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Paolo Soleri and America's Third Utopia: The Sustainable City-Region

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Abstract

The ingredients of successful urbanism have been proposed by various scholars. However, their deployment has not always led to successful cities. Utopian visions are intended to help fill this gap. This article analyses Paolo Soleri's main US arcology-based vision: Arcosanti. To what extent does Arcosanti constitute a realizable utopia, when it is only partially built and its chief architect is no longer able to shape the vision's future implementation? It is argued that visionary urbanistic ideas put forward by intellectuals have influenced standard professional practice, pedagogy, and design and planning scholarship on the relationships between natural and built environments and more desirable human behaviours.

Keywords: Sustainable urbanism; utopian visions; U.S. Southwest; Arizona; Arcology.

‘loving a wide range of things in an unsnobbish way is something architects of today don't do. Viva tolerance concerning multicultures and multiple tastes! Viva pragmatism! *A bas* utopia!’

RV, 2001: 613.

1. Introduction

Successful urbanism has been identified as possessing a combination of the following ingredients of success: Market, location, design, financing, entrepreneurship and time (Garvin 1996). However, when the ingredients have been turned into a mere formula the outcomes become typified and tend to be replicated without much consideration for pre-existences, climatic conditions, socio-economic trends, political regimes or cultural norms.

This has led some to propose alternatives to standardized development interventions. Fishman (1994) has analysed the visions of three distinct intellectuals: Ebenezer Howard, Frank Lloyd Wright, and Le Corbusier. Some of these individuals' visions are minor refinements of earlier models, while others constituted radical departures from reality to the point of forming new and

distinct paradigms. Typical elements of utopian communities include: Vision, leadership, critical mass, resources, and a propensity toward effective (i.e. partial and incremental, if not comprehensive and expeditious) dissemination and implementation. A more contemporary interpretation of utopia is provided by Jones (2015, p.213) in a reaction to *Everyday Utopia: The Conceptual Life of Promising Spaces* as ‘happy places where the tyrannical forces of neoliberalism, colonialism, imperialism, capitalism, racism, sexism, ageism, classism, etc. have been remedied and cease to exist (...) utopia is what radical social change looks like.’

The state of Arizona is known nationally for its extensive suburban sprawl (Bruegmann 2005), likely the end-product of a combination of the social *-isms* mentioned above as well as more commonplace factors ranging from desert flat land, temperate-arid climate for most of the year, population growth, burgeoning real estate markets and a modern transportation network. Perhaps as a reaction to this almost perfect growth machine, various architects have developed and implemented utopian visions of ideal cities in this state, including Frank Lloyd Wright (i.e. Broadacre City) and Paolo Soleri (i.e. Arcosanti). These two individuals’ visions are almost diametrically opposed (i.e. Wright’s locational advantage of horizontal land development with automobile circulation contrasts with Soleri’s intensive vertical urban development without reliance on automobiles), in spite of the fact that the Soleri was temporarily a student of Wright.

Earlier accounts of Soleri’s contributions to American urbanism have ranged from full-length books (Wilson 1999; Lima 2013) and documentaries (Mayne 2009: *Blueprint for the Future*, and Madsen et al. 2013: *Paolo Soleri: Beyond Form*) to published conversations (e.g. Strohmeier 2001), partial critiques (e.g. Luke 1997), and reviews (e.g. Busbea 2013) of his work and most significant ideas. However, none of the published pieces have attempted to specifically analyse Soleri’s contributions in the context of the third-generation modernist architects and

America's broadly defined utopias. Therefore, the main purpose of this article is to succinctly analyse the evolution of North American urbanistic visions and to understand how the arcology conceptualization in particular, together with its partial implementation in Arcosanti, has contributed to America's third embryonic utopia: The sustainable city-region.

This paper is guided by these three research questions: What leads certain individuals to push specific visions forward, when they are not necessarily likely to equate the interests of the majority of the population in a specific territory? Does the theory of memes – the propagation of sub-elements of an ideal vision by a myriad of methods – contribute to the spread and reconstitution of that vision's critical elements away from the places where it was initially conceptualized? And to what extent does Arcosanti constitute a realizable utopia, when it is only partially built and its chief architect is no longer able to shape the vision's future implementation.

It is argued that visionary urbanistic ideas put forward by intellectuals, such as Paolo Soleri, have influenced standard professional practice, pedagogy, and design and planning scholarship on the relationships between natural and built environments and more desirable human behaviours. The research methods included: Extensive qualitative analysis and reviews of modern urbanistic conceptualizations, utopian planning, master architects' contributions, and ideal communities, especially arcologies; multiple *in loco* visits to Arcosanti, Taliesin West, and Sun City as well as attendance of events with Paolo Soleri from the mid-2000s until the early 2010s (Figure 1); the succinct comparative analysis of utopian communities in Arizona (Arcosanti), Denmark (Christiania), and India (Auroville); and finally, the distillation of thoughts to the operationalization of ideal communities in the 21st century.

'insert figure 1 here'

The concluding thoughts are fourfold:

- respect for environmental conditions synthesized in various biophilic laws;
- suggested urban form without dictating rigid pre-determined architectonic structures;
- aim for social sustainability relationships that enable life, liberty and the pursuit of happiness;
- the perpetuation of sustainability goals through opportunities for self-realization and actualization within multi-scalar community relations.

The article is structured into six parts. Following this introduction, Part one is the literature review centred on an analysis of three generations of modern architects, their visions and broadly defined American utopias. Part two introduces the three most well-known urbanistic utopias in the state of Arizona. Part three traces Paolo Soleri's artistic, architectonic and philosophical contributions. Part four reviews Soleri's most important arcology – Arcosanti. Part five provides answers to the three research questions. And finally, part six presents some concluding remarks to the operationalization of ideal communities in the 21st century.

2. Literature Review

This review is an attempt at synthesizing a set of architects' and planners' visions and perhaps America's most important utopias. This section then contextualizes the work of an Italian architect, later naturalized American citizen, named Paolo Soleri (1919–2013). Soleri was able to implement his ideal community, christened Arcosanti, in Mayer, Arizona, a rural community approximately 113 kilometres north of Phoenix. The ultimate goal is to understand the extent to which Soleri's vision has influenced America's third utopia: The sustainable city-region.

2.1 Architectonic Generations

Modernism was simultaneously a phase and an architectonic style. International in scope, this architectonic style is also commonly known as brutalism. This label is derived, in part, from the large scale of its built-up structures. Although the United States can proudly claim to have designed and disseminated the skyscraper typology due to the pioneering use of steel frame construction, glass surfaces and elevator technology, around the same time, many European nations were also utilizing reinforced concrete to build some of the world's largest megastructures (Banham 1976). Furthermore, modernist architects started to embrace pop culture themes (e.g. *Archigram*, Team Ten) and to design structures aimed at revolutionizing cities. More recently, Ellin (2013) has argued that a different kind of urban design revolution has taken place in cities. This silent revolution, comprised of integral (arcology) urbanism, is mostly aimed at 'heal[ing] the wounds inflicted upon the landscape by the modern and postmodern eras' (Ellin 2013, 63).

Drew's (1972) book entitled *'Third Generation – The Changing Meaning of Architecture'* identified three generations of modernist architects. Table 1 is an elaboration on Drew's categorization to also highlight the role of modern architects in Latin America (e.g. Oscar Niemeyer) and female individuals with in-depth knowledge of architecture and planning (e.g. Catherine Bauer Wurster) and a recognized professional practice (e.g. Denise Scott Brown).

There is disagreement across disciplinary boundaries about what constitutes an 'urban intellectual'. Distinct publics are known to have portrayed the relevance of those who shape their scholarly and practice agendas differently. Nonetheless, an urban intellectual is commonly understood to be a thinker or a scholar, someone capable of articulating and reasoning a theory, of conveying a vision, and presenting a major idea or simply a conceptual framework. An urban intellectual can perhaps be better understood in opposition to a 'doer', someone who works with

reality, someone who can put a certain theory, vision or concept into practice. That is not to say that intellectuals never implement their pursuits or that ‘doers’ do not think and go the extra step to diffuse their (or others’) concepts and ideas.

Table 1 Synthesis of selected modern architects, their visions and America’s utopias

Generation	Architects and their visions*	America’s utopias**
First	Frank Lloyd Wright (1867–1959): The Broadacre City Le Corbusier (1887–1965): <i>Le Ville Radieuse</i> Buckminster Fuller (1895–1983): The Dymaxion	The Family Farm
Second	Catherine Bauer Wurster (1905–1964): Public Housing Oscar Niemeyer (1907–2012): Brazil’s New Capital Constantine Doxiadis (1913–1975): <i>Ecumenopolis</i>	The American Suburb
Third	Paolo Soleri (1919–2013): Arcology (Arcosanti) Denise Scott Brown (1936–): Iconography Christopher Alexander (1936–): Pattern Language	The Sustainable City-Region

*Adapted from Drew (1972); ** Adapted from Vance (1994).

In fact, cities are shaped by both, urban intellectuals and doers. Although the actions of doers can be more spatially visible, intellectuals’ theories and visions can potentially reach multiple urban actors and influence their worldviews, decision-making rationales, and even daily routines. In certain cases, urban intellectuals have great political influence; some of their ideas are used to legitimize (or oppose) public interventions in cities and, in certain cases, also in nations. Many critical public decisions at various levels of intervention are made based on the expert opinions of intellectuals; and in certain occasions, large amounts of funding are diverted to specific projects that would not be funded otherwise.

The first generation of architects depicted in Table 1. shows the master architects of the modernist movement; architects who have been unconditionally recognized for their pioneering role in influencing modernism. Despite Wright’s individual contributions to this architectonic style, he also designed and fostered a more organic architectonic style called ‘prairie architecture’,

mostly in the Midwest region of the U.S. In addition, Wright also had a practice and apprenticeship school in Scottsdale, Arizona called Taliesin West. Le Corbusier's contribution to modernism is rather well-known and very international in scope with proposals and plans in Paris (France), New York City (U.S.) and Chandigarh (India).

Le Corbusier's *Plan Voisin* (1925) for Paris is an example of a large-scale urban redevelopment plan for a major European city. The expression '*une maison est une machine-à-habiter*' is attributed to Le Corbusier, most likely as a way to capture the functionalist thinking typical of the modern mass production machine age (see Le Corbusier 1927). Le Corbusier's 'tower in the park' paradigm was central to his professional philosophy, which reflected the need to take advantage of new technological advances in construction (e.g. steel frame), land use (e.g. Euclidian zoning) and mobility (e.g. the automobile). Buckminster Fuller became known for his attempts at designing an automobile with some of the characteristics of an airplane, and also later on for devising a pre-fabricated house and various structures made out of lightweight plastic with the form of a tetrahedron (i.e. a triangular pyramid).

The second generation of modern architects dealt with some of the problems unaddressed (and in certain cases overlooked) by the first-generation master architects. This categorization updates Drew's (1972) in order to include a woman, Catherine Bauer Wurster, who was a champion for public housing¹, and a Latin American architect, Oscar Niemeyer, who encapsulated the main tenets of the modernism movement in South America, especially in Brazil. Catherine Bauer Wurster was recognized by the American Institute of Certified Planners (AICP) as a planning pioneer (Birch 1994). Although she had only received limited training in architecture during her

¹ On the vein of a first-generation social activist, Chicago's Jane Addams (1860–1935) and followed by a neighbourhood advocate, New York City's Jane Jacobs (1916-2006).

undergraduate studies (one year at Cornell University), she wrote and advocated for low cost housing, the dangers of suburbanization and urban renewal, and various social planning themes. Oscar Niemeyer, on the other hand, occupied a preeminent position in architecture and urbanism in Brazil, especially in the planning and design of Brazil's new federal capital in the 1950s, together with Lúcio Costa (Stierli 2013). Constantine Doxiadis was a Greek architect who devised his own theory called '*Ekistics*' and a vision of the urban future known as '*Ecumenopolis*'. Doxiadis argument was that future global urban development still needed the existence of small cities in order to anchor connected and continuous urban territories.

The third generation of modern architects has been synthesized as having privileged the social role of architecture, the flexible condition of the work understood as an open system, the relation to social context and environmental issues, the intensification of the relationship with the past and the will to expression above function (Giedion 1965; Dean, Chua and Robinson 2002). Once again, Drew's (1972) categorization was modified to include the main architect of this study, an overlooked Italian-born architect, artist and philosopher who practiced mostly in the southwest, Paolo Soleri; and a woman, Denise Scott Brown, who has had a joint architectural practice with her husband, the 1991 Pritzker Architecture Prize Laureate, Robert Venturi (see Venturi, Brown and Izenour 1996). Finally, Christopher Alexander was part of Drew's original genealogy and is known for decoding and conceptualizing urbanistic principles according to his *opus magnum* books *A Pattern Language* and *The Timeless Way of Building*.

Paolo Soleri, born and raised in Turin during the inter-war period (Mozzati 2000), was likely to have developed his foundational ideas about architecture and urbanism by being exposed to the traditional pre-World War II European compact city (Figure 2). This article attempts to shed light on the work of Paolo Soleri who was not originally included in Drew's genealogy but who has

received increased attention for his arcology proposals and Arcosanti urban laboratory community in northern Arizona during the 1970s and 1980s, especially after the publication of Drew's book in 1972.

'insert figure 2 here'

2.2 America's Utopias

Utopian ideations have emerged sporadically since antiquity in reaction to the specific socio-economic conditions of various eras (Levitas 1990; Pinder 2002). The five-hundred-year-old Thomas More's Utopia is perhaps one of the most well-known and discussed utopias in history. Its anniversary was celebrated recently with symposia, colloquia and the edition of tomes to mark the occasion. According to Nascimento (2017, 7), utopia means 'non-place' and it emerges as 'an extension of whoever inhabits it, [since] the place we were randomly endowed with does not possess enough space to shelter us in our whole dimension.' On the other hand, Vieira (2017, 19) argues that the modes of thinking framed by utopian discursivity enable us to 'organize our reflections on the possibilities for the development of our society, [constituting also] the tools we need to construct a better future.'

Ebenezer Howard's Garden City model is perhaps one of the most well-known and studied visions of the ideal urban community. Its development took place in England and distinct iterations were eventually readopted and built in England and north-America (Fishman 1994). I argue that most urban utopias have the following elements in common: Vision, leadership, critical mass, resources, and a propensity toward effective (i.e. partial and incremental, if not comprehensive and expeditious) dissemination and implementation.

Pre-modern utopian agglomerations included native-American mounds and various types of settlements, of which the Hohokam's villages in the Sonoran Desert, the Montezuma castle cliff

dwellings in northern Arizona, and the Taos Pueblo near Santa Fé, New Mexico are representative cases. In fact, the most common type of pre-Columbian native-American agglomeration was either on top of a mesa, to protect against attack and invasion or on cliff and hill sides. Although agglomerations on valley bottoms were not very common, the Hohokam Tribe built a whole civilization with homes and irrigation canals in the Sonoran Desert, present day Phoenix. Vestiges of the urban agglomeration can still be found in the Pueblo Grande Museum and Archaeological Park, located adjacent to Sky Harbor International Airport.

According to Vance (1994), the first and second American Utopias were the Family Farm and the American Suburb, respectively. This author ventures to argue that the America's third utopia is the continuous search for the sustainable city-region in the context of the Anthropocene and climate change threats (Newman, Beatley and Boyer 2017). The family farm was initially the product of subsistence agriculture and later on a form of advanced industrial production. The freedom from any traces of vestigial European feudalism together with freestanding family farms, independent of settlement types comprised the main characteristics of America's first utopia.

The American suburb emerged as a reaction to the progressive deterioration of living conditions in urban centres and a Jeffersonian tradition, which tended to privilege ruralness and homesteading as opposed to city living. The American geographically detached suburb represented the prototype of America's second utopian reality, based not on architectonic or urbanistic visions of the ideal city (Scully 1988), but on geographical and locational characteristics. The family farm and the ownership of land in the countryside enabled the flourishing of spacious suburbs in the United States, initially for quality of life reasons by the families and households with higher incomes, and later to escape the negative externalities (e.g. air and water pollution and contamination) of the industrial revolution.

Finally, the sustainable city-region represents the ideal goal for the future evolution of expansive regional agglomerations, mostly around important mid-size and large cities in north-America (Calthorpe and Fulton 2001; Platt 2006). Within this context, Banerjee (2014, 381) has alerted us to the need to review ‘the legacy of important thinkers and thinking about sustainability in the literature of architecture, landscape architecture and urban design.’ And I argue that Soleri is an important understudied contributor to that legacy. Furthermore, Lempert (2014, p.223) has advocated for a ‘constructive return to alternative models of human and social development based on realistic assumptions, human hopes, and measures of progress.’ Although some may find it difficult to read these three-distinct socio-economic, geographic and sustainability utopias in the context of the pre-determined modernist generations (i.e. the American suburb, the family farm, and the sustainable city-region); they constitute unique and quite distinct developmental and sequential paradigms, emblematic of territorial development in the U.S. during approximately the last century and a half or so, if not more.

3. Arizona – A State of Utopias

It is a given fact that the untamed desert environment is not very conducive to continued human habitation. The reclamation of the Sonoran Desert lands was only possible due to the construction of an intricate water system in the early 1900s designed to channel water from the Colorado River to the growing metropolis of Phoenix. As stated above, the pre-Columbian human presence in the Sonoran Desert dates back to the Hohokam Indian tribe. In order to withstand the climatic rigors of the region, the Hohokam people had already built a system of canals aimed at directing water toward the cultivation of arable land and also to meet the drinking needs of the population. Centuries later, the migratory movement westward by settlers in the late 1800s and early 1900s

stepped upon the fertile soils on the banks of the Salt River leading to the growth of what would become decades later the Phoenix metropolitan area (Schipper 2008).

If some of the urbanization and architecture in the desert has been adapted to desert living, urban visionaries have conceptualized ideal communities aimed at taking advantage of local conditions and enabling long-term settlements. Most of the urbanized areas in Arizona, and especially the state's capital city of Phoenix, have resulted from subdividing land and building master planned communities. These planned unit developments have been built with single family homes easily accessible and made possible by a mostly flat topography and an orthogonal gridiron roadway system. It is argued that at least three distinct ideal communities have been proposed and materialized to various extents in Arizona: Frank Lloyd Wright's Broadacre City (1932); Soleri's Arcosanti (1970); and Biosphere II (1987).

Frank Lloyd Wright's Broadacre City was a way to accommodate growth in ever expanding suburban settings by subdividing land and urbanizing it with housing and various types of equipment and infrastructure (Grescoe 2012). This land development model was partially adopted in multiple subdivisions and master planned communities throughout the southwest region of the United States and it may have reached its pinnacle in the large retirement community of Sun City in the town of Maricopa (Gober 1985). Wright's ideal city was not based on Le Corbusier's residential mid-rise towers but on horizontal single-family massified suburban development crisscrossed by highways and a roadway system superimposed on the land. The machine age has been literally marked by the automobile and the *homo suburbiensis* in reference to the junction of *homo economicus* and where, until quite recently such person preferred to reside – the suburbs of the temperate-arid southwest region of the U.S. (Bruegmann 2005).

Paolo Soleri's utopian community of Arcosanti is an urban laboratory of an ideal community, perhaps the architect's own oasis relatively far away from the sprawling developments of Phoenix. Arcosanti was built according to sound ecological principles aimed at reducing human footprint, land and energy consumption, and to enable its resident population to be self-sufficient, given the possibility of cultivating arable land on the low-lying agricultural parcels of the property – a micro watershed (Munro and Grierson 2018). Arcosanti received much attention during its initial construction phase in the 1970s and early 1980s. However, since that time Arcosanti has been a work in progress evolving at a more moderate pace, with a relatively small number of permanent residents doing multiple jobs ranging from construction, to a metal foundry and agriculture.

Biosphere II is a scientific experiment aimed at replicating various natural environments within the enclosed space of an artificial megastructure near Tucson, Arizona. The end goals of the various experiments have been to test the human survivability in a completely hermetically sealed artificial environment (Luke 1997). Some of the experiments were aimed at satisfying space exploration' desires for sufficiency and autonomy. The nature of this utopia is more of a commercial investment in scientific experiments than the two other ideal cities introduced above. Therefore, Biosphere II has evolved not with the end goal of creating a vision that could be disseminated elsewhere in north-America, but of a place of experimentation, which lately has also become a tourism attraction for visitors interested in what the Tucson metropolitan area has to offer (Prytherch 2002).

These three Arizona utopias of sorts have been shaped by different visions, leadership, critical mass, resources, and propensities toward effective dissemination and implementation. They have in common the fact that they were partially implemented in a state with harsh climatic conditions during the summer months, a high scarcity of water and arable land. These visions were partial

bold gestures (e.g. oases) in the desert. Other small utopian communities have also emerged throughout the world, including Auroville in Tamil Nadu in southern India, and Christiania in Copenhagen Denmark (Miles 2008), to mention only two. Soleri's Arcosanti has some commonalities with both Auroville, in terms of its urbanistic vision and pursuit of autonomy and self-sufficiency, and with Christiania, in terms of its end goals of having a permanent resident population managing itself through self-governing rules and with multiple spaces ranging from homes, work, offices and recreation places for its residents.

4. Paolo Soleri: A Doer Urban Visionary

This section analyses Soleri's contributions to the field of utopianism; therefore, it is threefold: (1) Soleri as a doer urban visionary, (2) Soleri's main contributions to the field of urbanism (i.e. ideas, concepts and main claims); and (3) Soleri's unique aspects and takeaway thoughts from his vision and applied teachings.

Soleri was simultaneously an intellectual and a doer urban visionary. He applied social science, architecture and artistic principles to synthesize, interpret and problematize reality and then idealized and built prototypes of his ideal visions. And he did so in a very self-sustaining way without compromising his vision with financial interests, in order to increase the viability of his proposals. Soleri was a doer urban visionary because of his capability to envision a better city through his own physical designs and his ability to create the means necessary to complete it.

Soleri obtained his architecture degree at Torino Polytechnic Institute before traveling to the United States to do an apprenticeship with Frank Lloyd Wright at Taliesin West in 1946. The Arizona desert was likely to have enabled the young architect to experience *in loco* the growing

suburbanization of Phoenix, while also helping him to realize how alien such landscape would have looked compared to his architectonic references from northern Italy.

After a brief stint in Italy from 1949 to 1954, during which Soleri did a commissioned work for a new ceramics factory in southern Italy, he returned to Arizona where he settled permanently with his wife. He established Cosanti (i.e. 'cosa' and 'anti,' which together mean 'before (or against) things') – a nonprofit educational foundation and the family living and working compound in the Phoenix' suburb of Paradise Valley. At Cosanti, Soleri experimented with silt construction, which involved making soil mounds, pouring concrete on top, letting it dry and then removing the soil from below, ending up with a resistant roofed structure. In 1970 he started building his applied ideal community of Arcosanti. In between he engaged in artistic pursuits, the design of his arcology structures, lecturing at Arizona State University and exhibiting his designs and models at national galleries throughout the country.

Soleri's main contributions to the field of urbanism included notable proposals in the field of arcology, architecture, philosophy and applied utopian visioning. Soleri's most important books include *City in the Image of Man* (1969), *The Bridge Between Matter & Spirit is Matter Becoming Spirit* (1973), and *The Omega Seed – An Eschatology Hypothesis* (1981). Soleri's first book catapulted him to the public eye with a whole array of very futuristic arcology mega-structures, giving rise to travel exhibits to art galleries in Washington D.C. and New York City. The second book was a collection of essays written over a period of about eleven years on various aspects of society, urbanism, and ecology. Finally, in his third book published in 1981, Soleri elaborated on the work of the Jesuit *Teilhard de Chardin*, while also developing his own philosophical ideas on religion as simulation, space and man, relative poverty and frugality, sacred spaces and the role of technology.

One of Soleri's most important concepts was that of arcology, which contemplated the joint study and development of architecture and ecology. The direct result of his arcology research interests comprised high density, fantastically unreal megastructures for several million residents. This was initially proposed through a program presented in his pioneering 1969 book '*City in the Image of Man*'. The distinguishing characteristic of his design program was twofold: First, the identification and characterization of the problem, which included the conceptualization of the main dilemma framed in terms of the excessive problems associated with the expansive land consumptive and automobile dependent practices of the southwest, and a portfolio of 30 megastructure designs. Part one was replete with diagrams to help convey his most important concepts. The detailed systematization of ideas and proposed solutions was equally quite impressive. The 30 futuristic designs in part two of the book comprise mostly megastructures with such suggestive names such as Novanoah, Babel, Arcodiga, Hexahedron and Arcosanti. Soleri's work benefited greatly from added visibility created by traveling exhibits outside of Arizona. Some of his megastructures were even adapted to science fiction films, such as Stanley Kubrick's '2001 A Space Odyssey'.

Soleri's most important ideas are subsumed in the architect's:

- two suns arcology designs,
- in his urban effect theory consisting of MCD: Miniaturization, Complexity, and Duration,
- positionings on frugality and opposition to the mass consumption tendencies in American society in the period after World War II,
- experimentation, and
- applied teaching and learning at Arcosanti.

Most of Soleri's ideas represented breaks with the dominant vision and established order of his time because he privileged a hill side location adjacent to a valley, instead of simply taking advantage of the flat topography prevalent in the Phoenix metropolitan area, where mainstream urban development was already occurring at a very rapid pace. In addition, Soleri also designed and built apse-shaped structures with a southern orientation to capture solar exposure, and a preference car-free urban development (Crawford 2000). Soleri was also able to influence urbanism theory and practice through his applied five-week teaching workshops in Arcosanti.

Some of Soleri's takeaway thoughts from his vision and applied teachings can be identified in many contemporary sustainable urbanism practices (Wheeler 2013). For instance, arcology ideas are now best practices aimed at strengthening built urban form and encouraging energy conservation, walkable environments and self-sufficiency. The built urban form is relatively high density with various complementary buildings and housing typologies. Energy conservancy practices contemplate solar exposure, ventilation and the utilization of stone in construction in order to preserve the conducive and thermic characteristics of materials. Many of these best practices, have been codified in biophilia laws (see Brown 2016).

Thought 1: respect for environmental conditions synthesized in various biophilic laws.

Car-free walkable environments were created by design specifically to preclude the need to utilize automobiles in ideal communities. Finally, economic self-sufficiency was to be accomplished by the reinvestment of profits in the expansion of Soleri's urban laboratory of Arcosanti. Furthermore, Paolo Soleri's foresight and philosophy also anticipated, if not propelled many sustainable urbanism innovations throughout the united states and even the world. Ecological advancements in sustainable urbanism have occurred since Soleri first conceptualized

them (Cook 1991; Portney 2002; Farr 2008; Pizarro 2016). It is possible to find sustainable urbanism principles and best practices, which developed in tandem with Soleri's visions without much attribution to the source, such as LEED ND (neighbourhood development), sustainability metrics and interventions, and even certain elements of neo-traditional urbanism can be traced back to attempts at creating more ecological, efficient and just communities (Spirn 1985). Soleri's ideas have spread mostly via exhibits, published books and documentaries, workshops with the participation of students from throughout the world, tourism visits to both Cosanti and Arcosanti, events at Arcosanti, and the sale of locally designed and locally-made wind-bells (Doğan 2019). It is important to still recognize that some of Soleri's ideas might have been inhibited by the master architect's vision, zealous control of the various phases of the development, and a certain inability or unwillingness to obtain additional private and public support.

5. Arcosanti

Arcosanti is one of the three largest conceptual cities based on arcologies designed by Paolo Soleri, the other two being: Mesa City and Macro-Cosanti. It is important to refer that Soleri did not consider Arcosanti a utopia, but an urban laboratory instead. Located in Mayer, Arizona, the whole site occupies an area of more than 2 square kilometre, of which the building footprints occupy only just a tiny fraction. Arcosanti's started being built in 1970, and, almost 50 years later, its construction remains unfinished as I write this paper in Spring 2018. The urban laboratory consists of an alternative urban planning model. One of its main goals was to demonstrate the power of interaction and accessibility associated with an urban environment. The location of the property is quite far from any urban centres; the site of the development is on top of a mesa with some of the built-up structures overlooking the hillside; the model itself was based on an idealized

megastructure, while the construction process was mostly the result of self-construction by Soleri, his students and volunteers. Because of all these various characteristics, Arcosanti might be perceived as a very radical form of urbanism in north America (Brown 2016).

The design incorporates foundry and ceramics apses aimed at maximizing energy conservation and accomplishing ideal climatic conditions (Figures 3 & 4). Arcosanti's designs aim to reduce the amount of land devoted to the built-up structures and to conserve energy and waste, while promoting a healthy symbiosis with the surrounding natural environment. The various buildings in Arcosanti have been designed to potentiate the 'urban effect' envisioned by the laboratory's architect. With the exception of the camp at the base of the hill, all other structures have been built to create beautiful vistas of the Agua Fria valley down below and the nature preserve across from the community. Arcosanti's urban form is dominated by the apse structures reflecting Soleri's arcology concept. However, the remaining structures were designed to augment the architect's ecological-urbanistic vision. Arcosanti's buildings include a five-story visitors' centre with common services, a bakery, a café, and housing for staff, the apses, residents' and guests housing, the vaults, the Colly Soleri Music Center, offices and the library and archives. A small hotel and swimming pool on the hill side was built more recently.

'insert figures 3 & 4 here'

Arcosanti was thought out to accommodate a resident population of about 5 thousand people. However, the resident population has been very small (about 200 individuals at a time). Arcosanti is visited by approximately 40 thousand to 70 thousand tourists per year. At any one time, Arcosanti has two types of residents: permanent and transitory. The permanent residents consist of mostly staff and residents who have been living in Arcosanti for a number of years. Students

enrolled in workshops and volunteers who have committed themselves to staying in Arcosanti for a limited amount of time comprise most of the transient population.

Some of the main criticisms voiced against Arcosanti are: Its remote location; the difficulty in maintaining the community autonomous from the surrounding region in terms of energy and food; the small revenue stream, mostly from the sale of wind bells to continue the construction works; and, the relatively low number of participants in the workshops and at some of the events (Luke 1999).

This last shortcoming has been partly offset with a partnership agreement between Strathclyde University in Glasgow and the Cosanti Foundation to enable masters students from throughout the world to do some of their applied work at Arcosanti as part of their masters of architecture and sustainable engineering. Finally, one of the latest visions to emanate from Soleri's urbanistic and philosophical approach was a 'Lean Alternative' solution (Soleri et al. 2012; Soleri 2013) aimed at fostering interest in a linear type of arcology to be deployed in developing regions of the world. To a certain extent, this is the continuation of the same arcology ideal community vision centred on the design principles prototyped at both Cosanti and Arcosanti.

Thought 2: suggested urban form without dictating rigid pre-determined architectonic structures.

6. Paradoxical Interpretation of America's Third Utopia

It is important to note that Soleri invoked Constantine Doxiadis's *Ecumenopolis* claim on nature's disappearance due to urbanization's engulfing much of the United States territory in the introduction of his 1969 'City in the Image of Man'. He designed Arcosanti as a localized inspirational vision of what an ideal city could be. Vance (1994) has identified two utopias in

America: The family farm and the American suburb. Soleri's vision is the opposite of the American suburb, and therefore it is not a reformulation or a repackaging of suburbia, but a completely distinct set of ideals and applications. The almost omnipresence of the suburbs throughout the country and the rarity of Soleri's applied principles stand in stark contrast to each other. This leads us now to an attempt at answering this article's three research questions.

6.1 A Utopian Vision Based on Arcology and Frugality

An old motto says aphoristically that 'even dead fish can go with the flow'. Soleri went against the flow of dominant suburbanization, motorization, mass construction and mass consumption in America. His motivations might have resulted from alternative conceptualizations of reality and a distinct understanding of how to live one's life without having to compromise one's own core values and beliefs. His European upbringings may have also shaped his urbanistic conception. Soleri's vision and modes of accomplishing such ideal vision (arcology and frugality) might have benefited from his interactions with Frank Lloyd Wright at the beginning of his career. Nonetheless, his chosen path was radically different, even if the apprentice model of transmitting knowledge might have been relatively similar. As introduced above, we can also inquire about any commonalities between Arcosanti and the somewhat similar initiatives of Auroville and Christiania. Contrarily to Auroville, Arcosanti's genesis was not based on 'the mother' figure, an inspiring representation and symbol of fecundity and fertility, but on a male master architect who encapsulated a belief in the creative potential of the human being. And contrarily to Christiania, Arcosanti is outside of a consolidated urban area and was planned as an ideal community, not one which was appropriated and reclaimed by a group of individuals.

6.2 Urbanistic Memes – An Americanized Mixed-Bag?

Soleri prepared various designs for bridges in the 1950s and later on in the 2000s. The first unbuilt bridge at the beginning of his career enabled him to move forward into an unknown realm of possibilities. The second bridge, was built in downtown Scottsdale and serves to celebrate the architect's accomplishments, to connect everyone who sees it to his vision and noteworthy messages, and also to help perpetuate the architect's memory. The bridge designs are metaphorical examples of memes (Dawkins 2016) and how memes help propagate visionary ideas. Soleri immigrated to the US with a certain meme pool (e.g. the European frugal model city, a preference for compact and walkable environments, the urban effect, and an energy efficient city), he did not discard of those memes and during his residence in Arizona he certainly gained many other memes (e.g. apprenticeship with Wright; an appreciation for organic architecture; respect for the desert environment; conscientious consumption of scarce materials, such as water and energy; complexification of reality and the need for simplification and miniaturization of certain operations; silt construction and metal foundry; frugal living and self-sufficiency), which then were transmitted to his apprentices from throughout the world at Arcosanti (e.g. arcology, work ethic and discipline, communionship in the Arcosanti vision and philosophy). Subsequently, Soleri's students then took those messages with them back to their places of origin (see Brody 2016; Mossberger and Wolman 2003).

<p>Thought 3: aim for social sustainability relationships that enable life, liberty and the pursuit of happiness.</p>
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6.3 Realizable Utopia – The Perpetuation of Sustainability Goals

Soleri provided us with quite a strong example of a realizable ideal community: Arcosanti. Arcosanti is one of 30 arcologies Soleri and his students designed and modelled mostly from the 1960s through the early 1980s (Figure 5). From his vision and principles, we can establish links to other regional settings, other arcologies, and biophilic and sustainable urbanism knowledge and operative principles (Register 2006). If we look carefully, we can also realize that some of those ecological principles can be found in a limited number of communities in Phoenix, such as Anthem in North-Phoenix, Verrado in Buckeye, and Agritopia in Gilbert, to mention only a few. Perhaps, the main difference between these neotraditional communities and Arcosanti is the market-led and market satisfaction of the former and the assertive conviction in favour of self-construction, social and environmental sustainability, and self-sufficiency of the latter. Nonetheless, all these communities share community centres, co-working spaces, and collective play areas (e.g., tennis courts, swimming pools, spa) that enable residents to fulfil multiple social needs of conviviality, social interaction, and use of common facilities and equipment by themselves and their guests.

Thought 4: the perpetuation of sustainability goals through opportunities for self-realization and actualization within multi-scalar community relations.

‘insert figure 5 here’

One can also question whether there are any fundamental differences between Arcology and the earlier utopias of for instance the family farm or the American suburb? Arcosanti’s rebel and alternative orientation in opposition to mainstream societal tendencies, its emphasis on not only demonstrative potential but also active participation in the planning, design and construction of the vision, and the fact that Arcosanti has not had any major commercial or speculative self-serving interests may be some of the main answers to the above question (Zelov and Cousineou 2000). The current CEO of the Cosanti Foundation, Mr. Jeff Stein has been traveling regularly lecturing

and diffusing the arcology message to new publics. Professor David Grierson from Strathclyde University in Glasgow, Scotland, has organized arcology symposia and even a study abroad program in Arcosanti (Grierson 2016). Moreover, Doğan (2019, p.371) has recently discovered that eco-villages such as Arcosanti attract a high number of visitors and have a ‘significant potential for sustainable tourism.’

Soleri’s ideas have also been widely disseminated in Italy due to his early upbringings and the work of Professor Yolanda Lima, who wrote perhaps the architect’s most complete biography (2013). We know that China is also investing heavily on eco-cities and that Soleri and his team wrote a very comprehensive book on the lean linear arcology strategy (Soleri 2013). Broad and ambitious environmental goals are also being pursued in Abu Dhabi with the design and construction of a zero-carbon emissions city called ‘Masdar City’ (Randeree and Ahmed 2019). Finally, the Arcosanti alumni network of students and everyone else who has ever interacted with Soleri in the context of visionary communities throughout the world constitute an army of potential advocates for Paolo Soleri’s ideas and the potential realization of America’s third utopia: The sustainable city-region of the future.

7. Conclusions

In conclusion, ‘utopianism permeates both radical and reformist environmentalism’ (Pepper, 2005, p.3). The myth of America’s third utopia centred on a sustainable city-region has been variously embraced by some of Soleri’s predecessors and even some of his contemporaneous. Among the former, we find Ebenezer Howard’s magnet diagram of town and country living and the happy symbiosis of both dimensions of development. Buckminster Fuller and Constantine Doxiadis have also proposed innovative solutions to old and complex urban problems of co-

existence and respect for a city's fragile ecosystems and its hinterlands. Among the latter intellectuals, we find a relatively long lineage of individuals and practitioners of whom Ian McHarg (2005), Richard Register (2006), Douglas Farr (2008), Mike Davis (2010), Peter Calthorpe (2011), Saskia Sassen (2014), David Orr (2016), and Frederick Steiner (2016) are just some of the most innovative ecological urbanism thinkers. Even some of the latest generation new urbanism developments in many parts of the U.S., which have emerged out of the work of Andrey Duany and Elizabeth Plater-Zyberg, could be considered north American versions of European-based old arcology thinking and urbanistic interventions (Duany, Plater-Zyberk and Speck 2010; Duany and Talen 2013).

Arcology's perceived weaknesses of self-funded, self-built, and self-perpetuating features may turn out to have been some of Soleri's greatest contributions to American urbanization processes, in spite of the inherent value of his initial megastructure designs. Furthermore, Zelov and Cousineou (2000) in *Design Outlaws on the Ecological Frontier* make the case for other alternative urbanistic models, as does Carlsson (2008) by continuing and expanding upon some of those same themes in *Nowtopia – How Pirate Programmers, Outlaw Bicyclists, and Vacant-Lot Gardeners Are Inventing the Future Today*. Ultimately, a utopia is 'an affective process, wherein the imagining of utopia is actualized in everyday practice (...), a lived experience in which people challenge hegemonic discourses and systematic oppression.' (Jones 2015, p.213).

Even almost five years after Soleri's passing (Bernstein 2013), the charismatic architect's work is still being featured in Arizona and his creative way of financing Arcosanti's development through the sale of art pieces is still taking place. *The Scottsdale Museum of Modern Art* just had a third brand new exhibit of Soleri's designs and contributions to the field of American urbanism at the end of 2017. Although Soleri's vision will likely continue to evolve in Arizona, his ideas

have already permeated and are likely to acquire new forms as they are re-appropriated by new generations of visionaries in north America and beyond (Sandercock 2002; 2003).

In summary, the concluding thoughts are fourfold:

- respect for environmental conditions synthesized in various biophilic laws;
- suggested urban form without dictating rigid pre-determined architectonic structures;
- aim for social sustainability relationships that enable life, liberty and the pursuit of happiness;
- and, the perpetuation of sustainability goals through opportunities for self-realization and actualization within multi-scalar community relations.

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