On the Prospects of Inverse Arcology

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Logos ✦Press

The object is eternal, only the subject dies.

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Introduction

Who is this brain-dead worm, this mad cadaver, this "modern" American architect? Not nearly modern enough, his works swim amidst a phantasmal tide and lags behind decades, or, if he or she wishes to showcase their cultural acumen, centuries! How little has changed since the times of Sant'Elia and how right he was! All around America one spies these ugly conglomerations of brick and fake wood, roman columns affixed to cement facades, as if in afterthought. Ugly, insipid and wasteful; it is the latter which leads so oft to the former eventualities. Those materials which have been hitherto plied to fashion those many layers of superfluous paneling, column-fitting and ostentatious, gaudy nonsense on our buildings could have been aggregated to create whole new living spaces and the pathways to them! Fear not, we shall dispatch of these cretins in goodly time.

However, it is never enough to merely criticize; a solely negatory enterprise invariably consumes itself at the last. Instead we will pair our rebarbative salvos with a proposal, not just for a new style or aesthetic of American architecture, but an all-encompassing vector for societal construction. Be not uncertain, this task is of no small import, but rather, one of the greatest possible magnitude. The total world population is projected to increase markedly by 2050, whilst the concentrations of individuals living in urban areas are projected to continue intensifying. As of 2010, over 50 percent of the world population lived in urban areas. According to United Nations, China's population is projected to reach 900 million by 2030, India, approximately 700 million and the USA, just under 300 million[1]. One then spies numerous problems arises, ranging from resource scarcity from over-consumption to hyper-compression and traffic congestion. To effectively meet this challenge new societal models will be required. One of the most interesting of these new ideas was laid out by the Italian architect, Paolo Soleri, in his 1969 book, *Arcology: The City in the Image of Man*. Soleri lays out the foundations of *Arcology*[2] as both a new type of societal structure and a new way of thinking about man's relationship to the world. He wrote:

"Such a structure [an Arcology] would take the place of the natural landscape inasmuch as it would constitute the new topography to be dealt with. This man-made topography would differ from the natural topography in the following ways: It would not be a one-surface configuration but a multilevel one. It would be conceived in such a way as to be the carrier of all the elements that make the physical life of the city possible—places and inlets for people, freight, water, power, climate, telephone; places and outlets for people, freight, waste, mail, products, and so forth. It would be a large-dimensioned sheltering device, fractioning three-dimensional space in large and small subspaces, making its own weather and its own cityscape. It would be the major vessel for massive flow of people and things within and toward the outside of the city. It would be the organizing pattern and anchorage for private and public institutions of the city. It would be the focal structure for the complex and ever-changing life of the city. It would be the unmistakable expression of man the maker and the creator. It would be diverse and singular in all of its realizations. Arcology would be surrounded by an uncluttered, open landscape (Soleri, 1969, p. 13)."

1 United Nations, World Prospects, 2007 revision.

2 Arcology is a portmanteau of “architecture” and architecture.” See, Soleri, Paolo (1973), *The Bridge Between Matter & Spirit is Matter Becoming Spirit.*

To construct his soaring vision, Soleri borrows from the work of Pierre Teilhard de Chardin's Omega-Point hypothesis[3]. Due this influence, Soleri conceives of arcologies as places, not just of new-found frugality, protection and efficacy, but also of spiritual improvement. Soleri further sketches out the details of his new habitational paradigm by way of CDM (Complexity, Miniaturization, Duration), three guidelines which all arcologies must obey to be commensurate with the rhythms of human life. Soleri takes the issue of energy consumption seriously and posites that arcologies, to be properly constituted, must be energy-cities, that is system-structures which, in their entirety, work to produce, capture, store and utilize energy. Additionally, Soleri tackles the issue of *density*, the synthesis of CDM, that is, miniaturization within a complex system over a period of time; as Jeff Stein noted, "No Eco-thinking can ignore density. *Crowding*, the maker of life."[4]

Some concrete examples of arcologies which Soleri sketched (though these were, obviously, never built) included, *Novanoah II* (1969), a massive construct which could comfortably occupy 2,400,000 inhabitants upon the open oceans, and, *Stonebow* (1977), a gargantuan arch designed to be situated over canyon topographies, as well as, *Arcbeam Variation* (1977), a giant multi-layered bridge-like structure designed to be situated between two cliffs or mountains. Whilst a cursory viewing of his conceptual sketches and reading of his theories might lead one to believe he is some sort of jelly-minded Utopian, he is nothing of the sort. During a 2008 interview between Soleri and *The Guardian* reporter, Steve Rose, the journalist inquires as to the feasibility of creating a "utopia" without money to which the architect responded, "Utopia is a pretty stupid notion."[5]

It strikes me as rather odd that Mr. Rose would make such a inquiry given that he conducted his interview in the *Arcosanti*, a arcological city designed as a alternative to the traditional American urban sprawl by none other than Soleri himself! Now, it bears noting, that the *Arcosanti* even now, as of this writing in 2018, is not yet completed, but the fact that it exists at all, attests to the immediate practicability of, at least some, his designs.

Thus far we have established three points of import: Firstly, we have established what arcologies are, secondly, we have established that arcologies are required for the future development of technologically advanced peoples due to urban concentration, and, thirdly, we have established arcologies are, at least in some of their variations, immediately viable. However, the uniqueness of particular nations, countries and empires bears factoring into this tripartie equation; one cannot merely say, ecologies should be built, or, ecologies need to be built, and simply leave it at that. We must tackle the *specific kinds* of ecologies which should be built and, additionally, address, precisely *why* and *how* they should be built. Soleri's *Arcosanti*, for instance, was created specifically for Americans as a reaction to the cloistering penchants of modern urban architecture. Hence, Soleri, like all good architects, took both the question of topography and identity into consideration; the topography of the land, the identity of the people who will prospectively occupy the structure and, finally, the identity of the prospective architecture itself to ensure that it is commensurate with those who will there taken up residence.

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3 The Omega-Point is the belief that all things in existence are destined to move towards the creation of a superintelligence born out of the evolutionary process. Chardin's theory is similar to the heat death hypothesis proffered by many physicists and cosmologists, differing in that he believed that the process would operate beyond the strictures of entropy. The idea might best be summarized via Kurzweil, "Evolution moves inexorably toward our conception of God, albeit never reaching this ideal."

4 Jeff Stein, The City 2.0, TEDxMission, Nov. 9th, 2012.

5 Steve Rose, *The Man Who Saw The Future*, (*The Guardian*, 2008).

For our purposes we shall narrow our focus upon prospective Arcological methods for the United States.

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Arcologies, as formulated by Soleri, are generally conceived of as towering megastructures; but let us consider a different formulation, a inverse arcology, one which goes downward instead of up. To build down means to traverse one of two domains: The **earth** and the **waters**.

Chthonic Arcology

Modern architecture already entails a good deal of chthonic burrowing, such as: subways, basements, bunkers, mausoleums, mine-shafts and vaults. To go further and build a habitable domicile is not just practicable, but already a reality. For instance, in Festus, Missouri, a 15,000-square foot home was built inside of a sandstone cavern, dubbed, the *Cave House*. The structure blends seamlessly into the cave walls for both aesthetic appeal and pragmatic effect as geothermal design wholly eliminates the need for additional heating and cooling modules such as air conditioning units or electric or gas heaters. The case of *Cave House,* though not a arcology, is promising given that there is nothing which prohibits those same techniques and materials being utilized towards subterranean city development other than a willingness to take the plunge. Once such a process becomes mainlined then the additional mind-power required to begin fleshing out possible arcological models for underground self-sufficiency (such as thermal capture, deep gardens and watershed exploitation).

Then there is the fantastical underground city known as the Shanghai Tunnels or Portland Underground, in Portland, Oregon, used in the 1850s to the 1940s for the imprisonment and transportation of captured laborers – slaves – to be utilized by unscrupulous seamen in their travels to the Orient (a practiced colloquially referred to as *Shanghaiing*). Women who were captured were, according to legend, typically sold as prostitutes for the enjoyment of libidinous seamen. Though the dense and winding passageways beneath Portland's Chinatown (also known as 'Old Town' or 'Central Downtown Portland') were utilized for rather unsavoury ends, the infrastructure was (or rather, still is) highly sophisticated and even housed various subterranean living quarters, primarily prison cells used to hold the various men and women who were dragged down into the labyrinth. Again, the Portland Underground is not a arcology but given that it shows the answer to the question, “Are modern underground cities feasible?” is an obvious, “Yes,” the question then becomes, “Where then to build and how?” Let us turn our attention to abandoned mines as a prospective domain of conquest.

There are approximately 500,000 unoperational mines in the United States of America, according to Abandoned Mines.gov, a website managed by the Bureau of Land Management. Some place this number higher, given the difficult of mapping hazardous topography and the fact that some mines are so old that documentation concerning them is all but impossible to find. Govenmental statistics from 2014 show 46,000 abandoned mines on public property. Given the fact that so much funding and man-power is already being directed towards modulated these empty husks of former productivity, it stands as imminently reasonable to propose that we go all in on these myriad projects and transmogrify them wholly. Instead of dark and echoing pits, into which, the hapless wayfarer might be plunged, acrological mapping might produce a luminous and bustling cultural hub, or transportation terminus. The Department of the Interior has projected that the Enviromental Protection Agencies empty mine

clean up plan would require approximately 72 billion dollars (2.4 billion dollars from tax payers), and that is only for hard rock mines, meaning, those mines which separate minerals from metals, and does not cover any other mine variants. One might fashion a new and more efficacious plan which lowers the total cost for equipment, manpower, transportation and tailing clean-up and put those saved funds into renovating vibrant living spaces within what would be, even after EPA interference, hollowed out caverns. This plan would be especially useful for those mines which are slated for re-opening as some portion of the arcological space would be able to function for them as a home-away-from-home during their labors and, in time, may even birth whole new cities which would continuously expand themselves as their inhabitants drilled further and further into the earth, chasing the precious metals and minerals therein.

Abyssal Arcology

Let us dispense with any silly notions about the impossibility of underwater cities and let us also cast off our fears of the inherent dangers there implied. Japan's Shimizu Corporation announced, in 2014, plans for a underwater city designed to accommodate 5000 people. The project, entitled, *Ocean Spiral*, was given the green light in 2015 and consisted of blueprints which proposed a series of massive interlinked orbs, 1600 feet in diameter, with exceedingly long screw-like extensions which would burrow into the seabed where they would connect with various modules that would be utilized as outposts for resource collection, such as mining. The spiral surrounding the floating spheres of project *Ocean Spiral* would serve a additional function other than connecting to the seafloor, namely, energy collection. Given the scarcity of power options so deep underneath the ocean, the theorists behind the project realized that the structure would require a built in power-source, thus, the spiral would capture thermal energy from the ocean generated from the difference between the cooler lower seawater and the warmer shallows and then use that captured energy to power steam-turbines within the spiral, a process referred to as Ocean Thermal Energy Conversion (OTEC). Shimizu Corp also believes it is feasible to utilize microorganisms that live upon the seabed to harvest energy by using them to convert carbon dioxide into methane. The question of sustenance is easily answered given the bounty of the sea, though to ensure a goodly supply, fish and crustacean farms and underwater gardens would be built into and around the structures and water would be desalinated via a reverse osmosis membrane from the ocean. Each sphere within the spiral would be able to move up and down at-will and operate like spacious slow-moving submarines with the uppermost sphere acting as the principal residential area.

In a interview with The Guardian in 2014, Shimizu Corp's spokesman, Hideo Imamura stated, “This is a real goal, not a pipe dream. The Astro Boy cartoon character had a mobile phone long before they were actually invented – in the same way, the technology and knowhow we need for this project will become available.”[6]

Thus, we see that not only are inverse arcologies possible, **they are already being designed** (*Ocean Spiral*, for instance, is speculated to be built and prepped for human habitation sometime around 2030).

6 Katharine J. Tobal, *Japan Releases Plans For Futuristic Underwater Cities By 2030*, Nov. 25, 2014.