to be permitted; tax incentives for thicker curtain walls and ventilated facades will also be required.

As regards building materials, regulations fixing noxious emission ceilings will have to be adopted; regulations on the correct application of varnishes and plastic materials in general will have to be made binding and it will perhaps be necessary even for building timetables to be so regulated according to the seasons as to ensure that most pollutant emissions are released before a new building is put into use.

A whole body of new laws and regulations is required, then, covering most parts of the production process.

European cooperation

In a number of European countries, research is sufficiently advanced for regulations to be adopted on certain building and insulating materials, regulations which could have a bearing on the indoor pollution question.

The European Commission which is concerned with the building sector has a subcommittee on building materials.

These are ways of approaching the problem but hardly add up to the kind of concerted approach required.

The question needs to be dealt with as a whole and in all its aspects and not as a marginal feature of other problems.

The areas in which joint regulations need to be drawn up can be arranged thematically as follows:

(i) noxious emissions, sources, concentration limits; materials, fittings, equipment; certification;

(ii) location, land, urban environment;

(iii) lay-out of buildings and regulation of building hygiene.

Harmonization should be got off the ground before individual countries start adopting national regulations, especially so as to avoid regulatory barriers to the free circulation of goods.

To this end the possibility of setting up laboratories to be entrusted specifically with certifying materials, fittings and equipment for the Community as a whole must be given serious consideration.

Recent as recognition of the problem may be, there is an urgent need to start taking measures against it.

2

HEALTH AND THE CITY

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Conditions of health in our cities are determined to a great extent by a whole series of factors, including physical environment, geographical situation, weather conditions, micro-climate, prevailing winds, whether or not there are specific industries, power stations or nuclear power plants in the city or in the surrounding area, the type of agriculture and the extent to which plant health products and pesticides are used in the surrounding countryside, interpreted in its broadest sense since there are no limits to the dispersal of toxic substances in the atmosphere or through groundwater and they can reach urban centres hundreds, and sometimes even thousands, of kilometres away from the source of the pollution.

The size of cities is also of fundamental importance in determining the extent to which the health of their populations may be at risk. For example, studies carried out in Italy on a large scale have shown that noise pollution is most severe in towns with less than 50 000 inhabitants and with more than 500 000 inhabitants because, in very general terms, towns in the first category do not have the financial and technical resources to

contain the problem and towns in the second category are unable to handle the problem because it has grown to such a scale that local authorities are no longer capable of solving it, nor indeed is it their responsibility.

Another factor which many studies have shown has a considerable effect on noise pollution is the specific layout of the roads and squares in a city, which is more important than town planning in general, although this applies only to mobile sources of noise, of course, while the general public and legislators often tend to ignore fixed sources of often very loud noise for reasons which are very easy to guess.

Two simple examples should be sufficient to describe some of the specific kinds of urban disease: there are many asthma sufferers in cities because houses are warmer and damper than in the country, and far more people suffer from skin irritations. Extensive study has shown that reactions to the methacholine test increase sharply in towns (i.e. potential asthmatics) and that drivers of aboveground public transport vehicles, who do not smoke, have much higher carbon-monoxyhemoglobin levels because of traffic pollution.

Another factor which usually depends on the historical development of a town, and the types of production which have taken place there is the background radiation which characterizes each city. This is high in Naples and Rome, for example, because materials like tuff and peperino, which are traditionally used for building, emit high levels of radon. The asbestos found in coastal towns is certainly the reason for the higher incidence of mesothelioma in those towns and in the heating and cooling industries which also use asbestos.

When compiling health statistics, the problem is to quantify the increase in disease, and therefore of death, caused by the particular activity or situation concerned. The difficulty is that, in individual cases, death from disease (due to specific types of pollution) is indistinguishable from 'normal' death (i.e. where there is little or no pollution). In order to make statistical comparisons, the higher death rates among the population affected by a particular form of pollution are compared with the general mortality rate. This is the method which has been used for some time to identify occupational diseases: in two such cases (the lead poisoning from which printers tend to suffer and exposure of miners to radon 222 radiation), initial studies provided the basic knowledge required to tackle the problem on a wider scale and to help

those sections of the population now affected by these two types of pollution.

Extra deaths due to disease are generally attributed to pollution from the emission into the biosphere of substances which are harmful to health, including genotoxic carcinogens and mutagens. In fact, in the past levels of biological pollution were extremely high, as they still are in the developing countries.

Average life expectancy in the industrialized countries is around 75 years. The annual mortality rate is less than 1%, with old people accounting for most of these deaths, usually as a result of degenerative diseases.

In approximate terms, 95% of all deaths are the result of disease, 1% are caused by violence (murder or suicide) and 4% are accidental, half of them in traffic accidents and a third as a result of falls.

Modern society has done much to reduce the general level of microbiological risk but a tremendous amount of work still remains to be done to reduce risks from genotoxic sources.

Nowadays, because of the transboundary and universal nature of pollution problems, the hazards they cause tend to be dealt with at geopolitical level. In this context, the relationship between cities and non-urban areas is studied in terms of the general hazards to health, because the density of city populations does not of itself mean, for example, that the water is more likely to be polluted. In fact, compared with the centre of a large metropolis or an agricultural area suffering from pesticide pollution a small town may run just as much, or even more, risk because of its own environmental situation or the specific types of production there. Conclusions are difficult, however, because we still do not fully understand the relationship between immediate damage from pollution and its delayed effects on city dwellers in the form of disease. From a statistical point of view, therefore, it is difficult to compare the health of city dwellers with that of those who only work in cities (commuters).

Apart from those sectors of production which endanger health where action is being taken, there are other non-productive sectors which are in danger because no action is being taken (no monitoring and no pollution prevention). These include not only those workers who live away from the centres

of production but also those weaker members of society like children, the sick and the elderly.

Hence, environmental risk and damage should be evaluated at system level and not at the level of each individual plant or stage of activity.

In particular, studies on the health effects of atmospheric pollution which used the sulphur content of particulate matter as an indicator of pollution have had a paradoxical result. Originally measured as an indicator, the sulphur content has gradually been interpreted as the main cause of pollution. The beneficial effect on air quality achieved by drastically reducing concentrations of particulate matter does however not help the problem of the release of nitrogen oxides and the various genotoxic components produced by combustion (e.g. natural gas, which has no sulphur content but does generate quantities of genotoxic and acidic substances).

There is a contradiction between the concept of exposure, as a link between the presence of human life and concentrations of pollutants, particularly in the atmosphere, and the old data on concentrations for the open air. The data on the concentration of indoor pollutants, which result particularly from emissions inside closed environments where people spend much of their time, are very different again. Another essential point for discussion is how to evaluate the effect of a given dose of any pollutant. There are various attitudes which include the 'all-or-nothing' approach, the danger threshold approach and the stochastic approach (i.e. risk is acceptable within permissible limits, which may also include doses below the threshold value).

There are no regulations to limit emissions and concentrations in the air of benzopyrene, which is a carcinogenic product of any combustion process. Part of the reason why Chernobyl had such a wide-ranging impact beyond national frontiers was because its effects could be evaluated in terms of radioisotopes and by monitoring radionuclides. On the other hand, a huge fire extending over a large area produces non-specific genotoxic substances which it is impossible to distinguish from those generated by ordinary sources of combustion.

Rational considerations have little to do with perception of risk. There is a common tendency to consider that those situations which are more closely analysed are more hazardous than those which are not. There is thus a mistaken perception of those sectors which are more closely monitored, whereas those where there is no monitoring may perhaps be more hazardous.

This perception that small is safe is a myth which is not borne out by reality. Thousands of small heating plants, even though their total output is lower, cause much more pollution than one large plant since pollution depends on input rather than output and also because a large plant can be equipped with more sophisticated and more expensive safety and anti-pollution devices.

A metaphor can be used to describe the nature of the urban environment and the diseases prevelant in it. Although they differ considerably as regards structure, geography and types of production, cities resemble the lymph node system. It collects as many as possible of the pollutants produced by the external environment or by its own catabolism and is thus the central element in which are concentrated all those harmful substances which help to increase the risk of disease and reduce life expectancy. But at the same time it is the vital centre which serves to evaluate risk, provides a defence system, puts into effect fundamental changes to the internal and external environment and brings into play those forces required to restore and repair the damage suffered. In terms of health, cities, like lymph nodes, combine the maximum number of hazards and the maximum potential for defence against them, but in each case the whole system must be viewed as a function of the external environment.

Nowadays it is possible to identify three main groups of disease, with appreciable differences between the industrialized countries and the developing countries:

(i) infections and parasites which infect the respiratory system and the digestive system;

(ii) diseases of the cardiovascular and nervous systems caused by stress, lifestyle and patterns of behaviour;

(iii) tumours.

The data available for purposes of comparison have been compiled primarily for large homogeneous geographical areas and there are still very few, and fragmentary, methodological studies on all aspects of the diseases which affect those who live in cities rather than elsewhere. In Europe, the vast majority of deaths are due to cardiovascular diseases (50.5%), followed by tumours (17%), infection (11.4%) and perinatal diseases (2.5%).

The conditions under which urban populations now live are the result of social, economic and political changes over the last few decades which have obviously had an effect on the environment and on health. There are likely to be even more changes in the future, partly because of the immigration into Europe of millions of workers from developing countries who carry their own diseases, have different constitutions and have a different attitude to immunization.

On the basis of past experience, a first comment can be made regarding the incidence of disease given these changing circumstances. Studies have shown that the main reason why, between 1850 and 1970, the number of deaths from tuberculosis in England and Wales decreased was not drugs, nor the organized immunization programme which was implemented much later during this period. Rather, the decisive reason for the decrease was action to improve environmental conditions, like purifying the drinking water, building sewerage networks, inspections and disease prevention in the food industry, with particular emphasis on milk, and improving conditions of hygiene in homes and neighbouring environments. Similar results were achieved between 1940 and 1955 in the USA with epidemics associated with food, milk and water.

In Europe today the general mortality rate is tending to decrease as is demonstrated by the specific trends in death rates which are typical of industrialized societies, particularly deaths due to chronic and chronic/degenerative diseases. The number of deaths caused by infection and parasites has been reduced to insignificant levels, although the statistics show that they still have not been overtaken by the spread of deaths from AIDS, the future development of which we cannot discuss here.

Trends in deaths from specific diseases are heavily influenced on the one hand by dietary education campaigns, like those conducted in Finland and the USA persuading people to cut down on animal fats, which have drastically reduced the number of cases of angina, and on the other by the widespread adoption of bad habits like the increasing use of tobacco among the female population which has resulted in an increase in the incidence of cancer — not only of the lungs but also of other organs — among women smokers.

The decrease in the infant mortality rate, which has dropped dramatically in Europe over the last 40 years, is due to improvements in health care for women during childbirth and for newborn babies during the first few weeks of life. However, different patterns of behaviour, particularly in towns, are now tending to increase the number of deaths during the first few years of life, with the mortality rate after the age of one increasing as a result of accidents in the home. Children are often left on their own and therefore run more risks: they can fall or inhale or ingest harmful substances, and there are the dangers of poisoning, suffocation, burns, electric shocks and drowning. A comparative study carried out in Italy of the causes of death of children between the ages of one and four showed that accidents in the home now account for 25% of all deaths in this age range compared with 5% some 70 years ago.

The general message, as much for adults as for old people and children, is that the emphasis should be put on the monitoring and prior prevention of environmental hazards in the broadest sense: quality of water, food, the biosphere, the indoor and outdoor environment and the environment at home, at work, at school and in hospitals. In other words a 'welfare' check as a form of primary prevention to prevent damage to healthy people and improvements to secondary and tertiary prevention in order to speed up diagnosis and treatment. Taken together these prevention and early diagnosis measures allow people to live longer than in the past, although this may amount to little more than survival, particularly in the last years of life. This means, as projections to 2001 show, that the percentage of invalids in the population will tend to increase.

One positive example of primary prevention to solve a typical urban health problem without acting on man directly is the EEC Directive 78/611/EEC designed to reduce the lead content of petrol. This was incorporated into Italian legislation in 1981. The lead content of blood donated by a random sample of the population of Turin in 1977 and 1987, with separate figures for men and women, showed that since the new law had come into force the levels of lead in men had dropped by 33% and in women by 45%. Although the lead levels recorded in 1977 did not reveal any pathological effects on the target population it can be assumed that, compared with 1987, they were at risk, although not seriously, from the harmful effects of biochemical and physiological phenomena (inhibition of the delta-aminolaevulnic acid dehydratase of the red corpuscles without affecting the haemopoiesis).

It is difficult to identify the factors of risk with any accuracy since the mutagenic properties do not coincide perfectly with

the carcinogenic properties, as there is an abundance of genotoxic substances in the environment and it is impossible to eliminate them completely. Many arise from natural sources which cannot be monitored and endogenous metabolism. Artificial carcinogens are often a direct effect of our modern way of life. It is extremely complex to distinguish all the risk factors in the interaction between man and the environment unless the particular factor being studied is quantitatively predominant over all the others with which it might be confused. When it is possible to identify, and if possible, quantify the effect of these risk factors (risk assessment), the next step is to control them. This step is risk management which is a matter not so much of scientific know-how but of responsibilities and political will. Even if decisions are based on the information arising from the risk assessment, they will still depend on economic and social factors. Cost/benefit analyses must be done very carefully since there will have to be health education measures and a certain amount of coercion, which is particularly important for risk factors to which we do not expose ourselves voluntarily. These often involve potential damage and long-term risk (like passive smoking which is a particularly important component of indoor pollution). This means that setting quantitative limits for the presence of certain substances in the working environment does play an indubitably important preventive role.

Sometimes decisions taken along these lines result in new sources of cancer, particularly in towns. By setting limit values for lead in petrol we have reduced the level of pollution, which was also responsible for acute intoxication and chronic ailments of the nervous system causing some brain damage to children. However, with the production of lead-free petrol, because higher oil refining temperatures are required in order to retain the explosive properties of the petrol, the process has resulted in a growing production of aromatic polycyclic hydrocarbons which are definitely precarcinogenic. It is therefore necessary to use catalytic converters on motor vehicles in order to prevent arenes and oxides of nitrogen and carbon from entering the atmosphere, otherwise the use of low-lead petrol is a source of more harmful pollution than lead itself.

It is important to include water when considering the specific types of urban disease. Water can have chronic effects on health and since it is a public resource it can affect whole populations in the same way with only marginal individual variations over the whole area in which water from the same

source is distributed. Any slight variations are because the water has passed along particular pipes, because of different consumer habits, and because of the effects of different diets. There are obviously contradictory interpretations of the information available and its reliability according to the methods used, the reliability of official statistics on death and disease, the interpretation of statistics and variables like latitude, longitude, climate, altitude and socioeconomic and cultural circumstances.

After concentrating on the increasing contamination by principally synthetic organic substances, research is now emphasizing the increase in the incidence of cancer caused by concentrations of hydrogenated hydrocarbons, particularly THM, which are formed after chlorination of water. Epidemiological studies of this phenomenon agree that there is a positive link between the presence of micropollutants and the augmentation of the number of tumours in general.

It is extremely difficult to reach satisfactory epidemiological conclusions because there is such a wide difference in the numbers and types of substances concerned. Moreover, there is a decided lack of legislation to prevent hazards arising particularly from infection or large-scale chemical pollution in terms of proper ways of studying, monitoring and preventing forms of micropollution.

Given the current state of research on the relationship between the quality of drinking water and cardiovascular disease, the only conclusion which the experts have been able to reach is that any measures drastically to soften drinking water from public supply networks should be taken with caution. There is an inverse correlation between water hardness and deaths from cardiovascular diseases. We can assume that the oligoelements present in water, like vanadium, lithium and chromium, provide a form of protection, whereas copper, cadmium and lead have negative effects. Various studies have identified an inverse correspondence between the potassium content of water and the death rate from hypertension. They have also shown a direct correspondence between the concentration of chromium and the numbers of deaths due to brain circulation disorders and between the concentration of copper and the numbers of deaths from hypertension.

A classic study was carried out in the USA at Groover in Florida in the Key West Naval Base area. In a period of 20 years deaths from cardiovascular diseases in the civil population

dropped by 47% after the water supply was changed in 1941 from surface water with a hardness of 0.5 ppm to groundwater with a hardness of 200 ppm. The results were also borne out by the effects on the military staff, although their stay at the base was usually of more limited duration.

Studies now being carried out in the USA in Wisconsin on a much larger scale have identified a relationship between the consumption of chlorinated water and high blood cholesterol levels and low density lipoproteins in the blood, with a consequent risk, which remains to be proven, of cardiovascular lesions.

USA legislation has achieved interesting results by setting maximum overall contamination ceilings for each specific water-course and allowing old and new industrial and agricultural undertakings to trade 'pollution rights', provided that at no time these binding limit values are exceeded and the life of the water-courses is threatened. Another encouraging example is Danish legislation which has brought about a net decrease in pollution from nitrates used in farming by establishing rules to regulate quantities and methods of distribution and also by imposing a tax on the use of nitrate fertilizers, which has drastically reduced surplus consumption.

It is not possible at present to set quality standards for the presence of viruses in drinking water and, from an epidemiological point of view, we still do not have sufficient information on the relationship between the viruses isolated in drinking water and the cases of disease which may be caused by them. More extensive study is required on the incidence of the hepatitis A virus, the Norwald virus and rotaviruses with better concentration techniques than at present. The short-term mutogenesis test and particularly the Ames test play a key role in identifying the presence of mutagens in drinking water and identifying sources of mutagens, the chief of which is undoubtedly the use of chlorine as a disinfectant.

The presence of mutagenic substances in drinking water can potentially affect body cells (malign tumours) and germinal cells. However, it is not yet clear whether the genotoxicity revealed in tests on cells is also valid for tests on animals as a whole.

The substances which are found with greatest frequency and at highest concentrations in drinking water, e.g. chloroform in surface waters or trichloroethylene, perchloroethylene, and

carbon tetrachloride in polluted groundwater, are only slightly genotoxic and it is open to question whether or not they are carcinogenic since there are still doubts about whether they can cause damage to man.

In conclusion, after considering all the information, namely the positive results of mutagenesis tests on drinking water *in vitro* and the results of epidemiological studies on the carcinogenic effects of certain micropollutants in water, the experts advise that the risk of mutagenic substances in drinking water be kept to a minimum by using programmes and techniques designed to limit and monitor the presence of these micropollutants in water. Various studies over the last 10 years have shown that mutagenic activity has increased with the chlorination of the waters of the Rhine, and, too, with the ozonization of the waters of the Rhine and the Meuse. Studies of water distribution networks have shown that the use of pitch-based paints on tanks and to protect pipelines results in the release of mutagenic and carcinogenic substances like polycyclic aromatic hydrocarbons (PAH). As a result extensive mutagenic activity has been recorded in the particulate matter in parts of the distribution system where the water is not running continuously, as happens in reservoirs with a large capacity which are typical of an urban water supply network.

The main classes of carcinogenic compounds present in water which may be introduced into the water supply network as a result of discharges, accidents, direct application or tipping are:

(i) oil derivatives (oils, PAH, naphthalenes and kerosene) from refineries, petrochemical plants, oil tankers, service stations, asphalted roads and pesticides;

(ii) coal derivatives (pitch, tar, creosote, anthracene, polycylic aromatics from coal furnaces, tar distilleries and wood processing plants);

(iii) aromatic amines and microcompounds (benzidine, 4-aminobiphenyls, β-naphthylamines) from dye-works, the rubber industries, the textile industries, the pharmaceuticals industries and the plastic industries;

(iv) pesticides from the industries which produce them and from their use in agriculture.

The widespread use of plant health products has led to increasingly frequent pollution of both surface water and groundwater. The toxicological risk associated with the presence of pesticides and herbicides in drinking water can have

long-term effects on health. Regular absorption of small doses, even though they may not be toxic on their own, does lead to accumulation over long periods with the consequent risk of tumours, and irreversible damage to certain tissues, for example, neurotoxicity caused by organophosphorous insecticides and teratogenic effects on reproduction.

City dwellers are the most highly exposed to the combined effects of all pollutants, mutagens, plant health products and carcinogens used in the materials of which pipelines and water tanks are made, through a combination of aquifers, dispersal, pipelines, discharges and accidents, all of which are made more dangerous by the fact that they all interact. Nor should it be forgotten that, even in recent times, chemical and physical contamination has led to acute cases of pollution, in the Rhine, of dramatic proportions.

It is also essential to monitor overall levels of radioactivity on a continuous basis upstream of the points where surface water are taken, not only in catchment basins which include nuclear power stations but also downstream of large urban and industrial communities because of the possibility of effluent of radioactive isotopes used in hospitals, research laboratories or particular industries accidentally ending up in the sewers. It is also essential to monitor continuously other organoleptic, chemical and physical factors in water which may be hazardous (nitrates, nitrites, manganese, copper and zinc) or toxic (cadmium, cyanide, mercury and lead). Modern scientific methods can be used to evaluate risks before they occur, provided they take proper account of the basic differences between water supply networks which use groundwater and those which use surface water.

Air is also a means of spreading pollution. We should bear in mind that even 20 years ago slightly less than one-tenth of all world emissions of fine dust were of human origin (Hidy G., 1970). These were sulphates from SO_2, nitrates from NO_x and organic aerosols from steel plants and incineration plants.

There are natural emissions occurring all the time over immense areas, while forest fires and volcanic explosions emit CO_2 and H_2S over more limited areas. Man-made emissions are estimated to cover between 5 and 10% of the total surface of the globe, and occur particularly in those countries with a highly developed GDP.

Airborne pollution may arise from industrial plants, fixed sources of heat production, mobile sources and pollution aris-

ing from sewerage, solid urban waste, hospital waste, stock rearing and agricultural practices.

If, after these general remarks, we examine a concrete urban situation we see how the carbon monoxide typically emitted by motor traffic constantly throughout the year becomes increasingly concentrated as the temperature rises. This will depend not only on seasonal or day-to-day variations but also on the microclimate created by specific urban conditions. For example, asphalted roads cause convection currents to rise, thus increasing the spread of pollution. This results in a mixed layer in which pollutants are more widely dispersed. This means that there is more dispersal of pollutants in summer than in winter. Concentrations are inversely proportional to the extent of the mixed layer. However, solar radiation, which reduces the concentration of primary pollutants emitted at ground level, tends to cause a series of photochemical reactions which increase the concentration of NO_2, aldehydes, ozone and organic peroxides thus changing the results of individual sampling over the seasons depending on the time of day samples are taken.

Concentration depends on wind speed, on the type of pollutant and on whether it was emitted evenly over the area being surveyed as SO_2 and O_3 or mainly along roads as CO and NO.

Inside conurbations, motor traffic is the chief source of NO and NO_2 pollution, but it is important overall to identify and quantify the origin of pollutant produced in towns and in the environment around power stations, around industrial plants which incinerate solid urban waste and special waste and around civil and industrial heating plant. As a result it is necessary to study these various aspects according to the actual nature of each specific urban system and to link them with local weather conditions, wind speeds, wind frequency and direction, seasonal wind patterns, fog, atmospheric turbulence, atmospheric pressure, ultraviolet radiation, humidity and precipitation.

Listed below are those pollutants which occur in enormous quantities and cause, or help to cause, many of the most serious diseases affecting people in urban areas.

Particulates These are a mixture of dust, fibres and liquid particulates of various compositions, formed of carbon, glass, silicon, metals and synthetic fibres. Liquid particulates may be composed of liquid pollutants or gaseous pollutants dissolved in water, like SO_x and NO_x. Most of these particulates derive

from the combustion of oil derivatives. A particulate may also be a carrier of other pollutant substances and may cause toxic effects or irritation in the respiratory tract.

Oxides of sulphur (SO$_x$) If associated with particulates these may produce pathological effects deep down in the respiratory system. Epidemiological studies in New York have shown that the death rate increases once the daily ingestion of dust and SO$_2$ reaches a concentration of μ8/m³.

Nitrous oxide and nitrogen dioxide These convert haemoglobin into metahaemoglobin. The inhabitants of Los Angeles have metahaemoglobin levels of between 5.2 and 2% compared with normal levels of 1%. At doses of 100 ppm these can have serious effects on the respiratory system and at levels of 500 ppm they can cause pulmonary œdema and death by asphyxiation. The effects of NO$_2$ are not immediate but usually develop many hours after the source of exposure has disappeared, causing damage to the macrophagic system, reducing phagocytary activity, causing pulmonary œdema and possibly peroxidation of the lipids.

Carbon monoxide This is particularly dangerous because it has no smell, no taste and no colour and causes no irritation to the respiratory system. In high concentrations, however, it can cause asphyxiation by forming carbonmonoxyhaemoglobin (COHb), the effects depending on the percentage of COHb in the blood system and on the time of exposure. CO values of around 100 ppm (16% COHb) may be achieved, for example, in unventilated tunnels full of motor traffic. These concentrations cause vertigo, headaches and general numbness. At higher concentrations (200 to 700 ppm) the victim gradually loses consciousness and dies (CO is often used to commit suicide). When assessing the percentage of COHb in individuals exposed to carbon monoxide there is considerable interference from active and passive exposure to tobacco smoke.

Carbon dioxide This is an essential ingredient for animal and plant life. Increased concentrations may affect ambient temperature, shutting out infra-red radiation and causing the greenhouse effect.

Hydrocarbons These are emitted by motor vehicles, oil refineries, oil derivative distillation plants and power stations. Aliphatic and alicyclic hydrocarbons are not a public health hazard whereas aromatic hydrocarbons cause irritation to the respiratory tract at concentrations of only a few tens of ppm. Aromatic hydrocarbons, particularly if polycyclic, can cause

chronic tumours of the respiratory and digestive systems. In people working with benzene, used as a solvent, the formation of red blood cells in the bone marrow may be reduced and leukaemia may result. Toluene and xilyne emitted by motor vehicles and industrial plants — in Los Angeles concentrations are 0.1 ppm — are suspected of causing cancer. Both solid and liquid particulates may become carriers and increase the level, intensity and period of contact with the mucous membranes of hydrocarbons which are known to be or suspected of being carcinogenic. In particular, benzopyrene, which is present in very small doses in the natural environment, arises in much greater quantities from cigarette smoke and is the main cause of indoor pollution, and exposure at work. Most hydrocarbons are not in themselves carcinogenic but are precursors in that they are transformed in the liver into an epoxide derivative, which in turn bonds with the nucleic acids in the target cells and starts off the cancer process.

Lead We have already mentioned this element. Even though its concentrations in the environment are now small they can still affect the biosynthesis of EME. Exposure to lead in the atmosphere, and to a lesser extent in food, carries on throughout life and may have not only biochemical and subclinical effects but can actually cause disease. In the most serious cases and at high doses it can cause chronic nephritis, diseases of the peripheral nervous system and brain disease.

Vanadium This is emitted both naturally (marine aerosols and dust from erosion) and artificially (steel industry and refineries and as an impurity in crude oil and in organo-metallic porphyrin compounds). Vanadium is also present in trace quantities in foodstuffs. It accumulates in the heart and the spleen, its toxicity increasing the greater the degree of oxidation, which reaches its maximum levels in vanadium pentoxide (V$_2$O$_5$). Damage to the respiratory system is presumed to be caused by the interaction of the metal with the macrophages present in the pulmonary alveoli and the consequent reduction of the defence system.

Secondary pollutants consist of sulphur, nitrogen, inorganic carbon and organic carbon. After oxidation they become SO$_3$, H$_2$SO$_4$, MeSO$_4$, NO$_2$, HNO$_3$, MeNO$_3$, unstable radicals, acids, carbonyls and peroxides. A study carried out by P. Carlier *et al.* in 1966 showed the oxidizing effects on aldehyde molecules of specific urban atmospheres compared with rural atmospheres. This process may take several days in the atmosphere of rural areas where oxidizing effects are slight but only a few

hours in densely populated urban areas. Concentrations differ considerably from a few mg per m³ (ppb) in rural areas with sparse populations to levels of hundreds of ppb (which is the sum of the carbonyls measured in the survey) in samples of urban air. The difference is due to the presence of radicals which serve as catalysts in reactions which, without them, would be extremely slow. The study of photochemical smog (or 'Los Angeles smog') showed that this depends on primary pollutants emitted by motor traffic (NO, NO_2 and hydrocarbons) which because of photochemical reactions caused by solar radiation produce secondary pollutants which are chiefly ozone, peroxyacetylnitrates (PANs), nitrolefins, NO_2, aldehydes and ketones.

The effects on man are irritation of the mucous membranes and the conjunctiva which tend to occur more when the weather is hot and photochemical smog is formed which remains in the atmosphere up to a height of a few dozen metres. This is due to the presence of ozone and PANs, and other substances typical of photochemical smog. Formaldehyde too (whose percentage distribution in the atmosphere is extremely high) does not only cause toxic and allergic reactions but at high concentrations can have carcinogenic and mutagenic effects. It is also potentially hazardous if absorbed in minimum doses but over a long period of time.

There are no boundaries to contain atmospheric pollutants and they may travel thousands of kilometres from the source of emission.

Geographic variables have a considerable effect on levels of exposure to airborne pollutants, while environmental and individual variables may often cause confusion in the assessment of human exposure to airborne pollutants. These factors include smoking habits, diet and exposure at work. Short-term effects on health range from minor troubles and irritations to specific toxicity, acute respiratory infections and death. Long-term effects include chronic bronchitis, lung cancer and death.

The vast majority of pesticides are used to protect crops, including flowers, and foodstuffs in storage, and in stock breeding. Other pesticides are used in towns, industry and in the home (see indoor pollution) against pests which infest buildings, public markets, campsites, warehouses, foodstores, gardens and ornamental plants, the paper, wood and textile industries, for clearing grass from roads and railways, for treating domestic animals and in delousing products for humans. The risks of acute intoxication from pesticides used for these purposes in urban areas are generally equivalent to the risks from the professional use of pesticides in agriculture and industry.

Apart from workers who repeatedly absorb these products through their lungs or through their skin, all consumers are at risk from chronic intoxication through the food chain. This does obviously not apply specifically to city dwellers but to the population at large.

City dwellers are certainly much more affected by indoor pollution than the rural population since they spend most of their time in enclosed environments at work, studying, at home or for recreation purposes. Moreover, this category includes a much higher proportion of those sections of the population which are most sensitive to pollution: the sick, the elderly and children who spend virtually all their time indoors.

Individual exposure depends on the concentration of pollutants in these various indoor environments but is also proportional to the time spent in them. Much of the contamination in enclosed environments depends on the building materials, the furniture, and the fittings and materials used for the job or the hobby, and the possibility of eliminating or diluting them depends on the rate of exchange of air between indoors and outdoors. In some modern buildings, which use modern building technologies, the exchange of air in winter is half that in a conventional house. Enclosed environments also include means of transport in which urban populations spend some 5% of their day: cars, buses, trains, aeroplanes and underground railways (the last of which relies principally on the piston effect of the trains to change air in the tunnels).

The external component of indoor pollution depends on atmospheric pollution, which we have discussed at length. The internal component depends on human activity (CO_2, CO, aldehydes, mercaptans, methane, water vapour, bronchial aerosols, etc.), cooking food (NO_x, CO), combustion (NO_x, SO_2, CO, CO_2, dust, tobacco smoke), insulation panels (asbestos, formaldehyde, phenol), furnishing (wool, cotton), microorganisms, products in general use like solvents, detergents, pesticides, propellants, deodorants, stain-removers, cleaning products and office machinery (solvents, O_3 and dust).

Tobacco smoke, NO_2 and CO are among the most important and harmful indoor pollutants. The VOC (volatile organic

compounds: compounds which belong to different organic classes but have the common characteristic of being able to exist in the vapour state at ambient atmospheric temperature) and formaldehyde, which is the most common of them, include hundreds of other important indoor pollutants. Certain symptoms like inflammation of the primary respiratory tract, drowsiness and migraine are more frequent in working environments with mechanical ventilation than in those with natural ventilation.

According to research carried out at Sterling, these syndromes are due to the formation of indoor photochemical smog in which the ultraviolet radiation from fluorescent lamps on indoor VOC acts as a catalyst.

3

THE URBAN AREAS OF EUROPE AND THEIR ENVIRONMENT

Vera SQUARCIALUPI
Journalist, former Member of the European Parliament

WHAT IS A CITY?

Cities and their surrounding urban areas are artificial systems which have undergone radical changes as a result of man's influence. Yet they are also living organisms embracing all types of people working in a variety of different areas both to ensure survival and to promote well-being. In fact, virtually half of Europe's population lives in urban areas and this proportion is on the increase.

However, economic growth, which is the root cause of today's urban growth, is being questioned more and more, particularly from the point of view of the environment and quality of life. In fact, this artificial urban ecosystem is like a huge black box: energy and raw materials are fed in one end and finished products and waste come out the other. The two most important elements are supply on the one hand and waste disposal on the other. This applies in particular to huge conurbations, which the political and administrative authorities find it very difficult to keep under control.

This input and output determines to a large extent the quality of life in cities and their surrounding urban areas, particularly for those people who tend more and more to be classified according to their particular needs in terms of age (young people, old people), sex (women), physical and mental state (the handicapped), origin (immigrants) and income (whether they live in residential areas or the suburbs). The special problems of these particular social groups are additional factors which determine whether a city is a pleasant place to live and a place where it is possible to enjoy a whole range of different rights, including the right to a cleaner and healthier environment.

The flows of energy and raw materials, which we mentioned earlier, are the consequences of human activities, which are not a static feature of any city but increasingly tend to undergo

rapid and radical changes. Nowadays the labour force is being replaced by capital, while at the same time there is a tendency to decentralize production, which has a profound effect on society.

One of the more immediate problems is the possible decentralization of public and private functions, like education and social and cultural activities. This will be a central feature of the Community's regional policy in the future. But there is also the problem of disused land. In its report on the environment in urban areas the European Parliament maintains that 'the re-using of disused land may determine the future development or urban areas and, if controlled and guided, should help to provide city-dwellers with guarantees that their environment will be developed in accordance with their real needs and the changes taking place in society'.

POLLUTION AND URBAN AREAS

The energy and raw material input into cities re-emerges in the form of finished products. These ensure the city's survival, and to some extent also its well-being, but leave behind three main types of pollution: one which remains entirely within the city — noise; one which remains chiefly within the city — atmospheric pollution; and one which is exported almost entirely outside the city — waste, thus creating new, and sometimes very serious problems in urban areas outside the city, or away from the city altogether. It is these same areas, moreover, which have to bear the heavy environmental burden of generating the energy which the city requires in hydroelectric, thermal and nuclear power plants.

The combination of all these different factors determines the extent and nature of environmental problems, and the quality of life in the city and its surrounding urban area.

In the past the European institutions have paid little attention to the specific problems of urban areas undergoing radical changes. This neglect is certainly not the result of lack of awareness of the problem. Back in 1973, in fact, the first environmental action programme, which marked the beginning of European environment policy, clearly identifies the existence of a problem in urban areas which then intensified, so that by the 1980s it had reached very serious proportions. The programme stresses in fact that 'the functioning of the common market has intensified the problem... of the optimum geographical distribution of the population and activities'. It goes on to say that 'freedom of movement of persons and capital, the structural changes, particularly in agriculture, the rapid transformations of a technological, economic and sociological nature' all help to create or intensify regional imbalances between urban and rural areas.

The programme also refers to the often uncontrolled growth of urban areas, and states that even rural areas are undergoing radical transformation and that in some cases they align themselves on urban areas and are then quickly swallowed up by them.

These references in the first environmental action programme to what today are generally known as the problems of Europe's urban areas, were followed by some in-depth analysis but the solutions proposed go no further than the Commission's proposal to study the main problems in a working party of national experts, which, in turn, was to work closely with the Permanent Committee on Regional Development.

The second environmental action programme four years later, i.e. the 1977 programme, also covers the specific topic of urban areas, but principally in the context of the proposed directive on environmental impact assessment, one of the Community provisions which was to do most to tackle the various problems which were now becoming increasingly apparent in highly populated areas. The programme also stated that the Commission would present the Council with a proposal for a decision on a research programme on the development of large conurbations and their environmental impact. This programme was to be implemented within the framework of joint action which, in turn, would be designed to coordinate various research projects on urban development being carried out in the Member States. The programme was to run for two years and would aim to produce a comparative study of the causes, stages and impact of the development of large conurbations within the Community.

The calls made in the programme resulted, in 1980, in only one project, although a very extensive one, on 'Urban problems and regional policy in the European Community'. As the title indicates, the problem was examined in the context of regional policy with no specific reference to environment policy. On the other hand, a more recent project, in 1988, entitled

'The future of the major European cities' concentrated rather on the social dimensions of European integration.

NOISE

The second environmental action programme of 1977 was the basis for measures against noise. It contained proposals for a policy to tackle the consequences of noise on physical and mental health, a concern which in the following action programme — the third — was taken up in the form of questions on the rather ill-defined economic effects of noise, leaving it rather unclear therefore whether research should be carried out into the health problems — because damage to hearing is often irreversible — or whether the main concern was the high cost of prevention.

In actual fact, Community legislation on noise was confined to tackling some of the common sources of noise like cars, motorcycles and household appliances and some of the less common but noisier sources like aircraft, earthmoving equipment, pneumatic drills, cranes and lawnmovers. In addition there was also the somewhat controversial directive on noise protection at work. There was some lively discussion on this directive within the European institutions, the outcome of which was considered unsatisfactory by workers' representatives.

After this first series of measures against noise, restricted as we have seen to the sources of noise, provision was made in the fourth environmental action programme (1987-92) that environmental policy on urban areas should take account of the need to propose 'a programme setting out the general framework for a body of measures to be taken at different levels to combat noise (including quality objectives, zoning matters, noise-related charges, etc.)', although the programme recognizes that these objectives are ambitious because of limitations on staff resources. Staff shortages are an all too frequent and a virtually endemic problem in the Commission. Complaints are made at all possible levels but it is only by gradually making the European institutions more democratic and having Community policies carried out at different levels ('subsidiarity') that the situation will improve.

From the principles laid down in the Single Act, which are directed primarily towards preventing environmental damage and integrating environment policy into other Community policies, and from the content of the fourth environmental action programme, it is to be hoped that measures will be taken to tackle the certainly more difficult problem of establishing quality objectives or guiding principles as a basis for limiting environmental noise as far as possible in densely populated areas or in areas where certain types of activities are carried out.

ATMOSPHERIC POLLUTION IN TOWNS

Atmospheric pollution arises from the processes whereby the raw materials and energy fed into a city become its finished products and waste. Most of this atmospheric pollution remains within the urban area but it can easily be carried far away as has been clearly demonstrated by the problem of acid rain and the depletion of the ozone layer. The dangers of urban pollution are becoming more and more evident day-by-day; it is one of the most serious problems affecting the cities of Europe and seriously threatens the health of city-dwellers. Illnesses range from respiratory diseases to cancer, although the 'Europe against cancer' programme is attempting to combat the problem by changing individual patterns of behaviour.

However, atmospheric pollution also causes serious damage to natural resources, like trees, to monuments and to buildings in general and altogether has been held accountable for damage amounting to between 5 and 7% of the GDP of the Member States.

The cities of Europe certainly provide an ideal opportunity for observing various forms of atmospheric pollution, starting with London in the 1950s, where smog (a mixture of sulphur dioxide and dust) caused the death of more than 4 000 people. In recent years smog alarms have interrupted the activities of entire regions of the Federal Republic of Germany. When the concentration of atmospheric pollutants exceeds safety thresholds, a level-one state of emergency is declared, which means banning private cars not fitted with catalytic converters, turning domestic heating down to a maximum of 18°C and requiring industry to use low-sulphur fuels. In Milan too, which is considered to be one of the most polluted cities in Europe, the concentrations of harmful substances in the atmosphere are quite frequently far in excess of thresholds set by law. Yet measures to reduce the dangers of pollution on a

permanent basis have proved inadequate. Even banning traffic from city centres has had the effect of transferring congestion and pollution to the periphery. Furthermore, motoring offences — particularly illegal parking, which does more than anything else to slow down public transport — virtually always remain unpunished.

Although the Community legislative framework contains an abundance of measures covering production, fuels, and transport, it has to be admitted that the 1973 oil crisis would have provided an important opportunity for adopting more environmentally friendly energy options, had the European Community not let it slip.

Identifying the use of coal and nuclear energy as the solution to the problem was the result of pressures at industrial and national level, and no thought was given to environmental impact and safety, as the various nuclear accidents, particularly the Chernobyl disaster, have clearly demonstrated.

Energy saving and scientific research into the use of alternative forms of energy were not, therefore, given the priority they deserved and this has resulted in desperate attempts to make up for lost time with attempts to improve the ever deteriorating air quality about which there are some strongly divergent positions in the EC Council of Ministers. We are referring in particular to the directive on reducing atmospheric pollution from large combustion plants and the staunch resistance to measures on motor vehicle emissions and the lengthy legislative procedures which the Community institutions had to go through in that connection. It was primarily the firm position adopted by the European Parliament, with the support of the environmental organizations, which made it possible to dislodge the major industrial and national interests which governed these two sectors, convincing the Commission not to review or water down its proposed solution to the problem.

URBAN WASTE

Atmospheric pollution is one of the most serious consequences of urban deterioration, but it is certainly not the only one. It is closely followed by the problem of urban waste and toxic and dangerous industrial waste.

It has been calculated that each European citizen daily produces approximately 1 kilogram of domestic waste.

A large proportion of this waste is taken to tips or incinerators outside the city entailing substantial environmental and energy costs, not to mention the economic and social costs. There is always considerable opposition from the people living in the neighbourhood of the selected site. Apart from solid urban waste, there is sewage, which is often not purified, or only partially purified, before being discharged from the city to pollute surface waters, ground water, and eventually sea water, causing eutrophication and killing living organisms in seas and rivers.

We should therefore welcome the Commission's proposal for a directive on the treatment of urban effluent, which remedies a serious omission and which could help to repair the disgraceful record of the European Community in this area.

Coming back to the idea of the black box, cities absorb from the external environment natural resources like air and water, but also raw materials, food and energy in the form of fuel, and then concentrate all these resources in a very small land area before discharging into the external environment enormous quantities of waste and pollutants in even more concentrated forms.

From an environmental point of view this system is extremely unstable and very firm limits must be set up in order to contain the damage and there must be strict preventive measures. But primarily there is a need for policies directed towards a new development model which takes the environment as a resource to be respected and used wisely. In its resolution on the environment in urban areas, the European Parliament considers that 'the problem of urban deterioration originates in a series of complex causes which can be attributed to a mistaken conception of economic development, which gives priority to certain narrow interests at the expense of the community's quality of life'.

As regards primarily urban waste, credit should be given to European environmental policy which, back in 1975, called for a waste management policy covering much more than just the final disposal stage. The Commission's new strategy in fact is to limit waste, recycle waste and use waste profitably at the final disposal stage. It also includes transporting waste and restoring waste tips which have been managed in the past.

There is also an EEC directive on pollution from municipal solid waste incineration plants.

On the subject of waste, the Court of Justice of the European Communities has on two occasions clearly put environmental interests before the principle of free trade, which is the corner-stone of the internal market. One such case was the judgment on the restrictions imposed by the Danish authorities on the importation of drinks in metal containers, because they did not have adequate facilities for disposing of an indefinite number of such containers. In its judgment the Court of Justice ruled that environmental protection was more important than free trade. Similar principles inspired the judgment concerning the municipal authorities of Cinisello Balsamo in the province of Milan, which banned plastic packaging within their municipality because, as there was no local recovery or recycling plant, it would have an adverse impact on the environment.

THE URBAN ENVIRONMENT AND TRANSPORT

The 1973 oil crisis would also have been a perfect opportunity for the European Community to adopt clearer transport policies and to abandon the policy of giving equal status to public transport and private transport, and to rail transport and road transport, since road transport is chiefly responsible for nitric oxide pollution, which in turn is the main cause of acid rain. The increasing volume of road transport was also considered in the report by the Commission's task force on the environment and the internal market as likely to be the most important environmental issue in Europe after 1992.

This perfect opportunity to adopt policies aimed at respecting the environment and promoting general well-being was not taken, so now certain Member States and many of the major cities of Europe are having to take emergency measures.

Furthermore, for some time now the European Parliament has been making specific calls for bolder policies to make roads safer, to promote the bicycle as a means of transport, on a charter of pedestrians' rights and on expansion and improvement of the rail network. It is worth remembering that in all countries of the Community the railways have to pay for all the infrastructure they need while road users do not.

Now that traffic in towns is frequently paralysed, the various cities of Europe need to persuade more people to use public transport. This means that more must be done for pedestrians and this in turn obviously entails reorganizing cities and providing more safety facilities, like pedestrian islands, reducing atmospheric pollution and noise, and reducing speed limits in residential areas to the 30 kph limit now adopted in some European cities.

Opinions differ widely within the Community institutions on the subject of speed limits. In some countries, like Denmark, the speed limit on motorways has been 100 kph for some time now and is generally accepted, so Denmark does not intend to relax its limits. Other countries, like the Federal Republic of Germany, prefer to recommend motorway speed limits rather than to impose them.

Promoting the bicycle as a means of transport has already been the subject of measures taken by the authorities in many important municipal areas of Europe. This requires cycle paths, special traffic lights, signposting designed to improve safety and special parking facilities. Many non-governmental organizations concerned with developing countries also see the bicycle as the ideal mode of transport, over short distances, for improving urban mobility and for avoiding the excessive use of private transport common in the industrialized countries.

Because of the heavy pollution caused by road transport, it is to be hoped that the Member States will not be slow in implementing the directive on pollutant emissions from motor vehicles and that tax incentives will be provided to encourage the use of catalytic converters before the deadline imposed by the EEC directives; indeed this suggestion has already been made by the Commission. There is some concern however that if in the future taxes are harmonized throughout Europe this could have the effect of reducing the price of petrol. The price of diesel fuel, which is particularly low in some countries, should be made less competitive in view of the pollution caused by diesel engines and in order to encourage fuel savings.

The report by the Commission task force on the environment and the internal market also contains some interesting ideas on expanding markets and policies to help less developed regions achieve substantial economic improvements without harming the environment. It is essential therefore to change

current transport policy and to promote less polluting modes of transport, to restrict the number of vehicles which each family may own and to charge tolls for access to areas, principally urban areas, where there is a serious risk of atmospheric pollution and noise.

Another problem will be to halt the construction of new motorways. It has been estimated that over the next few years, in the Community Member States alone, an additional 70 millions cars will be added to the present total of 200 million, and this increase should not be encouraged.

INDOOR POLLUTION

For some time now, air quality in urban areas has not been the only cause for concern or the only topic which requires increasingly strict regulations, followed of course by proper implementation. Steps are now being taken to identify and study the particular forms of pollution inside buildings: homes, offices, shops and hotels. These buildings are not processing toxic or dangerous substances but there are many elements of danger and pollution. Indoor pollution became an area of discussion after an epidemic which broke out in the USA in 1976 after a meeting of members of the American Legion in a hotel in Philadelphia. In all, 182 people were affected, 30 of whom died, and as a result this rather obscure disease became known as 'Legionnaires' disease'.

Inside buildings, which is where citizens of industrialized countries spend 90% of their time, the microclimate is determined by a number of physical factors like temperature, humidity, air speed, lighting, noise and ionizing and non-ionizing radiation. In addition, there are biological factors like spores of fungi, bacteria and viruses. There is also a lot of dust, particularly asbestos dust, artificial fibres and pollens. But by far the most predominant pollutants are chemicals and the long list includes, in order, formaldehyde, nitric oxide, carbon dioxide, carbon monoxide, polycyclic aromatic hydrocarbons, ammonia, and polychlorinated hydrocarbons. In addition there may also be freon, insecticides of various kinds and cleaning products, and none of these come only from outside. It is becoming increasingly difficult therefore to think of one's own home or of other places previously thought to be safe as havens of refuge from the serious effects of pollution expe-

rienced in urban areas, particularly in buildings near plants producing pollutant materials or near main traffic arteries.

Air-conditioning plants are a special problem. As buildings become larger and hence the ratio between the external surface area and the internal volume decreases, it becomes increasingly difficult to renew the air, and this often depends entirely on the air-conditioning plant. However, for reasons of energy-saving, which is primarily to limit operating costs the fresh air exchange rate may be cut to 5 m^3 per minute instead of being kept between 15 and 20 m^3 per minute as it should be.

Although the Joint Research Centre at Ispra has begun to study the 'sick building syndrome', the European Community has still not adopted a policy to combat indoor pollution. However, there is already an EEC directive which specifies requirements for building materials, stating that they should not emit toxic and dangerous gases, particles or dangerous levels of radiation.

And since tobacco smoke is considered one of the major indoor pollutants, it is worth mentioning the recent Council resolution on banning smoking in premises or buildings open to the public.

The European Parliament has also adopted a resolution on the quality of air in enclosed environments, calling on the Commission to present proposals for a directive listing substances and products which should be restricted or forbidden, including cleaning products like detergents, stain removers, deodorants and insecticides. It is also calling for minimum health standards to be set for the maintenance of buildings and for the planning, construction, operation and maintenance of air-conditioning plants in the interests of public health and to meet the requirements of the common market. The proposals should also include quality standards for specific enclosed environments like kindergartens, schools, gymnasiums and hospitals.

URBAN AREAS AND CONSUMPTION

Urban areas are the ideal laboratory in which to test the shortcomings and benefits of competitiveness as governed by the principles of the Single Act. In this connection urban areas are the places most likely to accept high-quality products, particularly environmentally-friendly products, precisely be-

cause the declining quality of life in cities has made city-dwellers more sensitive to the problems of the environment and natural resources and more likely therefore to consume products which cause less environmental damage.

In the past, cities had thriving markets where products were sold in large quantities. They created needs and they also created the throw-away society, paying no heed to the environmental costs.

Today, however, the huge markets and considerable purchasing power of urban areas are being used to demand quality products which take into account the environmental dimension. Thus, it is precisely in urban areas that the environmental labelling idea being proposed by the Commission in order to arrive at environmentally-friendly industrial and organic products which state their area of origin is most likely to be sucessful and to make a major impact in changing consumer habits.

It should also be possible to verify whether in urban areas, as many fear, freedom of movement of services, capital and goods is likely to cause more environmental damage or whether competitiveness will bring about a qualitative change, in terms of more respect for the environment. We know that in some cases production has been transferred from countries which are governed by stricter environmental legislation, or where this legislation is perhaps more strictly applied, to countries where rules are less strict. This arises because for the moment policies are still too divergent, as are monitoring systems. It would be nice to think that one day there will be a European monitoring network to check that environmental conditions are the same everywhere. This would remove one of the obstacles to competition, namely that production activities are distributed evenly throughout the Community, thus ensuring that the quality of life is the same for citizens of Europe everywhere.

However, urban areas are very fragile ecosystems and we must not run the risk of seeing their delicate balance destroyed, although it has already happened in some cases. As atmospheric pollution increases and the threshold limits prescribed by European regulations for the concentrations of pollutants in the atmosphere are exceeded, plants are forced to curtail or to scale down their production activities and this severely hampers fair competition.

Urban areas should therefore prepare themselves culturally, but also structurally, to bring about and develop high-quality competitiveness directed primarily towards environmental quality. The alternative is to be shut out from the market with all the economic, social and even environmental consequences which would result from it.

ENVIRONMENTAL EDUCATION AND TRAINING

Measures to support the policy to prevent and limit environmental damage at source, as set out in the Single Act which amends the Treaty of Rome, cannot be left to the occasional efforts of individuals or organizations. The Council decision on a programme to prevent environmental damage by education and training schemes could thus provide the opportunity, using the education system, to change individual patterns of behaviour to encourage protection of the environment, and to make the public aware of all the different problems affecting this area, which is so important, and even vital, for the human race.

Obviously these public awareness campaigns will have to be given a European slant in order to concentrate on the environmental problems of the Community. The Community is also the ideal forum for tackling problems and dealing with events which go beyond the scope of the Community's geographical area, e.g. relations with the East European countries and with international organizations like the OECD and the UN.

The Council decision states as an important objective of education and vocational training, individual and collective awareness of the environment as the common heritage of humanity: of the importance of ecological balance; of the need to use natural resources wisely; of the impact of human activity on the environment and finally of the right to a living and working environment where health is not at risk. The aim is basically to promote awareness of the contribution which each individual can and must make when consuming goods and using services.

The programme contained in the Council decision sets out a basis for generating a new collective consciousness which will also influence policies on urban areas and help with their implementation. All the different environmental problems fac-

ing our cities could be solved, to some extent at least, just by changing our attitudes to public transport and the selective collection of household waste for example.

It is also essential when providing technical training for specialists who will be tackling small- and large-scale environmental problems at local, regional and national level to instil in them special environmental awareness. The problems they will be solving are generally new problems which demand not only technical and administrative know-how but also conviction, enthusiasm and creativity, and these are more likely to result from individual and collective awareness of the environment.

This enhanced awareness is also a way of guaranteeing the future of our cities and their surrounding urban areas and putting a stop to the deterioration and pollution which is endangering their inhabitants and in some cases making them downright uninhabitable.

Younger generations are much more aware of environmental problems and often suspicious, distrustful and even scornful of cities, even though they take full advantage of all their facilities. They have learned to spurn their cities and to get away as often as possible, as is demonstrated very clearly by the massive exodus every weekend or at holiday times. This growing hostility towards cities is reflected in the many 'environmental refugees', mainly young people, who have decided to move away from urban areas, not only for economic reasons but also through choice of lifestyle, in order to reclaim for themselves a natural environment with all its advantages, thus acquiring the right to a clean environment on an individual basis.

Far greater political and administrative emphasis on urban areas by the European Community institutions and far greater awareness by city-dwellers and city administrators would not only halt urban deterioration but would help to maintain the role which cities have played for centuries, and in some cases for millennia, as centres where men and women engage in cultural activities, make laws, develop their community and generally move forward together on the widest possible range of fronts.

4

SOME CHARACTERISTIC FEATURES OF THE EVOLUTION OF CERTAIN EUROPEAN CITIES

René SCHOONBRODT

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INTRODUCTION

Getting to know European cities is still a complicated business. Studies are either rare, out of date or incomplete, and are not widely available or simply inaccessible. One difficulty is the incompatibility between the administrative limits (which also form the framework for the collection and processing of statistics) and the morphological limits of urban areas. In view of this, DG XI is currently supporting research which should allow the various obstacles to knowledge of the European urban phenomenon to be removed.
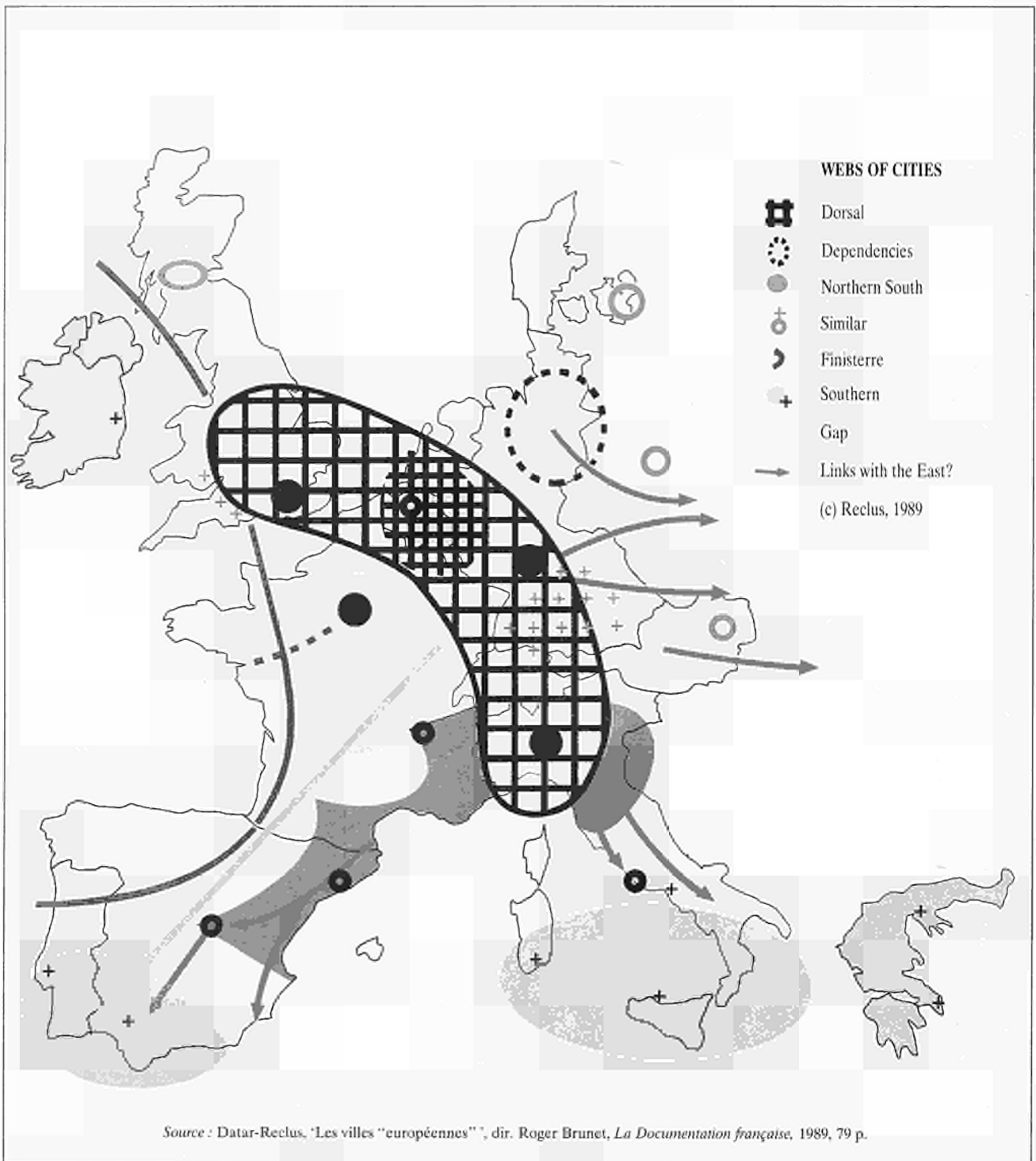
The following pages attempt to illustrate some of the processes taking place in certain European cities, such as:

(i)   general organization of the urban network,

(ii) population distribution in the urban area,

(iii) geographical distribution of jobs,

(iv) functional changes,

(v)   the evolution of residential areas.

1. GENERAL ORGANIZATION OF THE URBAN NETWORK IN EUROPE

In 1989 the Reclus public interest group and the *Délégation à l'aménagement du territoire et à l'action régionale* published the results of their work on the web of 'European' cities (p. 86). In the 12 European Community countries (plus Switzerland and Austria) there are 165 cities of over 200 000 inhabitants. By combining various criteria (population, public services and activities), it is possible to define the present network of European cities. This network forms several sub-units which are clearly visible on the map:

(1) A *megalopolis* extending from England to Lombardy.

(2) A sub-system known as the *Northern South* spreading from Geneva-Lyon and Veneto, Emilia Romagna and Tuscany towards Barcelona, Madrid and Valencia, and embracing the French Mediterranean 'Boulevard' (note that other cities in the north have similar characteristics to these sub-systems, like Glasgow, Edinburgh, Groningen, Copenhagen, Berlin and Vienna).

**WEBS OF CITIES**

Dorsal

Dependencies

Northern South

Similar

Finisterre

Southern

Gap

Links with the East?

(c) Reclus, 1989

Source : Datar-Reclus, 'Les villes "européennes"', dir. Roger Brunet, *La Documentation française,* 1989, 79 p.

(3) A subsystem comprising the *Atlantic coast* cities.

(4) The *outlying cities* subsystem.

European development, i.e. the completion of the single market, is taking place in a spatial context which has constraints and potentials of historical origin. This spatial environment requires policies appropriate to it. The Datar-Reclus study ends by saying that the megalopolis still has a solid foundation. The Northern South is not lacking in potential, while the Atlantic coast faces an uphill struggle. A lot also depends on how central Europe, which we still call the East, forges links with the West (p. 78).

2. POPULATION DISTRIBUTION IN THE URBAN AREA

2.1. Density

The population density in Brussels illustrates what is happening in the urban centres where services are growing: depopulation of the centre, high proportion of immigrant workers, and a constant reduction of population density in outlying areas.
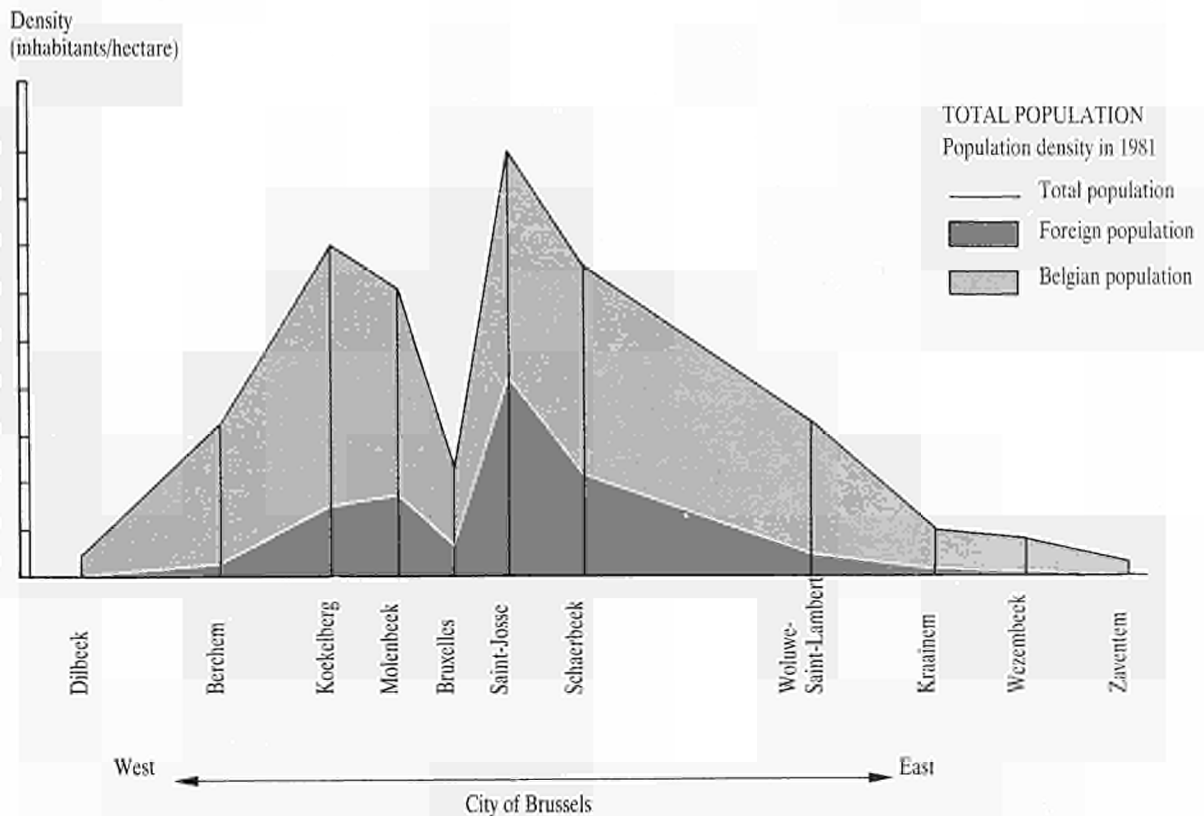
Source : Secrétariat d'État à la Région bruxelloise, « Éléments de dynamique urbaine dans la Région bruxelloise », vol. 1, *L'évolution de la population de 1947 à 1981*, tome 1, *Les composants de l'évolution démographique*, Sobemap — Brussels.

2.2. Structure and composition of the population in urban areas

In 1983 the Council of Europe published two reports on urban population under this title. The first, on southern Europe, was written by Mr A. Colini and Mr G. Gesano; the second concerned northern and central Europe and was written by Mr P. Drewe. [1].

The data given here are an update of those drawn up in 1983 and are based as far as possible on the same definitions.

ATHENS

	1951	1961	1971	1981
City	555 484	627 564	867 023	885 737
'Greater Athens'	1 378 586	1 852 709	2 540 241	3 027 331

COLOGNE

	1951	1961	1971
Centre	157 151	135 090	132 717
City	994 705[1]	976 534	937 482
Metropolitan area	1 715 611[1]	1 775 768	1 753 179

[1] Cologne excluding Wesseling.

BARCELONA

	1955	1965	1975	1986
Centre	—	207 909	125 047	101 204
City	—	1 557 863	1 751 136	1 714 335
Metropolitan area	1 533 339	1 999 376	2 977 578	2 990 368

LISBON

	1950	1960	1970	1988
Centre	251 399	207 909	125 047	146 619
City	777 310	801 653	1 789 041	—
Metropolitan area	1 308 305	1 525 087	1 843 223	—

BOLOGNA

	1951	1961	1971	1979	1989
Centre	113 671	93 483	80 168	69 720	58 918
City	340 526	444 872	490 528	471 454	454 703
Metropolitan area	452 573	562 370	655 101	662 263	589 415

LONDON

	1971	1979	1987
Central London	3 016 500	2 671 900	2 323 900
Metropolitan area	7 441 600	6 877 100	6 770 400

SOME CHARACTERISTIC FEATURES OF THE EVOLUTION OF CERTAIN EUROPEAN CITIES

MADRID

	1951	1961	1971
Centre	231 408	195 931	146 495
City	3 120 941	3 367 438	3 058 182
Metropolitan area	3 441 343	4 089 660	3 964 571

ROME

	1961	1971	1979	1982
Centre	238 774	165 377	157 567	161 668
City	2 188 160	2 781 993	2 911 671	2 834 094
Metropolitan area	2 452 661	3 178 609	3 457 957	3 371 006

MANCHESTER/SALFORD

	1971	1979	1987
Cities	823 840	745 300	687 800
Greater Manchester	2 729 040	2 663 500	2 580 100

ROTTERDAM

	1971	1979	1989
City	679 032	582 396	576 218
Rijnmond	1 033 983	1 033 943	1 076 824

MARSEILLE

	1954	1962	1975	1982
Centre	57 603	55 346	45 930	44 712
City	663 175	774 034	904 993	1 110 511
Metropolitan area	—	—	1 067 305	1 229 241

STRASBOURG

	1968	1975	1982
Centre	107 535	95 950	90 656
City	251 027	257 273	252 264
Metropolitan area	368 348	396 212	408 982

PARIS

	1968	1975	1982
City	2 590 800	2 299 800	2 156 243
Ile de France	9 248 600	9 878 500	10 074 000

TURIN

|	1979	1982
Centre (a)	113 135	96 675 (b)
City	1 160 686	1 093 384
Metropolitan area	1 881 148	1 781 171

(a) Centro + Crocetta.
(b) 1986 figures.

1 Council of Europe, *Structure and composition of the population in urban areas*, 1. *Southern Europe*, 2. *Northern and central Europe* (population studies Nos 6 and 7) — Strasbourg 1983.

3. GEOGRAPHICAL DISTRIBUTION OF JOBS IN CITIES
(ESPECIALLY IN THE SERVICE SECTOR)

The concentration of service sector activities in urban centres can be observed in many European cities. In this case the old centres lose their inhabitants. Brussels illustrates this point very clearly. Large numbers of offices, and hence high concentrations of jobs, can also be found, however, in outlying areas (such as La Défense in Paris).

EAST-WEST SECTION THROUGH THE CENTRE OF BRUSSELS,
SHOWING THE GEOGRAPHICAL DISTRIBUTION OF JOB AND POPULATION DENSITIES IN 1981
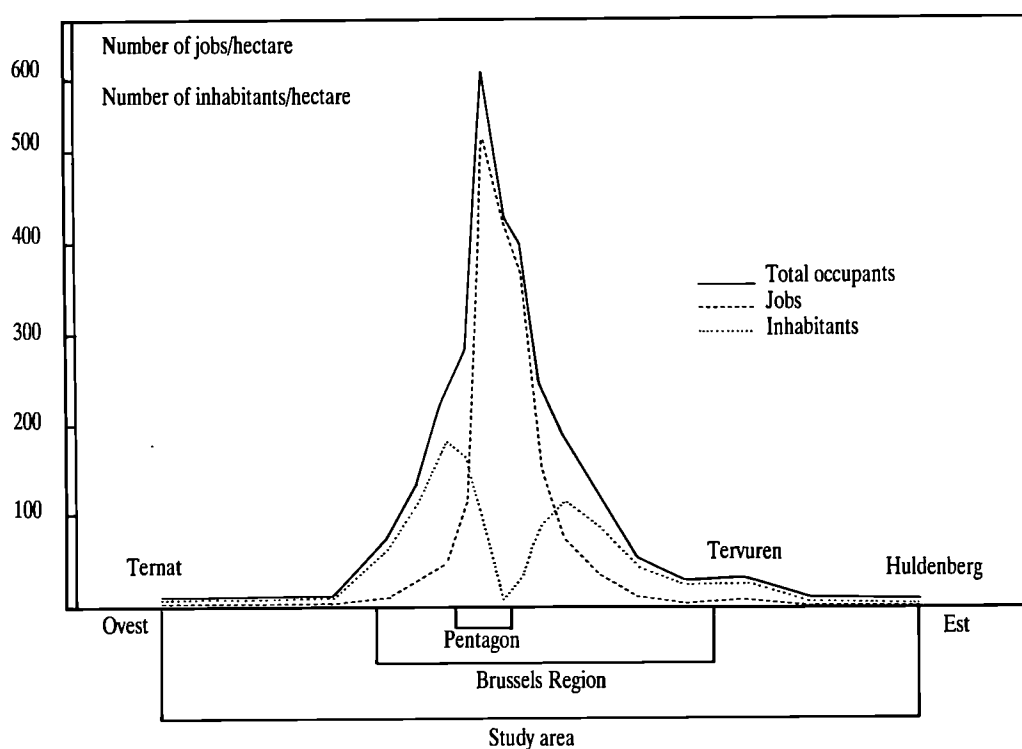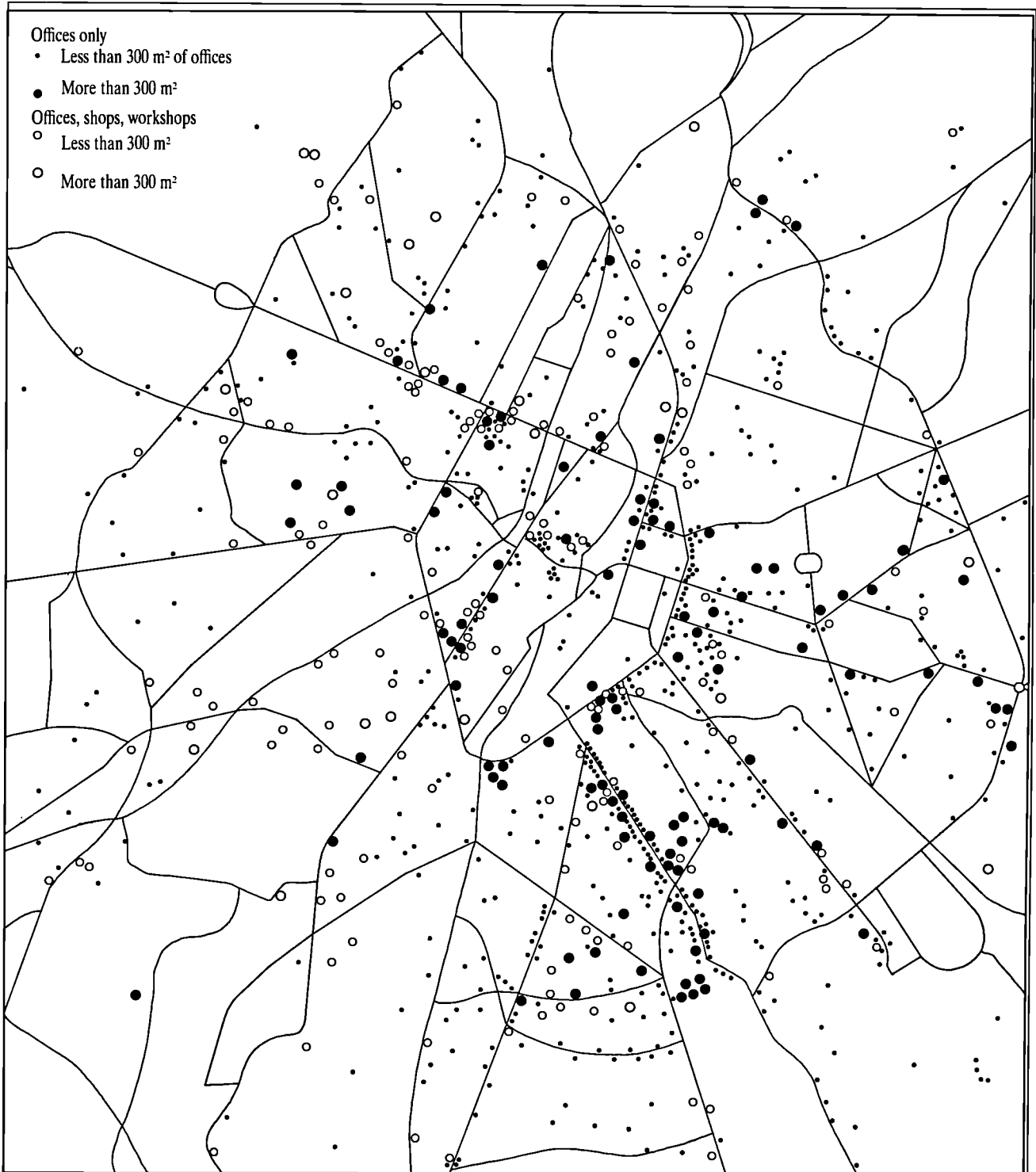

Source : Stratec — *Transport demand in Brussels,* 1989, p. 10.

4. FUNCTIONAL CHANGES IN CITIES

Since the early 1950s Brussels has seen gradual functional changes: part of its industry has disappeared and housing has been converted into offices. The old housing has then been demolished and replaced by purpose-built premises.

Offices only
• Less than 300 m² of offices
● More than 300 m²

Offices, shops, workshops
○ Less than 300 m²
○ More than 300 m²

OFFERS OF OFFICE SPACE IN BUILDINGS DESIGNED FOR OTHER FUNCTIONS

Based on advertisements in *Le Soir* and *Vlan* between January 1985 and July 1987.

Source: Ministry of the Brussels Region — *Location of offices in the Brussels Region*, Bureau A.M. Vanden Bossche, 1988, p. 45.

5. THE EVOLUTION OF RESIDENTIAL AREAS INTO OFFICES

Most areas now dominated by offices were formerly residential areas.

DISTRICTS

Axes

Density

Means

Sessions
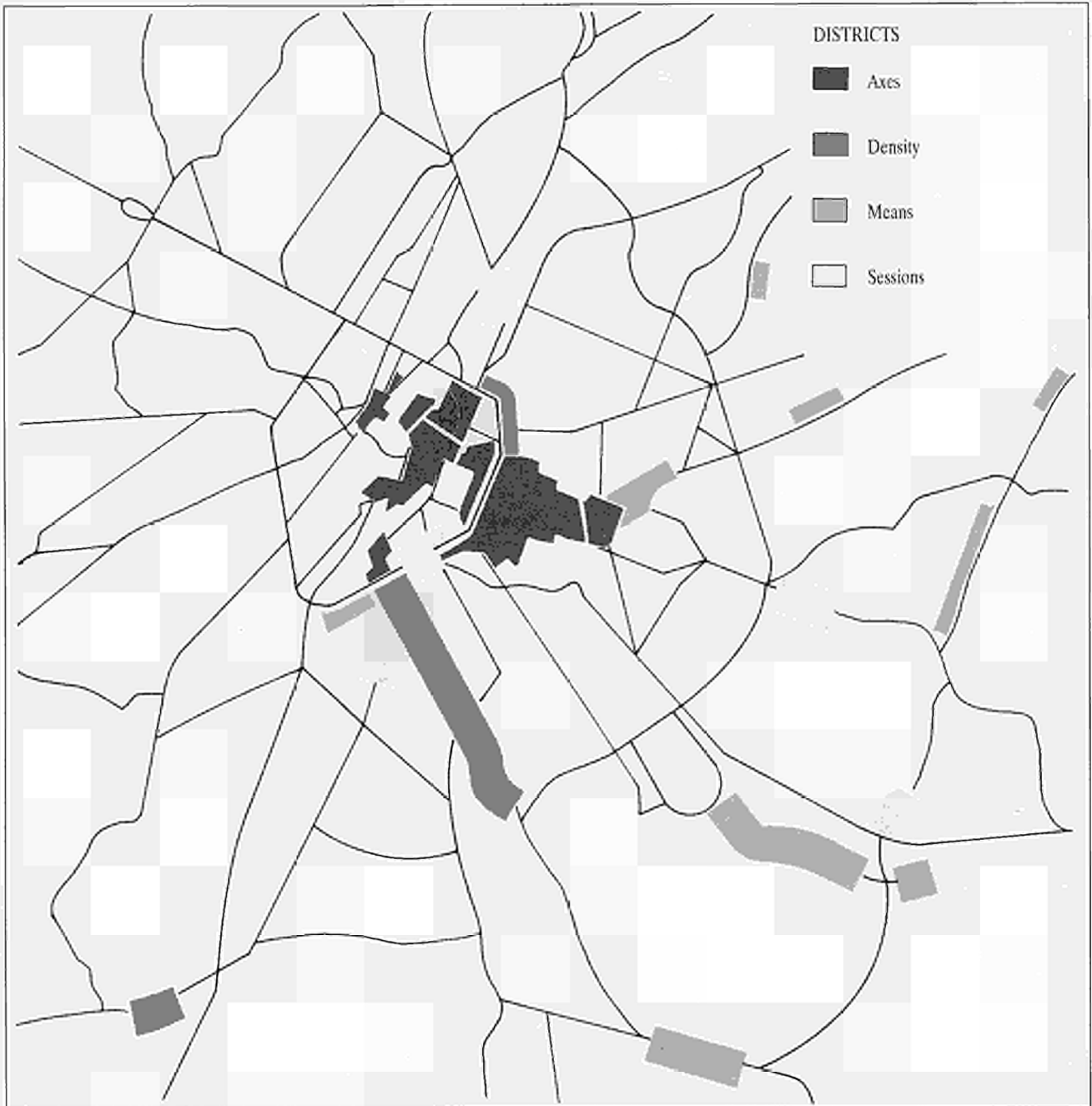
Source: Ministry of the Brussels Region, Ibid. p. 45.