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## Urban morphology as an emerging interdisciplinary field

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**Abstract.** *The forces and events leading to the formation of the International Seminar on Urban Form (ISUF) are identified. ISUF is expanding the field of urban morphology beyond its original confines in geography, particularly into the domains of architecture and planning. Three schools of urban morphology, in England, Italy and France, are coming together, following seminal work by two morphologists, M.R.G. Conzen and Saverio Muratori. The bringing together of these schools provides the basis for an interdisciplinary field and the opportunity to establish common theoretical foundations for the growing number of urban morphologists in many parts of the world. ISUF's ambitious mission is to address real and timely issues concerning city building by providing a forum for thought and action which includes related disciplines and professions in different cultures. The potential of an interdisciplinary urban morphology to contribute to the understanding and management of urban development in a period of unprecedented change is discussed.*

*Key Words:* urban morphology, interdisciplinarity, city building, geography, architecture

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Urban morphology is the study of the city as human habitat. Ethnographer Lévi-Strauss (1954, pp. 137-8) described the city as 'the most complex of human inventions, ... at the confluence of nature and artifact'. Urban morphologists concur: they analyse a city's evolution from its formative years to its subsequent transformations, identifying and dissecting its various components. The city is the accumulation and the integration of many individual and small group actions, themselves governed by cultural traditions and shaped by social and economic forces over time. Urban morphologists focus on the tangible results of social and economic forces: they study the outcomes of ideas and intentions as they take shape on the ground

and mould our cities. Buildings, gardens, streets, parks, and monuments, are among the main elements of morphological analysis. These elements, however, are considered as organisms which are constantly used and hence transformed through time. They also exist in a state of tight and dynamic interrelationship: built structures shaping and being shaped by the open spaces around them, public streets serving and being used by private land owners along them. The dynamic state of the city, and the pervasive relationship between its elements, have led many urban morphologists to prefer the term 'urban morphogenesis' to describe their field of study.

In the summer of 1996, a group of urban

morphologists from a variety of disciplines including architecture, geography, history and planning, formalized the International Seminar on Urban Form (ISUF - or *SIFU*, *Séminaire International de la Forme Urbaine*, *Seminario Internazionale de la Forma Urbana*). The group, which included individuals from England, France, Germany, Ireland, Switzerland, Japan, Australia, and the USA, had also met in the previous two summers at the same venue, Lausanne, Switzerland, to explain and compare their work. These meetings acknowledged the expansion of urban morphology beyond its original confines in geography, and its emergence as an interdisciplinary field. They highlighted the need to promote international exchanges and to investigate the scope of the field's theoretical basis.

### Three schools of urban morphology

The ISUF meetings confirmed that several generations of scholars had been active in urban morphology, not only in England, but also in Italy and in France, and that many individual researchers from a variety of other countries were contributing to the field. Two individuals figure prominently as seminal instigators of the field: M.R.G. Conzen (b. 1907), a German geographer who migrated to England before the Second World War, first to study and practice urban planning, and then to teach geography; and Saverio Muratori (1910-73), an Italian architect who taught in Venice and then in Rome. Both men were unusual and non-conforming in their respective realms of geography and architecture. Conzen, who is best known for his detailed study of Alnwick (1960), had to weather the post-war quantitative revolution in geography, which largely passed over his inductive and empirical research as lacking in rigour and predictive power. Muratori, on the other hand, who used his self-termed 'operational histories' of Venice and Rome (Muratori, 1959, 1963) as the theoretical basis for his architectural design studios, suffered intellectual isolation (and scorn) from his modernist colleagues in architecture.

However, the strengths of Conzen's and Muratori's teachings attracted followers who saw the importance of capturing what the masters had called the city's 'genius loci', and its unique mnemonic powers as cultural palimpsest. J.W.R. Whitehand (1981) ensured Conzen's legacy by compiling some of his works and investigating the development and significance of his ideas. An urban and historical geographer, Whitehand pushed the limits of urban morphology into urban economics, researching the relationship between the city, its habitats, and the dynamics of the building industry. In 1974, he formed the Urban Morphology Research Group at the University of Birmingham, which includes research on medieval cities, notably that conducted by T.R. Slater, as well studies of twentieth-century suburban expansion and transformations. A sustained programme of conferences and publications over the past 25 years has made the Urban Morphology Research Group an unusually strong centre of research, complementing mainstream traditions in urban geography. A steady flow of distinguished Ph.D. graduates from Birmingham, such as Peter Larkham, Karl Kropf and Keith Lilley, has also helped to spread the group's influence.

In Italy, Gianfranco Caniggia (1933-87) took over the mantle of Muratori who had supervised his 1963 study of the city of Como. In his teachings and publications, Caniggia continued the Muratorian tradition, which he called 'procedural typology' because of the focus on building types as the elemental root of urban form. Like Muratori, Caniggia put his theory into practice, remaining actively involved in architecture and building throughout his life. His research extended to several cities in Italy and North Africa, conducted with colleagues and students who continue the Muratorian legacy. Today, Giancarlo Cataldi, Gian Luigi Maffei, Maria Grazia Corsini, Paolo Maretto, Giuseppe Strappa, and others, continue the tradition in Florence, Rome, Genoa, and Siena.

After Conzen and Muratori had seeded the

ground for the two early schools of urban morphology, a third school emerged in France in the late 1960s, when architects Philippe Panerai and Jean Castex, together with sociologist Jean-Charles DePaule, founded the School of Architecture in Versailles as part of the dissolution of the Beaux-Arts. Like the Italian School, the French School rose out of a reaction against modernist architecture and its rejection of history. However, it also benefited at the time from the vibrant intellectual discourse on urban life which surpassed architecture and engaged such powerful critics as sociologist Henri Lefebvre and architectural historians Françoise Boudon and André Chastel. While already busy with research on the historical evolution of Parisian neighbourhoods, Panerai and Castex literally stumbled into Muratori's works, then unknown in France, which provided the impetus for further probing the theoretical and methodological dimensions of their work. Over the years, they established contacts with researchers not only in Italy, but also in Spain and Latin America. The products of these exchanges remain to be documented. On the other hand, Castex and Panerai's early publications exerted considerable influence throughout the European architectural community. Subsequent detailed studies of the city of Versailles, the French bastides, and the city of Cairo, Egypt, helped to prepare a second generation of morphologists in France. Over this past decade, research groups have been founded in Nantes, by Michaël Darin, and in Marseilles, by Jean-Lucien Bonillo.

### ISUF: a genealogy

Until the first ISUF meeting in 1994, there had been some proselytizing, but few formal linkages and exchanges between the three main schools of urban morphology - Conzenian, Muratorian, and Versailles.<sup>1</sup> The creation of ISUF was brought about by many personal contacts and individual circumstances, as well as by the fortuitous merging of two separate quests for

international outreach: the systematic dissemination of publications on the part of English-speaking geographers, and the growing popularity of Italian architecture world-wide.

The Conzenian group maintained a consistent profile in British and American geographical circles, benefiting internationally from the active participation of Conzen's son, M.P. Conzen, a geographer at the University of Chicago, from continued contacts with James Vance Jr at the University of California, Berkeley, and with Deryck Holdsworth, now at Pennsylvania State University. The Birmingham group had also established links with researchers in Ireland, Germany, Poland, Spain and Austria. The *Stadtlandschaft* tradition that had been strong in central European geography in the inter-war years, including in the University of Berlin where Conzen had been a student, continued to have its adherents, but by the 1980s, their numbers had dwindled, leaving comparatively few scholars, such as Elisabeth Lichtenberger and Dietrich Denecke, active in the field.<sup>2</sup>

The Birmingham group also developed ties with the British planning profession, mainly in the area of urban conservation, an interest directly related to Conzen's ideas on townscape management. In contrast, contacts with architects emerged slowly and solidified, ironically, as British architects became familiar with the Muratorian School in the mid 1980s.

The diffusion of Muratorian ideas followed the general rise in the popularity of Italian architecture throughout the world, particularly with the translation into English of Aldo Rossi's works in the 1980s.<sup>3</sup> Although Rossi chose to remain silent about Muratori's considerable influence on his early professional development, he successfully promoted a return to 'traditional' building types, thus kindling a renewed interest in the historic city and promoting its significance in architecture. British, American, and French architects all listened to Rossi's message. They also read another Italian architect, Carlo Aymonino, whose study of Padua and other

writings on what he termed 'typo-morphology' stimulated further interest in the design of the city. Incidentally, but significantly for the structure of ISUF, both Rossi and Aymonino subsequently rejected urban morphology, which they saw as promoting outdated solutions to today's urban problems and impotent in resolving issues of modern architecture.

In retrospect, however, the Italian contribution that was most instrumental in linking the three main schools of urban morphology, and hence in shaping ISUF, was the rehabilitation programme of Bologna's historic centre - for which Caniggia was a consultant. The rapid diffusion of this project, its rich scope and successful implementation, helped to forge contacts between morphologists in several parts of the world.

This was the context in which Caniggia was invited to visit Oxford Polytechnic by architect and Italiophile Ivor Samuels in the early 1980s. Though Caniggia did not meet the Birmingham geographers at the time, Samuels had by then begun to collaborate with his compatriots. In the last years of his life, Caniggia undertook an extensive outreach programme of his own. He spent three months at the University of Washington, Seattle, in 1986, after meeting me and one of my colleagues a year earlier in Naples, Italy, at a seminar honouring Kevin Lynch's work. He also visited the Federal Polytechnic Institute of Zurich, Switzerland, to present his and Maffei's work on Florence which was edited and translated by Sylvain Malfroy.

As mentioned earlier, the Versailles School maintained contacts throughout the Latin and Arab worlds. By the end of the 1970s, their work had been translated into several European languages and was being circulated in the United States for possible publication in English - this attempt failed and, to this date, the French work is not accessible to an English-speaking audience. International outreach by the French on urban morphology was first formalized in 1986 by the prestigious *Institut d'Urbanisme* of the

University of Paris. The *Institut* organized a symposium on urban morphology to address the issue of the failures of modernism in new town design. The list of invitees included many well-known scholars, urban designers, and architects from Europe and North America. Yet neither the members of the Versailles School, nor any of the close collaborators of the Birmingham and the Muratorian schools participated in the symposium, with the exception of Ivor Samuels, from Oxford Polytechnic, and Albert Levy, then teaching in Geneva, Switzerland. Shortly after the symposium, however, links were forged across the Parisian region between the Versailles School and the *Institut d'Urbanisme*, and both Castex and Panerai now teach regularly at the *Institut*. Closer working relationships have now developed with the new generation of French urban geographers.

Castex, who had spent time in New York in the late 1960s, further helped to develop ties with North America by returning in 1988 as a Visiting Professor at the University of Oregon. He also lectured on that occasion at the University of Washington in Seattle. I had met Castex and visited Versailles a year earlier, although I had known of his and Panerai's work for a decade, and had shared thoughts about morphology with such Francophiles as M. Christine Boyer and the urban landscape scholar Paul Groth, a student of James Vance. Also in 1987, I was scheduled to lecture in Rome as part of an attempt to 'close the loop' between the Italian and French schools of urban morphology. Caniggia's sudden death was impetus for establishing relationships with his colleagues in Florence, Rome, and Genoa.

Further outreach in the English-speaking world was facilitated by the Birmingham group's publication of the *Urban Morphology Newsletter* from 1987 onward. In 1990, the group hosted an international conference and edited a book whose contributors included several North Americans and 'continental' Europeans. Finally, individual contacts have developed since the late 1980s between North American, Asian, and Australian researchers.

The genealogy of ISUF is expectedly complex. However, given the natural rift between geography and architecture, their different intentions and missions, the usual local turf battles and, importantly, the cultural and linguistic divide between Anglo-Saxons and Latins, it is a happy surprise to see ISUF in existence only four decades after Muratori's *Storia Operante di Venezia* and Conzen's *Alnwick*. Interestingly, geographical centrality and neutrality, not chance, called for the first three meetings of ISUF to take place in Switzerland. Swiss academics and researchers had naturally developed ties with both the Italian and the French schools of morphology. Léopold Veuve, Bruno Marchand and Sylvain Malfroy offered to host meetings on three consecutive years at the Federal Polytechnic School of Lausanne, which culminated in the confirmation of ISUF as an organization, the announcement of a first open conference in Birmingham in 1997, and the creation of this journal.

The first ISUF encounters in Lausanne increased the intensity of exchanges between the schools. Specifically, Attilio Petruccioli, who studied under the Muratorian School in Italy, has organized annual conferences in Cambridge, Massachusetts, since 1995 under the auspices of the MIT Aga Khan Program, which have included many of the members of the ISUF community. As a result, a new generation of urban morphologists is quickly emerging and producing needed comparative work on the three schools.

### The theoretical basis

This coming together of researchers from different language areas and disciplines is founded on common ground. First, there is agreement that the city or town can be 'read' and analysed via the medium of its physical form. Further, there is widespread acknowledgment that, at its most elemental level, morphological analysis is based on three principles.

1. Urban form is defined by three fundamental physical elements: buildings

and their related open spaces, plots or lots, and streets.

2. Urban form can be understood at different levels of resolution. Commonly, four are recognized, corresponding to the building/lot, the street/block, the city, and the region.

3. Urban form can only be understood historically since the elements of which it is comprised undergo continuous transformation and replacement.

Thus *form*, *resolution*, and *time* constitute the three fundamental components of urban morphological research. These are present in all studies, whether by geographers or architects, and whether they focus on a medieval, baroque, or contemporary city. The smallest cell of the city is recognized as the combination of two elements: the individual parcel of land, together with its building or buildings and open spaces. The characteristics of the cell define the urban form's shape and density, as well as its actual and potential use over time. Studies show that the attributes of the cell and its elements reflect not only a time period of history, but the socio-economic conditions present at the time of land development and building. Over time, these elements are either used differently - for example, by different social classes - transformed physically, eliminated or replaced by new forms. The rate of change in either the function or the form of the cells varies from city to city, but also generally fits into cycles related to the economy and culture. Building and transformation cycles are important processes to explore for city planning and real estate development purposes, yet are rarely studied in contemporary cities.

Studies also focus on what Conzen calls the 'plan unit' and what Italians term *tessuto*. Plan units or 'tissues' are groups of buildings, open spaces, lots, and streets, which form a cohesive whole either because they were all built at the same time or within the same constraints, or because they underwent a common process of transformation.

Furthermore, while all morphological

analysis is carried out for the purposes of theory building, several distinct purposes exist among urban morphological traditions which yield different kinds of theories. The three schools each have had different intentions in their theory building efforts. They are: as follows.

1. The study of urban form for *descriptive* and *explanatory* purposes, with the aim of developing a *theory of city building* (*théorie de l'édification de la ville*). Such studies are concerned with how cities are built and why. This is the primary purpose of geographers, and the Birmingham School in particular. Social scientists in the French School also have this purpose in mind when they carry out morphological studies.
2. The study of urban form for *prescriptive* purposes, with the aim of developing a *theory of city design*. Such studies concentrate on how cities should be built. This is the primary focus of the Italian School which has given this purpose a special direction, namely to develop a theory of building design resting on historical city-building traditions. A few French researchers have had the same intentions in their morphological analyses, seeing the purposes of their work as being to develop a *théorie du projet basée sur les traditions d'édification de la ville*.
3. The study of urban form to assess the *impact of past design theories on city building*. This is in the realm of design criticism, which makes the sophisticated distinction between the *theory of design 'as idea'*, and the *theory of design 'as practised'*. Such studies assess the differences or similarities between stated directives about what should be built (normative theories) and what has actually been built. The French School has championed this use of morphological analysis, tracing successfully the roots of modernism in urban design back to the eighteenth century. However, it remains a difficult mental exercise for many designers and planners, who tend not to

spend time assessing the impact of their actions on the long-range life of cities.

### Issues and potential

As is frequently the case when something new is being proposed, the strengths of the innovation are also its weaknesses. The founding of an interdisciplinary field of urban morphology creates both tensions and opportunities which ISUF will have to face. Let us discuss first some of the general issues related to the field, and then some of the specific questions about the state of the field today.

ISUF's mission is ambitious, and hence laden with potential conflicts with existing structures in the worlds of research and practice. ISUF has established a domain which spans geography, history, archaeology, architecture and planning, hence the humanities, social sciences and professions, study and action, knowledge and decision, description and prescription. This domain is currently a large mosaic of intellectual turfs, all slowly adjusting their boundaries in the usual tug-of-war about power and ideas, and all represented by numerous magazines, journals, books, organizations with their associated conferences, web pages, etc. On the positive side, ISUF creates a domain which pulls together pieces of all these turfs to focus on a real phenomenon: James Vance calls this real phenomenon *city building*, to include the physical forms and all of the processes related to the act of making cities. This means that urban morphology can turn its back to whatever internal power struggles are taking place within geography and transcend the adolescent strifes plaguing city planning, architecture, real estate, and construction. It also means that urban morphology promises to bridge a gap which is currently debilitating both the research and the practice of city building. Hence ISUF is an opportunity to provide a forum for thought and action about how we shape and manage our habitats - a timely subject indeed at this point in the history of civilization. Yet, however exciting the opportunity and

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however noble the goal, ISUF's future path is likely to be arduous for a number of reasons.

First, unlike engineering and medicine, for example, architecture and planning have, singly or together, yet to develop a shared knowledge base. These are professions that thrive on action and projecting possible futures, but which leave little room for research and evaluation. They have not followed other professions in developing a systematic, empirical approach to learning and building a knowledge base. They have few, if any, mechanisms to relate study and action. Whatever the reasons are for what amounts to an artistic approach to decision making in architecture and planning, this state of affairs means that urban morphologists will be tracking uncharted territories with these professions. They will have to catch their attention, to demonstrate the validity and effectiveness of the morphological approach in identifying cause and effect relationships.

From the perspective of the social sciences, doubts about the theory building powers of urban morphology come from two opposite sides. On the one hand, positivists question the empirical and inductive way of researching the city and point to the weak predictive powers of a theory of city building. However, the predictive powers of positivist research have been under criticism themselves because the reductionistic nature of this approach has not been effective in addressing human behaviour issues. On the other hand, artistic and literary groups distrust the single focus of urban morphology on the physical reality of the city. Yet criticism related to what can be interpreted as the physical determinism of urban morphology can also be silenced: urban morphology approaches the city not as artifact, but as organism, where the physical world is inseparable from the processes of change to which it is subjected. The focus is on the physical world as the *result* of dynamic social and economic forces. ISUF's challenge is to demonstrate the common ways in which cities are built and transformed, to define and illustrate the

principles of change in many different contexts - for example, how street blocks are modified, depending on how they were laid out in the first place, and depending on the type and intensity of development around them; or, how different conditions will define whether a given area is subjected to infill development or to complete redevelopment.

Secondly, the research material that ISUF brings to this now larger world has its own frailties. Most urban morphological research has focused on historic European cities, a double limitation which may seem to hinder practical applications in today's world. There is a need for research to address the unprecedented expansion of cities over the course of this century, and a need to direct this research at cities that have grown in non-European cultures. Significantly, however, a number of recent studies of twentieth-century cities in Europe, North America, and Australia, as well as a growing number on Asian cities, confirm the validity of the city-building principles identified earlier by the three schools: the basic elements of urban form are the same, and formative and transformative processes share the same basis. This is the exciting, and wide-open, part of urban morphology: its potential to help face the city-building boom of the next few decades in areas other than North America and Europe.

Important in relation to this and other tasks is the fact that the revolution currently taking place in the way city-building activities can be recorded holds great promise for morphological analysis. Geographical Information Systems (GIS) can now not only record the spatial characteristics of habitats, but also link spatial attributes to quantitative data so that, for the first time, physical space can be measured and analysed in relation to the socio-economic forces that shape it - for example, census data can now be linked fairly easily to actual building forms and land uses. Also, many jurisdictions store their records at the level of the individual parcel of land, thus allowing urban analysis at the very scale at which urban morphologists excel. As a result, these new, 'intelligent' maps

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enable regional analyses to be carried out with detailed data available at the parcel level, or, conversely, parcel-level analyses can be applied to an entire region. This has tremendous implications for both the research and the management of urbanized areas. Significantly, parcel-based GIS offer the empirical data that urban morphologists need (and have so far painstakingly acquired by hand). Collected longitudinally, such empirical data open up immense research opportunities to both monitor and explain the transformation of urban forms. Further, parcel-based GIS combine data that serve the real estate and construction industries as well urban planners and policy makers. They offer the ability to co-ordinate the activities of these traditionally separate fields. Finally, and perhaps most importantly, these spatially coded data bases allow morphologists to study for the first time very large areas of urban or suburban development. For the first time, then, urban morphological analysis has the tools to address the characteristics of contemporary metropolitan areas.

Expectations must necessarily be guarded - technology having proved to be an excellent servant, but a poor master. However, current advances in parcel-based GIS can help to move the centre of urban morphological research from its foundation in the study of small historic towns to today's large urbanized regions, and from applications in urban conservation to the management of future urban development. Certainly, the opportunities for theory construction that ISUF offers can make such a future tangible.

### Notes

1. For a list of references on the work of the three schools, see Moudon, A.V. (1994) 'Getting to know the built landscape: typomorphology', in Franck, K. A. and

- Schneekloth, L. (eds) *Ordering space: types in architecture and design* (Van Nostrand Reinhold, New York) 289-311.
2. For discussions of, and references to, the role of urban morphology in geography, see Conzen, M.P. (1978) 'Analytical approaches to the urban landscape', in Butzer, K.W. (ed.) *Dimensions of human geography* University of Chicago Department of Geography Research Paper 186, 128-65; Whitehand, J.W.R. (ed.) (1981) *The urban landscape: historical development and management* Institute of British Geographers Special Publication 13 (Academic Press, New York); Whitehand, J.W.R. (1988) 'Recent developments in urban morphology', in Denecke, D. and Shaw, G. (eds) *Urban historical geography: recent progress in Britain and Germany* (Cambridge University Press, Cambridge) 285-96; Slater, T.R. (ed.) (1990) *The built form of Western cities* (Leicester University Press, Leicester).
3. For discussions of, and references to, the role of urban morphology in urban design and architecture, see Panerai, Ph., Depaule, J.Ch., Demorgon, M. and Veyrenche, M. (1980) *Éléments d'analyse urbaine* (Editions Archives d'Architecture Moderne, Brussels); Moudon, A.V. (1992) 'A catholic approach to organizing what urban designers should know', *Journal of Planning Literature* 6, 331-49.

### References

- Conzen, M.R.G. (1960) *Alnwick, Northumberland: a study in town-plan analysis* Institute of British Geographers Publication 27 (George Philip, London).
- Lévi-Strauss, C. (1955) *Tristes Tropiques* (Terre Humaine, Paris).
- Muratori, S. (1959) *Studi per una operante storia urbana di Venezia* (Istituto Poligrafico dello Stato, Roma).
- Muratori, S., Bollati, R., Bollati, S. and Marinucci, G. (1963) *Studi per una operante storia urbana di Roma* (Consiglio nazionale delle ricerche, Roma).