

Discussion article

City of Bubbles¹ (Summary)

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1-SPHERES. The world is spherical. Nicolaus Copernicus in his book *De revolutionibus orbium coelestium* (1473)² emphasises the perfection of the spherical shape for the structuring of the universe on different scales, from the drop of water to the stars.

2-THE CITY. The urban environment generates opposing visions.³ It is the most complex artefact created by humanity, containing the best and the worst of civilisation. The socio-spatial distribution of its population presents great inequalities and in Latin America are found the greatest differences.⁴ The city can be *heaven* or *hell*.

3-WORLD URBANIZATION. United Nations data⁵ indicate an evolution towards planetary urbanisation.⁶ In this urbanisation, the majority of the population will be located in areas of poverty. A world urban hierarchy is consolidated, which gives validity to the *Central Places Theory* (1933)⁷ through the alpha++ and alpha+ cities,⁸ many *Global Cities*⁹ with great influence in geographic space and cyberspace.¹⁰ Megacities will enter the global

¹ Buenos Aires experience 2020.

² Copérnico, Nicolás, 1965, *La Revoluciones De Las Esferas Celestes. Libro Primero, Los Fundamentos*, Buenos Aires, Editorial Universitaria de Buenos Aires.

³Jones, Emery, 1966, *Town & Cities*, Oxford, Oxford University Press.

⁴UNDP, 2019, *Human Development Report 2019. Beyond income, beyond averages, beyond today: Inequalities in human development in the 21st century*, New York, <http://hdr.undp.org/en/content/human-development-report-2019>

⁵ UN, 2003, *World Urbanization Prospects: The 2003 Revision*, New York, United Nations.

⁶Soja, Edward & Kanai, J.Miguel, 2007, The urbanization of the world, in Burdett, R. &Sudjic, D. (Eds.) *The Endless City*, London, Phaidon, pp. 54-69.

⁷ Hall, Peter, 2010, Megacities, World Cities and Global Cities, in Buijs, Steef; Tan Wendy & Tunas,Devisari (Eds.) *Megacities. Exploring a Sustainable Future*, Rotterdam, 010 Publisheres, pp. 34-44.

⁸ The World According to GaWC 2018 (Globalization and World Cities, Geography Department, Loughborough University), Posted, November 13, 2018,<https://www.lboro.ac.uk/gawc/world2018t.html>

⁹Sassen, Saskia, 2001, *The Global City: New York, London, Tokyo*, New Jersey, Princenton University Press

¹⁰Buzai, Gustavo D., 2013, Technological Dependency and the Internet: Latin American Access from Buenos Aires, 2001-2013. *Journal of Latin American Geography*, 12(3), 165-178.

network with hyper-technological connections and, at the same time, large areas of precariousness.¹¹

4-POVERTY MAPS. Cities present the greatest social distances at the smallest geographical distances. *Poverty maps* (1903)¹² initiate a traditional field of studies on urban socio-spatial differentiations that is still relevant today.

5-URBAN MODELS. The social structure of the city shows spatial regularities that can be modelled. The first contribution comes from the Chicago School.¹³ The classic models are the *ring model* (1925),¹⁴ the *sector model* (1939)¹⁵ and the *multiple nuclei model* (1945).¹⁶ They match that the social map increases its favourable conditions towards the periphery.

6-FACTORIAL ECOLOGY. *Human Ecology* studies society in its habitat.¹⁷ *Human Geography* can focus on this perspective¹⁸ by incorporating theories from Biology to explain spatial distributions of the population. When the object of study is the city, it becomes *Urban Ecology* and the search for underlying factors transforms it into *Factorial Ecology*.^{19,20} The latter, based on quantitative spatial analysis, allows the structure of classical models to be tested.²¹

7-DISTORTION. Classical models do not fit the socio-spatial structure of Latin American cities. *Ecological evolutionism* cannot be applied²² and differences are verified between the cities of the two Americas.²³ Latin American cities focus particular attention²⁴ by presenting an inverse social

¹¹Davies, Mike, 2006. *Planet of Slums*, London, Verso.

¹²Booth, Charles, 1902-1903, *Labour and Life of the People in London*, Macmillan, London, (2^{da} ed., 17 vols).

¹³Hall, Peter, 2014, *Cities of Tomorrow. An Intellectual History of Urban Planning and Design since 1880*, Chichester, John Wiley & Sons.

¹⁴ Burgess, Ernest W., 1925, The growth of the city: an introduction to a research project, in Park, Robert; Burgess, Ernest & McKenzie, Robert (Eds.) *The City*, Chicago, The University of Chicago Press, pp. 47-62.

¹⁵ Hoyt, Homer, 1939, *The Structure and Growth of Residential Neighbourhoods in American Cities*, Washington D.C., Federal Housing Administration.

¹⁶ Harris, Chauncy & Ullman, Edward, 1945, The Nature of Cities, *The Annals of the American Academy of Political and Social Sciences*, 142, 7-17.

¹⁷Hawley, Amos, 1950, *Human Ecology: A Theory of Community Structure*, New York, Roland Press.

¹⁸ Barrow, Harlan, 1923, Geography as Human Ecology, *Annals of the Association of American Geographers*, XIII(1), 1-14.

¹⁹Berry, Brian J.L. & Kasarda, John D., 1977, *Contemporary Urban Ecology*, New York, Macmillan.

²⁰Davies, Wayne K.D., 1984, *Factorial Ecology*, Aldershot, Gower.

²¹ Racine, Jean-Bernard, 1972, Écologie factorielle et écosystème spatiaux, dans Bourgoignie, Georges (Éd.) *Perspectives en écologie humaine*, Paris, Editions Universitaires, pp. 152-191.

²²Sjoberg, Gideon, 1960, *The pre-industrial city. Past and Present*, Glencoe, The Free Press.

²³Schnore, Leo F., 1965, On the spatial structure of cities in the two Americas, in Hauser, Philip & Schnore, Leo (Eds) *The Study of Urbanization*, New York, John Wiley & Sons.

²⁴ Hoyt, Homer, 1964, Recent Distortions of Urban Classical Models of Urban Structure, *Land Economics*, 40(2), 199-212.

map.²⁵ Buenos Aires is a clear example of the evolution of the social map towards an industrial city in the maximum process of deindustrialisation.

8-URBAN MODELS IN LATIN AMERICA. New models were formulated to explain the structural situation of Latin American cities.²⁶ Intermediate sized cities are modelled²⁷ with subsequent adjustments for large cities²⁸ that begin to show large dispersions.²⁹ The evolution is modelled³⁰ arriving to the *island city model* inspired by the socio-spatial structure of Buenos Aires.³¹ Wide seas of poverty with islands of wealth³² formed by enclosed surfaces with private security.³³ The complete characteristics were proposed as a *conceptual-spatial model*.³⁴

9-POSMETROPOLIS. Different ecological spaces³⁵ show the post-modern city³⁶ that contains all the structures of the post-metropolis.³⁷ The megacities of Latin America present new characteristics³⁸ in a current typology.³⁹ *Flexcity, cosmopolis, exopolis, fractal city, carcereal*

²⁵Buzai, Gustavo D. & Marcos, Mariana, 2012, The Social Map of Greater Buenos Aires as Empirical Evidence of Urban Models, *Journal of Latin American Geography*, 11(1), 67-78.

²⁶Buzai, Gustavo D., 2016, Urban models in the study of Latin American cities. *Innsbrucker Geographische Studien*, 40, 271-288.

²⁷Griffin, Ernest & Ford, Larry, 1980, A model of Latin American city structure, *Geographical Review*, 70(4), 397-422.

²⁸ Ford, Larry, 1996, A new and improve model of Latin American city structure, *Geographical Review*, 86(3), 437-440.

²⁹ Burton, Ian, 1963, A restatement of the dispersed city hypothesis, *Annals of the American Association of Geographers*, 53, 285-289.

³⁰ Borsdorf, Axel; Bärh, Jurgen&Janoschka, Michael, 2002, Die DynamikstadtstrukturellenWandels in Lateinamerikaim Modell der lateinamerikanischenStadt, *Geographica Helvetica*, 57(4), 300-310.

³¹ Janoschka, Michael, 2002, "Stadt der Inseln" Buenos Aires: Abschottung und Fragmentierungals KennzeicheneinernevenStadtmodells, *RaumPlanung*, 101, 65-70.

³² Berry, Brian J.L., 1982, *Islands of Renewal, Seas of decay: The Evidence of Inner-city Gentrification*, Pittsburgh, Carnegie-Mellon University.

³³ Coy, Martin &Pohler, Martin, 2002, Gated communities in Latina American Megacities: Case Studies in Brazil and Argentina, *Environment & Planning B: Planning & Design*, 29, 355-370.

³⁴ Buzai, Gustavo D., 2014, *Mapas Sociales Urbanos*, Buenos Aires, Lugar Editorial.

³⁵ Banham, Reyner, 1971, *Los Angeles, The Architecture of Four Ecologies*, London, The Penguin Press.

³⁶Soja, Edward, 1989, *Postmodern Geographies. The Reassertion of Space in Critical Social Theory*, London, Verso.

³⁷Soja, Edward, 2001, *Postmetropolis. Critical Studies of cities and regions*, Oxford, Blackwell.

³⁸Buzai, Gustavo D., 2020, Megaciudades de América Latina. Conceptos, modelos y Geografía de los procesos de estructuración urbana, *Anuario de la División Geografía*, 14, 1-27.

³⁹Soja, Edward, 1997, Six Discourses on the Posmetropolis, in Westwood, Sallie & Williams, John (Eds.) *Imagining Cities. Scripts, signs, memories*, London, Routledge, pp. 19-29

*archipelagos*⁴⁰ and *simcity* are verified. There is fractality in the expansion⁴¹ in areas of recognisable identity⁴² and concrete materialities as support for the mental map⁴³ of the community.

10-GENERIC CITY. Sites for the global scale. *Non-places*⁴⁴ advance, and the *generic city*⁴⁵ begins to consolidate. The urban identity provided by the centre diminishes and the periphery consolidates with the *edge cities*⁴⁶ in the framework of the *privatopia*.⁴⁷ The generic city stands out in its hyper-technological vocation when many aspects of life have been transferred to cyberspace.

11-QUARTER-HOUR CITY. Sites for the local scale. The quarter-hour city has an empirical objective.^{48,49} It attempts to re-establish the human scale in a romantic perspective⁵⁰ that confronts development by large engineering interventions.⁵¹ A complete life at a distance of no more than 15 minutes from homes is proposed in the *paradigm of immobility* in adapted spaces⁵². Appeals to *topophilia*⁵³ through sentimental connection.

12-CENTRE-PERIPHERY. The city can be modelled like an egg, from compact hard-boiled eggs to scrambled eggs without precise boundaries.⁵⁴ Nowadays, the main centre loses its predominance in both the generic city and the quarter-hour city. Different centralities are consolidating, changing the concept of the city⁵⁵ and the urban way of life is spatially extended⁵⁶ through the use of technology. It becomes difficult to differentiate the urban from the rural.⁵⁷ The centre of Buenos

⁴⁰Davies, Mike, 1990, *City of Quartz*, London, Verso.

⁴¹Batty, Michael & Longley, Paul, 1994, *Fractal Cities: A Geometry of Form and Function*, London, Academic Press.

⁴²Zorbaugh, Harvey W., 1926, The Natural Areas of the City, *Publications of the American Sociological Society*, 20, 128-197.

⁴³Lynch, Kevin, 1960, *The Image of the City*, Cambridge, MIT Press.

⁴⁴Augé, Marc, 1992, *Non-Lieux. Introduction à une anthropologie de la surmodernité*, Paris, Le Seuil.

⁴⁵Koolhaas, Rem, 1995, The Generic City, in O.M.A., Koolhaas, Rem & Mau, Bruce, *S, M, L, XL*, New York, The Monocelli Press, pp. 1248-1264.

⁴⁶Garreau, Joel, 1992, *Edge City. Life in the new frontier*, New York, Anchor Books.

⁴⁷MacKenzie, Evan, 1994, *Privatopia: Homeowner Associations and the Rise of Residential Private Government*, New Haven, Yale University Press.

⁴⁸Chaire ETL, 2020, *La ville du ¼ d'heure*, Paris, Université Paris I – PanthéonSorbone, EntrepreneuriatTerritoire Innovation (Sous la direction de Carlos Moreno. Rédactrice Principale: Marina Garnier)

⁴⁹Moreno, Carlos, 2020, *Droit de cité. De la "ville-monde" à la "ville du quart d'heure"*, Paris, L'Observatoire.

⁵⁰Jacobs, Jane, 1961, *The Death and Life of Great American Cities*, New York, Random House.

⁵¹Ballon, Hilary & Jackson, Kenneth (Eds.), 2007, *Robert Moses and the Modern City. The Transformation of New York*, London, W.W. Norton & Company.

⁵²Martin, Leslie & March, Lionel, 1972, *Urban Spaces and Structures*, London, Cambridge University Press.

⁵³Tuan, Yi-Fu, 1974, *Topophilia: a study of environmental perception, attitudes and values*, New York, Prentice Hall – Englewood Cliffs.

⁵⁴Price, Cedric, 1982, *The City as an Egg*, Tree-part drawing.

⁵⁵Chueca Goitia, Fernando, 1990, *Breve historia del urbanismo*, Madrid, Alianza.

⁵⁶Wirth, Lewis, 1938, Urbanism as a way of life, *American Journal of Sociology*, 44, 1-24.

⁵⁷Brenner, Neil, 2019, *New Urban Spaces. Urban Theory and the Scale Question*, New York, Oxford University Press.

Aires exemplifies the evolution⁵⁸ by pulses between successive crises.^{59, 60} Urban architecture generates spaces that favour international links⁶¹ and local spaces with global vocation.⁶² Centre and periphery are establishing new balances in the megacity.

13-PANDEMIC. SARS-Cov2 performed a *species barrier passage*⁶³ and a global expansion that took it to the antipodes.⁶⁴ It showed global spatio-temporal compression.⁶⁵ In its spatial evolution analysis, maps showed usefulness in the spatial analysis of health⁶⁶ and on-line GIS⁶⁷ showed global geography.⁶⁸ Technology was also used for citizen control and the loss of freedom was accompanied by extensive quarantines that undermined movement. Real geographic space had maximum friction and the virtual space of the Internet moved many activities to computer screens. The world is at home.

14-DISTANCE DECAY. The importance of *distance-decay* is central to regional⁶⁹ and intra-urban⁷⁰ studies supporting the *fuzzy* logic framework for locational propositions⁷¹ and decision making.⁷² *Distance-decay* defines areas of influence, from cities to people.

15-SCALES. The person, the house, the neighbourhood, the city, the province, the country, the continent and the world. The systemic approach links the totality of levels through the *General Systems Theory*⁷³ and extends its specificities through the *Complex Systems Theory*.⁷⁴ Between the

⁵⁸ Buzai, Gustavo D., 2000, *Características y evolución espacial de los centros de gestión metropolitanos: Buenos Aires (1960-2000), de la modernidad a la posmodernidad*, Luján, Universidad Nacional de Luján, Colección CT-14.

⁵⁹ Keeling, David, 1996, *Buenos Aires: Global Dreams, Local Crises*, New York, John Wiley & Sons.

⁶⁰ Muxí Martínez, Zaida, 2002, *La arquitectura de la ciudad global. La huella sobre Buenos Aires*, Sevilla, Universidad de Sevilla, Tesis Doctoral.

⁶¹ Castells, Manuel, 1994, *The Informational City*, Oxford, Blackwell.

⁶² Klaus, Philipp, 1998, Building Local Places in a Global World, in INURA Zürich (Ed.) *Possible Urban Worlds: Urban Strategies at the End of the 20th. Century*, Basel, Birkhauser-Verlag, pp. 62-65.

⁶³ Shah, Sonia, 2017, *Pandemic: Tracking Contagions, from Cholera to Ebola and Beyond*, New York, Picador.

⁶⁴ Buzai, Gustavo D., 2020, De Wuhan a Luján. Evolución espacial del Covid-19, *Posición*, 3, 1-21.

⁶⁵ Warf, Barney, 2008, *Time-Space Compression: Historical geographies*, London, Routledge.

⁶⁶ Koch, Tom, 2005, *Cartographies of Disease. Maps, Mapping and Medicine*, Redlands, ESRI Press.

⁶⁷ Dempsey, Cailin, 2020, The Johns Hopkins Coronavirus Map Dashboard Receives a Billion Hits a Day, *GIS Lounge*, April 7, <https://www.gislounge.com/john-snows-cholera-map-gis-data/>

⁶⁸ Buzai, Gustavo D., 2018, Geografía Global: la dimensión espacial en la ciencia y la sociedad, *Anales de la Sociedad Científica Argentina*, 263(3), 9-26.

⁶⁹ Von Thünen, Heinrich, 1826, *Der Isolierte Staat in Beziehung auf Landwirtschaft und Nationalökonomie*, Rostok. (English version: Trad. Carla Wartenberg, *The Isolated State*, Pergamon Press, Oxford, 1966)

⁷⁰ Clark, Colin, 1951. Urban Population Densities, *Journal of the Royal Statistical Society*, 114, 490-496.

⁷¹ Malczewski, Jacek, 2006, GIS-based multicriteria decision analysis: a survey of the literature, *International Journal of Geographic Information Science*, 20(7), 703-726.

⁷² Eastman, J. Ronald; Toledano, James & Jin, Weigen, 1993, *GIS and Decision Making*, Geneva: UNITAR.

⁷³ Von Bertalanffy, Ludwig, 1968, *General System Theory*, New York, George Braziller.

⁷⁴ García, Rolando, 2006, *Sistemas Complejos*, Barcelona, Gedisa.

infinitely large and the infinitely small lies the human scale with all its complications.⁷⁵ People participating in different spatial scales with varied spatial scopes experience new ways of relating to places.⁷⁶

16-EMERGENCY. Opposing urban characteristics converge and a synthesis emerges,⁷⁷ in this case a new urban synthesis. We are witnessing the convergence of the generic city with the quarter-hour city and the emergence of the *city of bubbles*. The case of Buenos Aires made it possible to verify this through experience, direct observation⁷⁸ and the use of the *resolutive-compositive method*,^{79,80} approaching concrete materiality.⁸¹ We proceed to the search of the general in the particular and, in this way, achieve unity in diversity.

17-CITY OF BUBBLES. The experience of the violent closures imposed by the management of the pandemic led to the emergence of different bubbles, of *individuals, groups of people, neighbourhoods and cities*. A new aspect of residential differentiation appeared through differentiations⁸² in urban intensity and various exclusions.⁸³ Cities closed and countries ceased to be open,⁸⁴ so there were national bubbles for periods. The case of the megacity Buenos Aires serves to present a model of fractal self-similarity,⁸⁵ (Figure 1).

⁷⁵ De Rosnay, Joel, 1975, *Le macroscope. Vers une vision globale*, Paris, Seuil.

⁷⁶ Robinson, David J., 1989, The Language and Significance of Place in Latin America, in Agnew, John & Duncan, James (Eds.) *The Power of Place*. Abingdon, Routledge, pp. 157-184.

⁷⁷Bunge, Mario, 2003, *Emergence and Convergence: Qualitative Novelty and the Unity of Knowledge*, Toronto, Toronto University Press.

⁷⁸ Mumford, Lewis, 1961, *The City in History*, San Diego, Harcourt.

⁷⁹ Ruiz, Daniel J., 1952, *Elementos de Filosofía*, Buenos Aires, Ángel Estrada.

⁸⁰Baldin, Gregorio, 2020, *Hobbes and Galileo: Method, Matter and the Science of Motion*, Cham, Springer Nature Switzerland AG.

⁸¹Castells, Manuel, 1972, *La question urbaine*, Paris, Maspero.

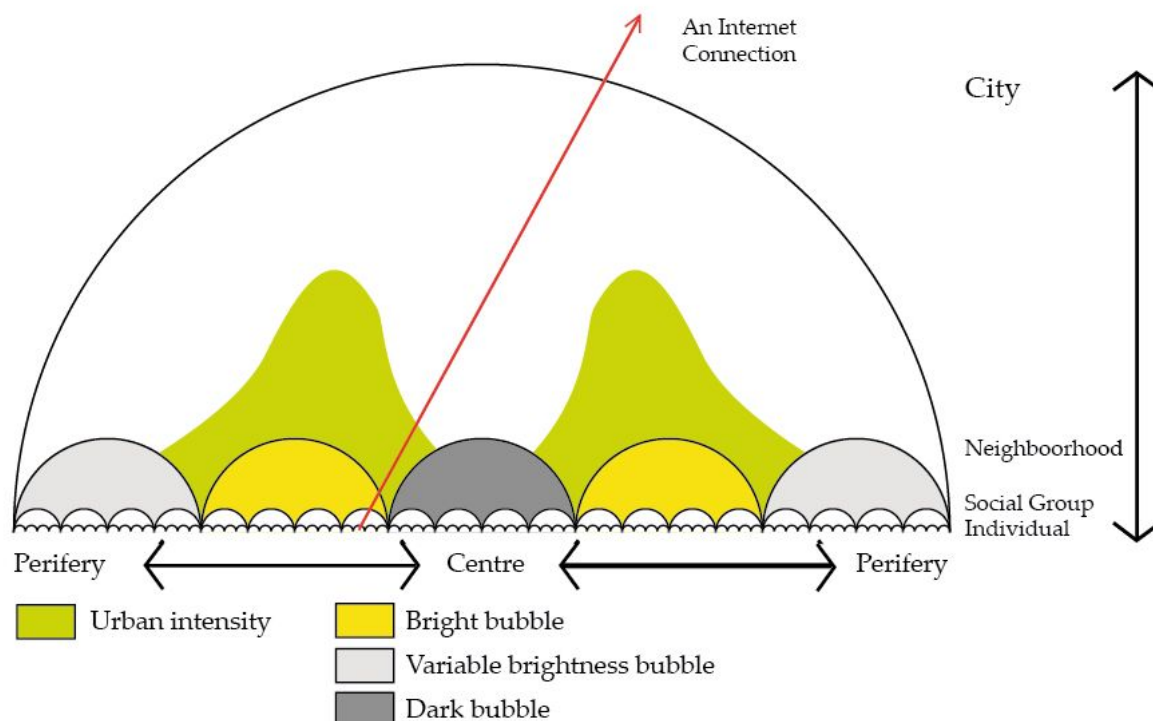
⁸²Timms, Duncan, 1971, *The Urban Mosaic. Toward a Theory of Residential Differentiation*, Cambridge, Cambridge University Press.

⁸³Borsdorf, Axel & Hidalgo, Rodrigo, 2008, New dimensions of social exclusion in Latin America: From gated communities to gated cities, the case of Santiago de Chile, *Land Use Policy*, 25(2), 153-160.

⁸⁴ Cabrales Barajas, Felipe (Ed.), 2002, *Latinoamérica: Países abiertos, ciudades cerradas*, Guadalajara, UNESCO, Universidad de Guadalajara.

⁸⁵Mandelbrot, Benoit, 1977, *Fractals. Form, Chance, and Dimension*, New York, W.H.Freeman& Company.

Figure 1. Bubble City. The Buenos Aires 2020 model in cross-section.



The figure presents the model generated by the bubbles in cross-section inspired by Buenos Aires at the time of the greatest repressive control for the restriction of movement. The intensity function is based on the density ⁸⁶ expanded to volcanic form ⁸⁷ and differentiated according to the axis of growth. ⁸⁸ There are light bubbles and dark bubbles. Physical movement is minimised and a *virtual geography* ⁸⁹ is consolidated. The personal bubble is based on the senses, ⁹⁰ the group bubble can reach the home habitat, ⁹¹ the neighbourhood bubble correlates with the quarter-hour city and limits individual experiences. ⁹² Better possibilities are seen in higher densities. ⁹³ The bubble city

⁸⁶March, Lionel, 1971, *Urban Systems: A Generalised Distribution Functions*, *London Papers in Regional Science*, 2, 157-170.

⁸⁷Haggett, Peter, 1965, *Locational Analysis in Human Geography*, London, Edward Arnold.

⁸⁸ Gormsen, E., 1981, *Die Städte in SpanischAmerika. Einzeit-räumliches Entwicklungsmodell der letztenhundertJahre*, *Erdkunde*, 35(4), 290-303.

⁸⁹Wark, Mackenzie, 1994, *Virtual Geography. Living with Global Media Events*, Bloomington, Indiana University Press.

⁹⁰ Castro Aguirre, Constanancio de, 1997, *La Geografía en la vida cotidiana*, Barcelona, Ediciones del Serbal.

⁹¹Banham, Reyner, 1965, *A Home is Not a House*, *Art in America*, 2, 70-79.

⁹²Sennett, Richard, 2019, *Construir y Habitar. Ética para la ciudad*, Barcelona, Anagrama.

⁹³Grisot, Sylvain, 2020, *Manifestepour un urbanismecirculaire. Pour des alternativesconcrètes à l'étalement de la ville*, Nantes, Dixit.

showed a life of isolation at every level. The Buenos Aires 2020 experience foresees a worrying trend for the megacity, which in its last conurbation process (2012) came to have 14,756,128 inhabitants in 4,078 km².⁹⁴ The unsustainable economic and social situation perforated the bubbles after four months and the new model began to fade away.

18-END. Buenos Aires presented an example of underlying spatial evolution for megacities in Latin America. From the *island city model*, the emergence of Covid-19 shaped the *bubble city model* from the restriction of population movements at different scales in the implementation of the world's longest quarantine. Different spheres were experienced for 7 months, contrasting socio-spatial realities in a lived space that came abruptly to amplify all kind of inequality and continues showing that the city can be *heaven* and *hell*... now seen in the bubble city.

⁹⁴ Buzai, Gustavo; Baxendale, Claudia & Montes Galbán, Eloy, 2021, Megacity Buenos Aires and its most recent conurbation impact, *International Congress of Latin Americanist Geographers*. Warsaw, March, 17-21



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