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The study of urban form in Canada

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Abstract. *This paper examines contributions to the study of urban form in Canada by French and English researchers working in a variety of disciplines, especially architecture, planning, geography, and history. Instead of discussing contributions purely along traditional linguistic or disciplinary lines, the authors use a novel classification scheme to identify and categorize significant works according to their particular epistemological perspective, before describing noteworthy contributions of various academic disciplines by key authors and research themes. The most significant contributions to the study of urban form in Canada have come from two largely isolated camps: first, architects/planners, mostly from Québec, who examine form as a relatively independent system and work in the tradition of the so-called 'Italian school' of process typology; and secondly, predominantly anglophone urban and historical geographers who deal with built forms and urban morphogenesis as a product of external forces. Recent work suggests that the 'two solitudes' may be coming together.*

Key Words: urban morphology, geography, architecture, planning, Canada

Significant studies of urban form in Canada have been produced by researchers from a variety of disciplines, particularly architecture, planning, geography and history. While the majority of urban morphological research has been published in English, many noteworthy works have been produced in French only. In this paper we attempt to elucidate the key Canadian contributions to urban morphology from all sources. Given the incredible diversity of existing works, we have taken on a seemingly impossible challenge, particularly in the scope of such a short article. Nevertheless, using the classification scheme

proposed by Gauthier and Gilliland (2006) (see this issue, pp. 41-50) we are able to categorize effectively and discuss many of the most significant morphological contributions according to their common epistemological perspectives, rather than being constrained by any disciplinary or linguistic straightjacket. This exercise not only allows us to identify the underlying similarities among the seemingly disparate Canadian contributions, but it also offers readers the opportunity to view these contributions in the context of work from other countries and to reflect on potential transnational legacies in urban morphology (cf.

Gauthier and Gilliland 2006, Fig. 1).

In this review, we first sort significant contributions according to the epistemic status conferred to urban form: by distinguishing between *internalist* studies that consider the urban form as a relatively independent system, and *externalist* studies in which urban form stands as a passive product of various external determinants. Within each of these two fundamental categories we also consider the key works according to heuristic purpose: *cognitive* studies are those primarily aimed at providing explanations and/or developing explanatory frameworks for understanding urban form, whereas *normative* studies serve to prescribe the modalities according to which the city should be planned or built in the future (Figure 1). For a full description of the classification scheme, see Gauthier and Gilliland (2006).

Internalist approaches

It may be surprising to most readers of *Urban Morphology* to learn that the 'Italian process typology' approach to understanding the built environment has been part of the curriculum in architecture schools in Québec since the 1980s. Furthermore, internalist morphological approaches more generally have been taught for over four decades. The following section discusses the particular contributions of the earliest proponents of internalist approaches; although they have not published widely, these scholars have been very influential through their teaching of successive generations of morphologists. A third generation of morphologists is now publishing novel studies from both *internalist-cognitive* and *internalist-normative* perspectives, and is contributing to the reform of planning, urban design and heritage preservation practices across the country.

Internalist-cognitive studies: architects and the Université Laval connection

Beginning in the mid-1960s, a small but

influential group of architecture professors in Québec developed a keen interest in architectural and urban morphology. Most of these professors were graduate students of Alfred Neumann (1900-1968), a respected modern architect from Vienna who studied with Peter Behrens. Neumann was a professor of architecture at Université Laval in Québec city in 1963 and 1966-68, where he established the Master's program. In 1963, Neumann wrote two highly influential articles, 'Architecture de la morphologie' (1963a) and 'Morphologic architecture' (1963b), which capture the essence of his late-life intellectual project and approach to teaching. Neumann advocated a science of architecture that would conceive the 'whole human-made environment from a unifying point of view by applying morphological criteria' (Neumann, 1963b, p. 41). He posits that all artifacts can be roughly divided into two groups, *tools* and *containers*, the latter comprising architectural objects. Interested in the morphological properties of objects as well as in their genesis, Neumann outlined an original theory of the evolution of architectural space that characterizes it as developing from a *topological* stage, tending towards space enclosure by minimal areas and producing round figures, to a *projective geometric* stage, and finally to a *Euclidian organization* of space based on straight-lined rectangular shapes (Neumann, 1963b).

From 1968 until the turn of the century, several of Neumann's students taught at Université Laval using his morphological approach. One of them, Pierre Larochelle, developed a course for the school of visual arts (1972-1978), which dealt with the morphology of both natural objects and artifacts. After spending time in Rome familiarizing himself with the work of Muratori and his followers, Larochelle developed and taught (1987-onward) a graduate architecture seminar with Naomi Neumann (Alfred's widow) which was largely based on the Italian tradition of process typology; he introduced a similar undergraduate course in 1991. Larochelle and his colleagues conducted the first scientific research based on a typomorphological approach in Canada, including studies of the

	Cognitive	Normative	
Neumann (1963a, b)			
Després & Larochelle (1996)			
Larochelle & Dubé (1993)			Racine & Baird (2003)
Morisset (2001)	Dufaux (2000) Bourque (1991)	Latek <i>et al.</i> (1992)	
	Vachon <i>et al.</i> (2004)	Myers & Baird (1978)	Larochelle (2005)
		Larochelle & Iamandi (1999)	
Internalist approach			
Externalist approach			
	Fortin <i>et al.</i> (2002)		Bosselmann <i>et al.</i> (1995)
Gad & Holdsworth (1985, 1987a,b, 1988)		Curran & Tomalty (2003)	
Marsan (1974)	Kerr & Spelt (1965)	Fillion (2003)	Frank <i>et al.</i> (2003)
Stelter & Artibise (1982, 1984, 1986)			
Blumenfeld (1975)			
Olson (2000)	Harris (2004)	Blumenfeld (1957, 1960, 1962b)	
	Gilliland (2000, 2002, 2004)		Tyler (2000)
Bourne (1967, 1996, 2003)			
Bourne <i>et al.</i> (2003)	Evenden (1983, 1997)		

Figure 1. Mapping contributions to the study of urban form in Canada.

vernacular architecture of Québec city and Montréal (Després and Larochelle, 1996; Larochelle *et al.*, 1986), the settlement of Île d'Orléans (Larochelle and Dubé, 1993), and the historical morphology of Wendake, a native village near Québec city (Larochelle, 1999, 2002b).

The Italy-Québec connection became more explicit in the 1980s, after Larochelle produced French translations of several influential texts by Caniggia and his colleagues, including *Composizione architettonica e tipologia edilizia* (Caniggia and Maffei, 1979). Several former students of

Larochelle are now teaching architecture and planning in universities in Québec, and this third generation of typomorphologists is building a significant corpus of work on the built environment of Québec. Their work explores such themes as: urban vernacular architecture (Bourque, 1991; Dufaux, 2000; Vachon and Luka, 2002; Vallières, 1999); development practices, morphogenesis and the typological process (Gauthier, 1997, 2003); the morphogenesis of early suburbs (Vachon, 1994; Verret, 1996); early speculative housing forms (Neji, 1996); urban tissue repletive transformations (Racine, 1998); the genesis of

countryside settlements (Morency, 1994); and shopping centre morphogenesis (Moretti, 1998). An interdisciplinary group of researchers from Université Laval (GIRBa – *Groupe interdisciplinaire de recherche sur les banlieues*) has also recently developed a significant research programme focusing on the form of the automobile suburbs of Québec city created since the Second World War (Fortin *et al.*, 2002; Vachon *et al.*, 2004).

Another former student of Neumann, Pierre Morisset, introduced the morphological approach to his architecture studios at the Université de Montréal; however, as will be discussed, the typomorphological normative approach of the Italian and French traditions has had a more lasting influence on researchers at this school. While Laval's school of architecture may be the only Canadian school where there is a sizeable group of researchers committed to internalist-cognitive studies of the built environment, there are a few individuals working elsewhere from this perspective. The art historian Lucie K. Morisset (2001), for example, produced an impressive study of the morphogenesis of the old Québec suburb of Saint-Roch. On Montréal, noteworthy studies have been published on the evolution of a downtown loft district (Zacharias, 1991), the system of residential architecture (Knight and Legault, 1984), and the 'triplex', one of the city's novel and most predominant residential forms (Legault, 1989). In addition, researchers at McGill University School of Urban Planning produced a *Topographic atlas of Montréal*, which includes several chapters (internalist and externalist in approach) on the physical evolution of the city (Wolfe and Dufaux, 1992).

In 1980, Melvin Charney, both an architect and celebrated contemporary artist, wrote what would become a highly influential article on architectural urban morphology. It explores the roots of Montréal's vernacular architecture and other aspects of its urban form. Charney notes a 'return to a preoccupation with the form of the city' (Charney, 1980, p. 299). Influenced by authors such as Aldo Rossi and Giorgio Grassi (Adamczyk, 1992) as well as

by French structuralism and post-structuralism, Charney suggests that the models used to conceptualize city forms based on 'mechanical biologic analogy' might be superseded by models based on 'semiotic analogy,' hence suggesting 'a structural displacement in the understanding of architecture as a societal practice', a displacement which implies that 'there exists shared referential links to which human artifacts convey meaning' (Charney, 1980, p. 299). These theoretical assumptions would later inform a highly original and influential internalist-normative academic experiment carried on by Charney and colleagues at the Université de Montréal.

Internalist-normative studies: a morphological approach to urban design and heritage preservation

Since the late-1970s, Italian and French theories and approaches to urban form have been taught at the Université de Montréal. In 1978-9, Melvin Charney, Denys Marchand and Alan Knight introduced an architecture studio called the *Unité d'architecture urbaine* (UAU) which has exerted a lasting influence on the practice of planning and urban design in Montréal (Latek *et al.*, 1992). The UAU represents a unique academic project which has arguably developed a school of thought in its own right, a critical discourse on contemporary architecture, and an original urban design methodology (Latek, 1989; Latek *et al.*, 1992). Adamczyk describes the Unit's methodology as 'the architectural reading of the urban forms and their meaning in a culture [as] a crossing towards the appropriation of a know-how deposited in the city itself' (1992, p. 11). The act of reading is carried out by a figurative drawing technique developed by Charney which consists of superimposing various figures meant to capture 'specific formal traits; the consistencies, traces, signs, discontinuities, recurrent orders, etc. whose meanings can be related to their context and the collective memory' (Adamczyk, 1992, p. 2). *Ville métaphore projet* by Latek and colleagues (1992) is a retrospective of the

early work of the UAU (1980-90) which includes an account of the archaeology of Montréal's architectural and urban forms. The analytical method developed by the UAU is heavily based on graphic representations; this characteristic curtailed the diffusion of the work in print, beyond the one book. A recent report by the City of Montréal documents the influence of the UAU ideas and methods on the practice and history of urban design in the city (Bodson, 2001). Professors of the UAU and the *Groupe de recherche en architecture urbaine* at the Université de Montréal have received numerous commissions by the Ville de Montréal to conduct urban design studies for the revitalization of critical urban areas (Knight, 1991a, b, 1992-3, 1995).

The internalist approaches to urban morphology taught at Laval and the Université de Montréal have clearly made their way into urban planning practice in the province of Québec, as various government agencies are routinely commissioning typomorphological studies. The Ville de Montréal, for example, recently commissioned typomorphological studies to help in the preparation of its 2005 Master Plan (see Affleck and de la Riva, 2003; Consortium Atelier Braq/Atelier in Situ, 2003; Dufresne, 2003a, b; Racine and Baird, 2003). Furthermore, several boroughs in Montréal have considered typological zoning and have commissioned studies to explore potential outcomes (Dubois and Marmen, 2003; Racine and Baird, 2001, 2003). Laroche has been working on developing applied planning tools based on the knowledge of historical transformation processes (Laroche, 1997, 2001, 2002a; Laroche and Iamandi, 1999). The Ville de Québec now envisages reforming its heritage preservation policies based on such a typomorphological approach (Laroche, 2005). The provincial Ministère des Transports of Québec also recently commissioned a typomorphological study for the revitalization of the urban highways and expressways in the Québec city region (Laroche and Gauthier, 2003).

While the internalist-normative approach to urban form has been most visible in Québec, there are also a number of proponents of the

approach outside the province. In 1977, for instance, a group of students led by the architect George Baird conducted a series of typomorphological studies in Toronto to inform their final year projects. Baird and colleague Barton Myers had been influenced by the work of Aldo Rossi and other European architects, such as O.M. Ungers, R. Moneo and R. Koolhaas (Baird, 1978). More recently, the City of Toronto commissioned a typomorphological study in relation to the production of its General Plan of 1994 (Millward, 1992). In addition, Bev Sandalack of the Faculty of Environmental Design at the University of Calgary has conducted a number of significant studies from an internalist perspective in the City of Halifax, Nova Scotia and the prairie towns of Alberta (Sandalack and Nicolai, 1998; Sandalack, 2002).

Externalist approaches

The vast majority of studies dealing with urban form in Canada have adopted a common externalist perspective, even though they have come from a variety of disciplines. Furthermore, most studies have been cognitive, rather than normative in nature. The major contributions from an externalist-cognitive approach, primarily from the fields of urban geography and urban history, are considered first, beginning with a general discussion of the roots of urban form research in Canadian geography and history, and then focusing on a few significant contributions. Then secondly, although they are much fewer in number, we devote some attention to a few noteworthy works that are externalist-normative in nature, primarily from environmental scientists and planners.

Externalist-cognitive studies: urban geography and urban history

The Canadian Association of Geographers (CAG) was established in 1950. Before this time, very little work done by geographers in or on Canada was especially urban. In 1949,

Griffith Taylor, then chair of geography at the University of Toronto, wrote one of the very first English textbooks in urban geography. This pioneering text includes a description of the evolution of Toronto. However, it includes very little on urban form and takes an outdated (even for its time) environmental deterministic approach. Subsequent Canadian textbooks in urban geography devoted much more effort to considering the processes and constraints involved in 'shaping the form of a city' (Simmons and Simmons, 1969, pp. 83-102). For its time, J.N. Jackson's *The Canadian city: space, form, quality* (1973) is perhaps the most comprehensive treatment of the various elements of urban form and the processes underlying their evolution. Jackson utilizes ideas of American planners (e.g. Kevin Lynch) to explore the quality and perception of the *townscape*, as well as the prevailing functional theories of urban structure to teach students 'how to approach the physical characteristics and how to understand the spatial relationships of existing urban environments' (1973, pp. vii-viii).

From the mid-1950s until the mid-1970s, most urban geographers were caught up in the quantitative revolution that swept through the social sciences. The kind of painstaking studies of urban morphogenesis that were being conducted by researchers in Europe – as exemplified by the work of M.R.G. Conzen (1960) – were relatively ignored by Canadian urban geographers, in favour of studies of contemporary urban issues (largely economic) involving numerical data that could more easily exploit the computerized techniques and quantitative models dominating geography and regional science. Nevertheless, several works that could be considered externalist-cognitive studies of the built environment did manage to see the light of day during this early period: Crerar (1957) conducted a detailed analysis of lot sizes for his study of development in Vancouver; Camu (1957) performed a classic geographical analysis of housing types in Montréal;¹ and Watson (1959) looked at 'relict' built form features in Halifax (1959). Kerr and Spelt's (1965) *The changing face of Toronto* is probably the first major

geographical work on a Canadian city to devote considerable attention to morphology. Kerr and Spelt offer a comprehensive account of the various natural, economic, political, and technological forces behind the historical evolution of Toronto.

Perhaps the most influential scholar in Canadian urban geography is Larry Bourne (University of Toronto).² His dissertation research – supervised by Brian Berry at the University of Chicago – on the redevelopment process in Toronto was extremely innovative in its exploration of changing land uses and densities in relation to prevailing theories of urban structure (Bourne, 1967). Over the past four decades Bourne has produced an enormous body of scholarly work on a variety of subjects – urban systems, urban social structure, housing markets, neighbourhood revitalization, urban governance, metropolitan development – which has contributed to our overall understanding of various processes driving urban morphogenesis (e.g. Bourne, 1971, 1982, 1989, 1996, 2001; Bourne *et al.*, 1973; Bourne *et al.*, 2003). Nevertheless, very little of his work (if any of it) has dealt explicitly with the physical elements of the urban environment – buildings, plots/lots, streets – that are considered the 'common ground' of all urban morphologists (Moudon, 1997). Bourne is not alone in this regard, as neglect of the morphological dimensions of the built environment has long been common among leading North American urban geographers who, despite widespread use of the phrase *urban form(s)*, are typically more concerned with employment patterns, population densities, and urban structure at metropolitan and regional scales (e.g. Bunting and Filion, 1999; Shearmur and Coffey, 2002).

Urban historical geographer Peter Goheen claimed that 'the neglect of morphology in the practice of urban geography in North America is of long standing' (1990, p. 376). During the mid-twentieth century, Canadian urban geographers and historical geographers mostly worked in isolation from each other, the latter camp largely rejecting the lure of quantification (perhaps due to a lack of relevant data, as much as any epistemological conviction).

This divergence could account for the general paucity of research explicitly on urban morphology, a pursuit that is altogether urban, historical, and geographical. Eventually, as public interest in the 'urban question' peaked in the 1960s, historians and historical geographers became increasingly interested in urban issues. In North America, the 'new urban history' was born in the late-1960s, with an emphasis on interdisciplinary studies and 'everyday' city dwellers and urban landscapes. In Canada, the *Urban History Review* was inaugurated in 1972 and has remained the most important homegrown venue for exchanging ideas about the historical evolution of cities (for reviews of Canadian urban history, see Artibise and Stelter, 1981; Poitras, 2003; Sies, 2003; Stave, 1980).

Canadian urban historians have devoted relatively more attention to urban form than their counterparts in the United States. A possible reason for this rests in their disciplinary influences: as prominent urban historian Gilbert Stelter suggests, 'American urban history is often closely associated with social history and the related social sciences, while in Canada, as in Britain, the influence of the more physically oriented disciplines – especially geography, architecture and planning – are more apparent' (1982, p. 2). Stelter, and other leading Canadian urban historians such as Frederick H. Armstrong (1986), Alan Artibise (1977), Paul-André Linteau (1985) and John C. Weaver (1982), were clearly influenced by British urban historian H.J. Dyos, in the way that they explore connections between a society's culture and the form of its cities. Stelter, together with Artibise, co-edited four influential early volumes (Artibise and Stelter, 1979; Stelter and Artibise, 1982, 1984, 1986) that include chapters on various factors influencing the evolution of urban forms, such as town planning proposals (Bloomfield, 1982; Linteau, 1982); zoning and planning legislation (Moore, 1979; Smith, 1979); land speculation (Doucet, 1982); patterns of land development (Foran, 1979) and subdivision practices (Ganton, 1982).

One of the earliest, and perhaps still the

most comprehensive, study of the morphogenesis of a Canadian city is *Montréal en Evolution* (1974) by the University of Edinburgh-trained architectural historian Jean-Claude Marsan. This impressive volume examines the history of Montréal's urban and architectural development over three centuries from the first fort to the modern skyscrapers of today. Although the Université de Montréal architecture professor clearly uses an externalist-cognitive approach, his lucid treatment of the complex physical evolution of the city has been influential for teaching urban morphology from all perspectives, and it has even served as source material for an educational programme hosted by the author on Québec television!

Despite Goheen's claim about 'the neglect of morphology,' there have been a considerable number of important morphological studies that have been conducted by his fellow urban/historical geographers in Canada. The influence of the so-called 'British tradition' of urban morphology on Canadian urban form research is perhaps best seen in the collaborative works on Toronto by urban historical geographers Gunter Gad and Deryck Holdsworth while they were colleagues at the University of Toronto. Holdsworth studied with M.R.G. Conzen at the University of Newcastle upon Tyne, and Gad attended lectures by the urban geographer Arthur Smailes while a student in London. The influence of Conzen's ideas is clear in their impressive set of papers on emergence and form of the high-rise office building and the morphogenesis of King Street in Toronto (Gad and Holdsworth, 1984, 1985, 1987a, b, 1988).

Over the last two decades or so increasing public interest in urban issues such as affordable housing, suburban sprawl and transportation systems – problems fundamentally tied to urban morphology – has corresponded with a noticeable rise in Canadian research on urban form. For example, the popular undergraduate text *Canadian cities in transition* (2000), edited by geographer Trudi Bunting and planner/ political scientist Pierre Filion of the University of Waterloo, contains chapters on the evolving patterns of urban growth and

form of the last century (Filion *et al.*, 2000), a consideration of built form in relation to flows of investment and energy (Olson, 2000), and the possibilities for an ecological restructuring of urban form (Tyler, 2000). The text is soon to be released in its third edition since 1991.

The 1990s was 'the golden age of Canadian housing research' claims urban historical geographer Richard Harris (2000a, p. 458); much of this research contains a morphological dimension. In *Homeplace*, Ennals and Holdsworth (1998) illustrate the incredible variety of housing forms and types appearing across Canada and they explore the social, cultural and economic forces behind their production, evolution and consumption. Holdsworth argued elsewhere that the 'house-as-key-to-diffusion tradition within American cultural geography [places] undue emphasis on form and type at the expense of other factors that tease out social and economic meanings' (1993, p. 95). On the other hand, 'new cultural geographers' (including several affiliated to the University of British Columbia) have explored the various social, political and cultural values involved in the production of urban landscapes by interpreting the built environment as a landscape text linked to multiple systems of meaning (e.g. Ley, 1987; Holdsworth, 1986, 1990). Urban historical geographers have produced a number of significant case studies of the origins, evolution, habitation, meanings and symbolic values of specific dwelling forms, such as apartment buildings (Dennis, 1994, 1998), government-provided wartime housing (Evenden, 1997), alley housing (Carey, 2002), and the unique 'plex' housing of Montréal (Gilliland and Olson, 1998; Hanna, 1986). In their impressive history of North American housing, Doucet and Weaver (1991) examine house designs in relation to the evolution of land development and construction practices. The impact of government housing policies and municipal regulations (or the lack thereof) on residential forms has also been considered in a number of studies by Harris (1991, 1996) and his students (Harris and Shulist, 2001;

Sendbuehler and Gilliland, 1998). Harris has also written extensively about the influence of the owner-builder in the making of residential landscapes, particularly on the urban-suburban fringe (Harris 1996, 1997, 2000b), and others have contributed 'micro-morphological' case studies of how people adapt and expand their dwelling spaces to meet changing needs and aspirations (Adams and Sijpkens, 1995; Evenden, 1983; Gilliland, 2000).

In *Creeping conformity*, Harris (2004) examines the historical evolution of Canada's suburbs as driven by the housing market and associated forces of migration, employment shifts, transportation innovations, changing aspirations and the role of the government. The urban geographers Jason Gilliland (1996, 2000), Larry McCann (1996, 1999) and Chris Sharpe (2005) have also explored the planning ideas and cultural values behind the creation and evolution of early garden suburbs in Canadian cities. Scholars of contemporary suburbs have devoted considerable attention to new features in the retail landscape, such as 'mega-malls' and 'big box' retail (Hopkins, 1990; Johnson, 1991; Jones and Doucet, 2001; Smith, 1991). In their study of 'Asian theme malls', Preston and Lo (2000) consider how immigration has had an impact on the changing form of commercial developments in the suburbs. Emerging forms of new 'suburban downtowns' have also received consideration, particularly in discussions about the future prospects of old city-centre downtowns (Fischler, 2001; Relph, 1991).

The dynamic relationship between transportation and urban form has been explored in numerous articles and a recent PhD dissertation (Serdouk, 2005). Works dealing *explicitly* with transportation and the built environment include studies of changes to the street network (Gilliland, 1999, 2002) and waterfront redevelopment (Gilliland, 2004; Gordon, 2000); whereas most other studies examine relationships between transportation and changing urban structure, or the emergence of a 'dispersed city form' (e.g. Bunting and Filion, 1999).

Externalist-normative studies: scientific prescriptions for healthier cities

Externalist-normative morphological studies are rare in Canada. Contributions of this sort include works arising from researchers who develop externalist explanatory frameworks and attempt to translate them into operational design tools or planning prescriptions for the 'good city'. The influential German-Canadian planner Hans Blumenfeld³ argued that 'prescription can only work in the framework of prediction' (1957, p. 171). Accordingly, many of Blumenfeld's early essays focusing on urban form could be considered primarily as externalist-cognitive (e.g. Blumenfeld, 1943, 1949, 1975). However, upon reading the full corpus of his work, it becomes clear that these earlier writings laid the foundation for his later normative works containing creative ideas for 'human scale' in urban design (1953, 1957, 1962b), regional planning (1960) and public transportation (1961, 1962a).

Several externalist-normative studies on urban form by planners and engineers have been tied to prescriptions for more 'sustainable' modes of transport and development, 'smart growth', and an 'ecological restructuring' of urban form (Curran and Tomalty, 2003; Filion, 2003; Filion and Hammond, 2003; Grant *et al.*, 2004; Luka 2005; Luka and Lister 2000; Tyler, 2000). A relatively small, but expanding group of researchers is exploring the links among urban form and 'walkability' and human health. Among the most visible participants in this area is University of British Columbia planner Larry Frank. Frank and colleagues examine how different built environments can make it easier (or harder) to incorporate physical activity – especially walking or cycling – into everyday activities (Frank *et al.*, 2003; also Doyle-Baker *et al.*, 2004). They also suggest that a link is emerging between urban forms, such as suburban sprawl, and a plethora of health-related problems: for example, cardiovascular disease, respiratory ailments, and mental health problems (Frumkin *et al.*, 2004). This research is externalist-normative as it

looks for associations between urban form and healthy and unhealthy behaviour in order to prescribe health-promoting changes in planning and development. As experts in defining and measuring the built environment, urban morphologists have much to contribute to this line of enquiry.

In another important application of urban morphology, climatologists, engineers and urban design professionals speak a similar (computer-based) language of modelling and simulation to explore urban phenomena such as 'wind tunnels' and 'heat islands' (Grimmond and Oke, 1999; Oke, 1988). A typical application can be seen in the work by Bosselmann and colleagues (1995), who modelled downtown Toronto to simulate the potential effect of future development on street-level conditions of sun, wind and thermal comfort. This group of environmental scientists studies the built environment to identify alterations for improving human health and quality of life in cities (Oke, 1984; Pressman, 2004, 1994).

Discussion and conclusion

Despite our best efforts, we are not so naïve as to believe we have managed to cover all of the most significant morphological works in such a short paper. Canadian contributions to the study of urban form are numerous, greatly varied in approach and widely dispersed in origin. Upon careful review of the literature, it was revealed that the most significant contributions to the study of urban form in Canada have come from architects/planners in Québec who have adopted a typomorphological approach, and urban geographers/historians throughout the country, who typically examine urban form in relation to the forces underlying its evolution. Although these two camps have largely worked in isolation for the past half century, oblivious of the contributions each other has made, ongoing interdisciplinary collaborations among a new generation of researchers in Canada such as François Dufaux, Pierre Gauthier, Jason Gilliland, Paul Hess, Nik Luka, Bev Sandalack

and Geneviève Vachon – exemplified by their contributions to the International Seminar on Urban Form – suggests that the ‘two solitudes’⁴ are coming together.

By reviewing significant contributions to urban form research according to their particular epistemological perspective one is not constrained by traditional disciplinary boundaries and one can better recognize the similarities among works produced by researchers from different backgrounds (as well as the differences in research conducted within a single discipline). Furthermore, by reading this paper alongside Gauthier and Gilliland (2006), one can see how specific Canadian contributions, and the historiography of Canadian urban morphology more generally, are similar to or different from research in other countries, and how particular intellectual traditions of Italy, France, Britain, and the United States have migrated to Canada.

Notes

1. According to the geographer Jim Simmons (1967), the origins of urban geography as a separate field of study in Canada can be traced to a session at the Sixth Meeting of the Canadian Association of Geographers (1956) chaired by Ed Pleva (inaugural chair of geography at the University of Western Ontario, 1948-68). The papers by Crerar and Camu were among the six in this groundbreaking session.
2. In 2005, a *festschrift* for Bourne was held at the Fifty-fourth Meeting of the Canadian Association of Geographers at the University of Western Ontario (where he began his career) involving nearly 40 presentations to honour his academic legacy.
3. German-born Blumenfeld migrated to Canada via the United States in 1955. He was a practising planner and taught at the University of Toronto (see Spreiregen (1967, 1978) for selected essays and a bibliography of Blumenfeld’s work). We might also consider the contributions of another urban luminary – Jane Jacobs – here, as she has written all but one of her books since moving to Toronto in 1968; however, it was that one book she wrote in New York City – *The death and life of great American cities* (Jacobs, 1961) – that makes the most important contribution to our knowledge of city form, and has guided the activities of city planners the world over.
4. *Two solitudes* is the title of a classic Canadian novel by Hugh MacLennan (1945) and a phrase often used to embody the differences between French and English Canada. We also use it here to represent the now weakening disciplinary divide in morphology research between the design professionals (architects and planners) and social scientists (urban historians and geographers).

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