Notes from Buenos Aires

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The Climate of Buenos Aires

The climate of Buenos Aires is characterized by mild winters, hot and humid summers and significant rainfall distributed throughout the year. Low average wind speeds and reasonable levels of sunshine contribute to generally comfortable conditions in outdoor spaces during most months of the year.

These conditions are reflected in the character of traditional housing. The colonial house, for instance, was organized around the patio, an important feature extensively used as a multi-purpose outdoor room, while laundry and clothes drying took place in a service patio or on the flat roof. Wide — covered but open — galleries not only provide a protected transitional living space between indoors or outdoors, they were also used for circulation between rooms, though secondary doors allow internal connections on colder winter days.

Low rise buildings with fully openable windows and partially glazed double doors, allow direct contact with the outdoor space. In this case, patios and galleries are typical architectural features that encourage outdoor living. Although paved, a "green character" is achieved, with creepers and climbers like jasmines, honeysuckle or bougainvillea, providing a refreshing and shaded area. In this way, patios are partially covered in summer while allowing good sun penetration in winter.

Open doors directly connected to outdoor spaces allow the light breeze from the river to improve comfort conditions in summer. The traditionally low urban development favoured the penetration of breeze in the urban tissue.

The smaller urban house popularly known as "sausage house", *casa chorizo,* and the modest rural house, present a row of rooms connected by an open gallery which allows a similarly close relation between the indoor and outdoor space and the intermediate gallery. Paved patios with green roofs and walls but no grass provide a comfortable microclimate in summer, due to grape wines, creepers or climbers with distinctive aromas. While patios are shaded in summer, the autumn pruning and the loss of leaves give direct winter sunlight indoors and outdoors. The advantage of the linear arrangement is the potentially improved orientation for all the rooms, as a

gallery facing towards the equator allows the sun to penetrate in winter while providing shade in summer.

At the urban scale, streets, markets and plazas provided useful outdoor space that was comfortable for much of the year. Low traffic levels and the absence of internal combustion engines meant that streets were convenient spaces for social contact with little noise and danger.

An evaluation of these traditional solutions shows that the architectural response emphasizes comfort in the summer and provides less comfort in winter. For heating, charcoal was used in portable braziers, placed in the centre of rooms. The high levels of ventilation produced cold draughts while reducing the potentially dangerous fumes.

In outdoor spaces, the end of the traditional era saw an important development of vegetation as a decorative and protective element in outdoor spaces. The extensive river-front parks and botanical gardens of Buenos Aires show the influence of exotic plants and imported concepts of landscape design. However, they also show the importance of shaded outdoor space, especially near the river where shade and cooling breezes encourage intensive use in summer.

In the Pampa region around Buenos Aires, exotic trees such as the eucalyptuses were introduced to provide wind protection and enclosure for the large farms *(estancias)* as well as for the extensive cultivated areas. Though the motivation for these changes may have been principally visual, the modification of the microclimate around the farm house has certainly improved comfort conditions too.

Use of conventional outdoor space

From the turn of the century, a series of factors produced a progressive modification of the traditional building forms and the character of outdoor private and public spaces. Foreign influences introduced the "compact" house, with less direct contact between indoor and outdoor spaces. Circulation areas were incorporated in the indoor space.

As imported coal became the cheapest fuel, fires and chimneys became common, notably improving winter comfort. The compact house form, without protective galleries, had greater exposure to summer sun and less effective conditions for summer ventilation. Multistoried buildings with larger but only partially openable windows reduced direct access to outdoor spaces.

At the urban scale, imported steel structures allowed the enclosure and roofing of public spaces such as markets, railway stations and the central patios of office buildings. These improvements contributed to the introduction of northern European living styles as opposed to the Mediterranean life styles that strongly characterized traditional housing. Covered spaces provided improved winter comfort and

protection from rain. At the same time, these building types, with less emphasis on outdoor space, reduced the levels of summer comfort in the urban environment.

Modern technology, commercial trends and life styles

Introduction of air-conditioning and relatively cheap electricity allows artificial cooling in summer. This was first implemented in offices, often because large windows, low thermal inertia and inappropriate design caused severe overheating of these indoor spaces. Air-conditioning then spread to high income housing and shopping centres. It is now increasingly found in middle class homes, despite the high running costs, as "comfort" expectations rise.

Air-conditioning is both a cause and effect of the change in building design, although this is seldom acknowledged as a vital influence in modern architectural trends. Higher buildings with more fixed windows, lighter construction and deeper plans need mechanical air-conditioning for comfort.

While air-conditioning means even less contact between indoors and outdoors, it also allows a more intensive use of indoor space. Indoor areas are commercially more "productive", with longer hours of use and constant, unvarying "optimum" conditions.

The improvement of indoor climate control and the increasing intensity of urban life is producing a critical vicious circle. On the one hand, artificial conditioning of buildings encourages indoor space use at a high energy cost, with a strong commercial incentive to ensure constant public flow and intense use. On the other hand, and as a result of this trend, air pollution, noise and heat emissions make urban outdoor spaces less attractive.

The decline of local street markets contrasting with the increasing development of upper class shopping centres and commercial buildings in central areas provides a clear example. This trend is strongly influencing urban patterns and traffic layouts with the concentration of high rise buildings and parking facilities, depending on high cost mechanical conditioning.

At the same time, public outdoor spaces are used intermittently, according to the daily and seasonal variation of climatic conditions. The open nature of these spaces, generally publicly owned and maintained, with varying intensity of use makes maintenance difficult. Free access means that they are often seen as being "unproductive" in economic terms.

Modern technology also influences daily and seasonal activity patterns in undesirable ways from the point of view of a rational response to climate and local environment. The traditional shopping and banking hours allowed the afternoon siesta in hot months, avoiding outdoor activity in the hottest hours of the day. Modern electronic banking tends to impose standard banking hours all over the country, irrespective of climatic differences.

School holidays were programmed to avoid the hottest summer months in hot climates, while in mountain areas, holidays coincided with the months of snow, reducing problems of access and heating at school.

This trend is not new. Less than two centuries ago, each town had its own local time, based directly on the movement of the sun, a tradition that is still maintained in Saudi Arabia today. However, standard time became essential with the introduction of the railway (rapid and punctual travel), and with improved portable clocks and watches.

Time zones and national standard time mean that school hours that are convenient for Buenos Aires, allowing children to arrive by daylight, are inappropriate for Mendoza, 10' longitude further west, where the sun rises 40 minutes later. The comfort conditions in outdoor spaces have suffered, though within conditioned spaces, acceptable standardized conditions can be maintained by heating, cooling and artificial lighting.

However, modern technology may now allow more flexible working hours than those imposed by traditional factory and office organization. This flexibility has social, environmental and administrative advantages. While employee satisfaction, and labour availability may be the main incentives for employers, employees can adjust their working hours to be able to use and enjoy outdoor space during the more favourable hours of the day.

The future

Although the clock cannot be turned back to return to traditional living patterns that were more closely related to climatic variations, the challenge may be focussed on how can we offer improved conditions in the present situation without lowering the standards achieved by technical development or without ignoring social expectations. "Back to nature" will not appeal if it implies less comfort, but environmental concern may increase the resources we are prepared to spend in order to improve urban outdoor comfort.

In the hot-dry and warm-humid climates of the developing world, the contrast between modern and traditional behaviour is especially striking. Though outdoor living opportunities are urgently needed to supplement the limited indoor space, many local professionals and consumers seem to be more interested in adopting "modern" life styles and copying the First World than in responding to local requirements.

However, energy costs will rise and the environmental impact of high energy use in buildings will increase. These new restraints offer an incentive to analyze, revise and revert current trends in architecture and urban design. Planners, architects and urban managers need to identify and promote viable alternatives that will undoubtedly include the more intensive use of outdoor space, characterized as a real "living area", both at the domestic and urban scales.

Today's reality of increasing energy demand and scarce resources shows that many of these high costs, high consumption and high impact buildings will have a rather short life. If we are to avoid producing a self-destructing urban environment, low energy, low cost, flexible and intensively used urban spaces will play a key role. The quality of outdoor spaces, resulting from a bioclimatically responsive design approach, is not only relevant to the achievement of comfortable living areas outside; it will also promote the favourable impact of climate in indoor areas.