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The surrealist metamorphosis, prophecy of genetic architectures Alberto T. Estévez, Architect, Director iBAG-UIC Barcelona Judith Urbano, Art Historian, Dean Faculty of Humanities-UIC Barcelona

Abstract. Salvador Dalí was able to prophesy that the architecture of the future would be soft and hairy. Partly, for contradicting Le Corbusier with his rational-functionalism. However, he still did not imagine that years later he would be able to corroborate that prophecy by understanding the potential of genetics and DNA. But he did not have time to see that the potentialities of computing were also going to be able to digitally develop what genetics would do biologically. The Genetic Architectures Research Group, now integrated in the Institute for Biodigital Architecture & Genetics at UIC Barcelona, launched both potentialities as applied research in architecture and design. The surreal landscapes and architectures of different artists (Max Ernst, Yves Tanguy, Salvador Dalí) remain as precursors of such potentialities. Thus, the surrealist creative process itself becomes a path of action for architecture and design, which is generated with biological tools and/or digital tools, and which can be developed today thanks to current advanced technology.

Keywords: Surrealism; Architecture; Design; Surreal Architecture; Metamorphosis; Genetic Architectures; Genetics; Digital; Biodigital Architecture; Digital Organicism.

Introduction (dismembering the title)

Metamorphosis. Transformation of something into something else. The passage from one state to another. The variation of the form of a same being. Or changes in its capabilities, in its functions. And even becoming a different being. But it could also be said that there is metamorphosis throughout someone's subjective perception. When —with or without another's previous intention— the same element is understood with ambiguity, conceptualizing itself along a derivative in a changing way. Assuming all this as a surrealist method of creation. An effective system to conceive new groups that combine originality, surprise, impact, "fear, the felt attraction towards the unusual, the chance", as André Breton would say in the 1924 Surrealism Manifesto (Breton, 2002). At the same time, it generates reflection, with or without aesthetic purposes, which for Surrealism is the less important. Although, is a simply physical metamorphosis more "definitive" than a spiritual one? One that affects only the body or one that upsets the mind, the psyche, the soul? Call it as you want... A proper metamorphosis that happens, whether you seek it or not, whether you suffer it or not, also when facing or perceiving a metamorphosis in others. As a simple virus would do, capable of altering without consciousness or end the

DNA of any living being that will cause its physical metamorphosis. Thus, the human being is capable of doing it now from genetics, as a complex conscious virus, in the reality of nature. Or capable of metamorphosing others metaphysically with its artistic and architectural creations.

Surreal. Inheritance from the Dadaist systems which years before had already repositioned objects found at random, and because of their unexpected proximity, they endowed them with unusual new meanings or they removed the ones they already had. Decontextualizing them as –following Isidor Ducasse– "a fortuitous encounter of a sewing machine and an umbrella on a dissecting table", and this table becomes a new context for them (Duplessis, 1953). Taking this as a new paradigm of the chain of beauty that leads from Metaphysicism and Dadaism to Surrealism. A decontextualization that occurs by extracting them from the space that would be normal for them. Followed by "simple changes of color, scale and context" (Estévez, 2010): especially variations in size and shape, sometimes derived from the adoption of characteristics that are not typical of what is represented.

Something that will accentuate the uniqueness of the encounter, the unrepeatable of the performed moment. At the same time, random as a creative system of new realities, as random are the changes in the DNA of living beings. It is also at random than an *objet trouvé* appears in front of the artist or the architect arousing his interest and attraction, and serves as the basis for his creation. Or he takes at random whatever is in front of him, without any emotionality, a *ready made*, which he will also assemble to achieve the proposed objective.

Prophecy. It is exercised on the distant and future. Oracle, prediction, judgment, which can be emitted at certain, present, vivid signals. Aware of being a prophecy or not. Sometimes as "said in emptiness" (Ins leere gesprochen) as Adolf Loos wrote (Loos, 1921). Knowing that perhaps no one will listen to what you are saying. But also pushed by a certain amount of responsibility to say it. Words that maybe luckily someone will take them up again, years later, as a fulfilled prophecy. Like when Loos himself extended himself a decade later in his second book (Trotzdem): "I am victorious in a thirty-year struggle: I have freed humanity from superfluous ornament (...), thanks to the work of my whole life, (...) and I know that humanity will thank me" (Loos, 1931). And these sentences are cited here because there is an historical parallelism to what is happening now, a century later, speaking about genetic architectures in the current environment of a rational-functionalist academy. Of course, many other prophetic words may remain forever in the dark. Like all possible species of living things that could have been generated if their genetic changes had been different. Like the man-bull (a Minotaure: title of the surreal magazine par excellence), the man-plants, the flower-women (Cirici-Pellicer, 1949).

Genetic architectures. Those that genetic science can already begin to open its doors. It is only a question of will, of funds, of research dedication, in this order (Estévez, 2003). In inverse proportion to the time required to achieve results. We can already think of objects

of use, walls and ceilings that grow alone by its application. In houses, buildings, cities, parks and landscapes, entire territories, even planets that emerge powered by the mere internal force of their DNA. This writing could be called not only "The surrealist metamorphosis, prophecy of genetic architectures", but also "Prophecy of genetic worlds". Entire worlds, genetically designed to solve human needs. Nearby, orbiting around Earth. Or small microcosms, as big as a patio, or as an entire city. No need to go to distant and inhospitable planets with an uncertain future. Meanwhile, on the other hand, Judith Urbano already started to explain the issue of the prolegomena to genetic architectures (Urbano, 2009).

Metamorphosis and a key sentence

Perhaps it is not a coincidence that here in Barcelona, the one of Antoni Gaudí, where Dalí prophesied that "the architecture of the future will be soft and hairy" (Dalí, 1956), the real application of genetics to the architecture begun, with the creation of the first laboratory of real genetic architecture on the planet, with the creation of the first digital production workshop in a Spanish school, with the creation of the first official postgraduate program on these genetic-biodigital topics, Master of Architectures Genetics first, called now Master of Biodigital Architecture.

Certainly, the aforementioned prophecy of Dalí is fulfilled. He knew that it was simply a matter of having the necessary technique, coming from genetics, which took half a century to arrive: "in 1925 I met M. Le Corbusier (...) he asked for my opinion regarding the future of architecture. I replied that I saw it as "soft and hairy." I have not changed my mind and I hope that the technique will catch up with me one day, because I am still ahead of it" (Dalí, 2003). "And I stated categorically that the last great genius of architecture was called Gaudí (...) While listening to me, Le Corbusier seemed to swallow toads and snakes" (Dalí, 2000). "The architecture of the future will be soft and hairy. It is already soft with Gaudí and it will be hairy because of Dalí, and then I will also look at the creative power of Gaudí" (Dalí, 1956).

In short, what Dalí defined is extremely clairvoyant, he remembered it decades later from Gaudí's Park Güell, in Barcelona, in 1956: "the architecture of the future will be soft and hairy". In addition, he also said that he was fascinated by the plasticity of Gaudí's architecture, which led him to speak of "eatable" architecture (Dalí, 1933). More than a surreal boutade, it became a true prophecy. Years later he would continue talking about how the technique was not yet ready for such a future. But that the time would come - he said, as mentioned before - when the technique would reach his words, fascinated as he was by the birth in the 1950s of the very first milestones in genetics. This has been the case when, more than half a century later, the (genetic) technique made it possible, Dalí's dream was achieved. Now it's just a matter of investment in research. The more it is enhanced, the sooner "soft and hairy" and "eatable" architecture will appear, as we have begun to illustrate, define and investigate from Barcelona, organizing an unprecedented interdisciplinary group of architects, geneticists, philosophers, and historians of art and architecture too.

Dalí published the famous article "De la beauté terrifiante et comestible de l'architecture Modern Style" in the surrealist magazine *Minotaure* (Dalí, 1933). But before, on March 22, 1930, he gave a conference at the Ateneu in Barcelona entitled "Moral position of surrealism" (Dalí, 1930), where he already commented on the exceptional representation of "Modern Style" in Barcelona. Delighted with this idea, he concluded with another prophetic sentence for genetic architecture: "Beauty will be eatable or it won't be!" (Dalí, 1933).

Soft and furry. Characteristics not typical of the common architecture. Adjectives that we can attribute to the human body or to any living being. The surreal metamorphosis allows this recreation in an architecture that emerges with such alien characteristics. And this links Dalinian discourse with genetics. Francis Crick and James D. Watson discovered the molecular structure of DNA in 1953, and later in 1962 they received the Nobel Prize in Medicine for their discoveries concerning the molecular structure of nucleic acids and their importance for information transfer in the living matter. Dalí was interested in DNA from the beginning and incorporated it into some of his works, such as in Butterfly Landscape - The Great Masturbator in a Surrealist Landscape with D.N.A. (1957), in which the famous head of the sleeping Dalí in the painting of The Great Masturbator appears supported by crutches above a DNA sequence surrounded by butterflies. Or in Galacidalacidesoxyribonucleicacid, also known as Homage to Crick and Watson (Discoverers of DNA) (1963), where on the right he painted his version of the model of the DNA molecule built with figures of Arabs with rifles that, according to him, imply the ascension of Christ.

A phrase that has ended up being key to genetic architectures. And if he lived now, he would surely be fascinated by the possibilities that in this "soft and furry" way, the also eatable genetic architecture puts him on a plate.

Surrealist and a key manifesto

André Breton, in his *Manifesto of Surrealism* (1924), will declare "it will not be the fear of madness what forces us to lower the flag of imagination. (...) Only the word freedom has the power to exalt. (...) It indicates very bad faith to dispute the right to use the word SURREALISM, in the particular sense that we give to it, since no one can doubt that this word had no fortune, before we used it. I'm going to define it, once and for all:

Surrealism: masculine noun. Pure psychic automatism by means of which one tries to express, verbally, in writing or in any other way, the real functioning of thought. It is a dictation of thought, without the regulatory intervention of reason, oblivious to any aesthetic or moral concern.

Encyclopaedia: Philosophy. Surrealism is based on the belief in the higher reality of certain forms of association scorned until its appearance, and on the free exercise of thought." (Breton, 2002).

All this vision becomes a discovery of creation also for architecture. A discovery even of explanation and justification of the architecture that arises from there. The bolted and even forced imagination, without fear of madness for not to restrict oneself. With the word freedom raised high, allowing to verify the goodness of the projected without any prejudice, academia or regulatory reasoning preventing its birth. This will lead to unprecedented results, never seen before. And above all, the use of "forms of association" that reveal a possible adaptation to the field of architecture and design, which would have never seen the light if such a path of free imagination had not been followed.

A Prophecy and key works of art

Taking a look at works of art that can be considered from the surrealist movement, it is observed that there are authors with no intention of recreating any architecture, such as — to name one of the most famous— Joan Miró, André Masson and René Magritte: this last with some important exception. Figures, human or not, still life, landscapes at most is what runs through the catalog of their work. However, other artists, especially Dalí, offer surreal versions of architectures over and over again. It seems that they have a very explicit interest in constructing concrete buildings. Along with him, but clearly on a lower level of intention, Paul Delvaux, Ives Tanguy and Max Ernst could be mentioned. An approach to architecture arises, an interest for creating landscapes, and this entail an understanding of a certain human scale; which in turn provokes the perception of the elements that they paint as possible constructions; due to such a large perceived scale, it would be possible to consider them as buildings, habitable if desired. All of them under the impact of the works of Giorgio de Chirico, who developed a whole movement himself, a precursor of Surrealism, the metaphysical painting, and further Metaphysicism, as it might be called.

Such a division into two groups of artists, created by seeking a relationship with architecture, could also be extended over time to the two best-known "protosurrealists": Giuseppe Arcimboldo and El Bosco (Hieronymus Bosch). Figures and still life (or rather "figures-still life"), hardly ever landscapes, by the former. A display of fascinating architecture in the works of the second.

Certain forms of Surrealism appear in El Bosco's *The Garden of Earthly Delights* (Figure 1) Some images take us to a fantasy world, with fantastic, invented architectures which seem to have emerged from nature. They are mostly round, curved, with cavities and with amorphous volumes. We also find invented animal figures and scenes with men and women of great imagination. Surreal metamorphosis is served. Then, there is no obstacle that prevents claiming these inventions as genetic architectures *avant la lettre*. All of them imaginable as feasible if you have previous genetic research.



Figure 1. El Bosco, *The Garden of Earthly Delights*, 1490-1500. Right, details of genetic architecture *avant la lettre*.

Some examples can be brought up here, from the collective subconscious of some artists. For example, the cypress, tall, as if it wanted to reach the sky, and evergreen, always green. Hence, it was taken as a symbol of eternity and it is planted in cemeteries. It seems natural then that it is the tree that appears in Arnold Böcklin's enigmatic *Island of the Dead*, where a boat arrives with one of its new inhabitants, accompanied by the same death dressed in white and Charon that leads them, rowing, to then return to our world for the next death. The same light and the same white figure that appears in another other painting, *The Delights of the poet*, by Giorgio De Chirico (Figure 2).

Hans Hollein saw the intense subliminal relationship of all this with architecture: when one of the authors of this article was his assistant professor, in 1994, he asked two newcomer students at the University of Applied Arts in Vienna, as their first exercise, to do an architectural version of this paintings by Böcklin and De Chirico.



Figure 2. Left, Arnold Böcklin, *Island of the Dead*, 1880. Centre, Giorgio De Chirico, *The Delights of the poet*, 1911. Right, detail of the two white figures.

Meanwhile, in his work *Villa by the Sea II*, Böcklin insists on cypresses, this time inclined by the force of the raging wind, which pushes them hard. And a woman dressed in black, in mourning, seems to be waiting on the shore for a loved one who may never return. Again, De Chirico plants a black figure scrutinizing the horizon in the same way (Figure

3). All this to make explicit how De Chirico, a great influence for the surrealists, is also linked with the disturbing symbolism of Böcklin.



Figure 3. Left, Arnold Böcklin, *Villa by the Sea II*, 1865. Centre, Giorgio De Chirico, *Melancholy of a Beautiful day*, 1913. Right, details of both figures.

Then, in a third generational leap, Dalí arrives. He liked cypresses because of a childhood memory, and they appear in many of his paintings. But it is clear that it also captures that same subliminal character that so many perceive. In *Morning Ossification of the Cypress*, the tree, with the intention of being understood as a solid building with an interior space, appears "ossified", hardened in order to be architecture, with a hole from which a white horse emerges with force, almost out of control, but with a body that remind us the putrid, rotting, metamorphosed animals he painted in his Lorquian period. Strange cypresses also appear in Max Ernst's painting, *Solitary Tree and Married Trees*, personifying the trees and granting them the possibility of living accompanied in their eternity, or turning them into architecture and place, into a nest and home of loving spouses (Figure 4).



Figure 4. From left to right: Arnold Böcklin, *Island of the Dead*, 1880; Salvador Dalí, *Morning Ossification of the Cypress*, 1934; Max Ernst, *Solitary Tree and Married Trees* (detail), 1940; Antoni Gaudí, Façade of Life and detail of the central cypress, *Basílica de la Sagrada Familia*, Barcelona, (1882-) 1883-1926 (-2026?).

It is precisely Gaudí who offers a gigantic cypress in the center of the façade of the Life of the Sagrada Familia as it has never seen before in the history of art and architecture. Obviously, many years before the appearance of any of these surreal paintings. The cypress, a perennial tree symbolizing eternal life, is where the souls are housed in the form of white doves for Gaudí. We are now habituated to see this figure, but it is quite

surprising if you see this huge cypress for the first time, or if you look at it with the surreal eyes of Breton or Dalí. It is truly one of the most sublime Surrealism pieces made for architecture, informing us of its "habitability" (Figure 4).

We find pieces of 100% genetic architectures, for example, in the collaboration of Dalí with Alfred Hitchcock for the movie Spellbound: "rooted architectures", as the chimney above the house in the Figure 5. No one could design it better than Dalí. A scene that introduced the viewer to the dream that the protagonist, Gregory Peck, recounted in front of Ingrid Bergman in 1945. And all in a figurative and clear way, immediately understandable to everyone, as usually happens in his works: it is a chimney with roots but also a tree that grows as a rectangular prism to serve as a chimney, or maybe to become a house, by a change of scale. It is both a rock and a face, it is a tree and a house. Is it a rock-man or is it a man-rock? These elements seem inanimate in his paintings.

But in the case of another painter, Max Ernst, his works seem to be alive. Indeed, whether he made a figurative painting an abstract one, it is the ambiguity of the scenes and their relative scale what makes them equally enigmatic, as there is always something to discover or resolve. As in *Europe after the Rain II*, which is crowded with natural elements, variegated, mixed, as if they were growing out of control, with eyes and mouths that are confused in the scrub (Figure 5). Ready to be understood as genetic metamorphoses, which derive and grow as structures and spaces.

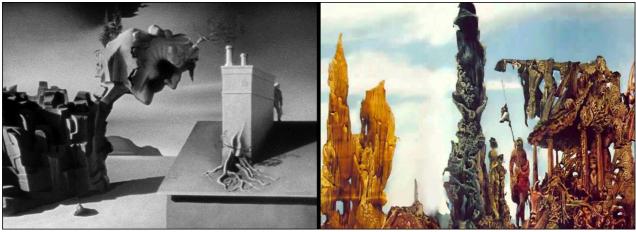


Figure 5. Left, Salvador Dalí, image for the movie *Spellbound* (*Recuerda* in Spanish), 1945. Right, Max Ernst, *Europe after the Rain II*, 1941.

It is interesting to compare these landscapes with those of another surrealist artist, Tanguy, because he also tends to pile organic forms up in infinite landscapes, with equally surreal titles for his works, and reminiscent of Breton's definition: "dictation of thought, without the regulatory intervention of reason" (Breton, 2002). Although with more abstract and ambiguous forms, like that expectant collection of strange beings, or that meeting of stony but fleshy objects, a kind of track surrounded by organic pieces (Figure 6). It is surprising to see the affiliations that this arouses with Gaudí's work, for example, in Casa Milà (La Pedrera) in Barcelona, understood from the filter of Surrealism.



Figure 6. Left, Yves Tanguy, *From Green to White*, 1954. Right, Antoni Gaudí, Casa Milà (La Pedrera), 1906-10 (-11), a fragment of the image on the left superimposed at the bottom.

On the other hand, it is fascinating to corroborate that the "mystery" of the scenes appears with both abstract and figurative objects. In both Tanguy (abstract) and Dalí (figurative), something disturbing arises in turn, perhaps due to their special disposition in the space presented, due to the exact mutual distances between objects, charged with magnetic, almost electric stresses, and their relationship with a more or less desert landscape environment. It seems that if the pieces were closer, the tension would collapse, and if they were separated, they would be lost. All this influenced by the work of De Chirico. But he received also the influence of the still life of Francisco de Zurbarán, Juan Sánchez Cotán, and even Giorgio Morandi (Figure 7). They are here presented and compared with their respective metamorphoses in microscopic structures, promoted by one of the authors of these pages, using the scanning electron microscope (SEM) as a tool.



Figure 7. Above, from left to right, Still Life of Francisco de Zurbarán (*Still Life with Pottery Jars*, c. 1660), Juan Sánchez Cotán (*Still Life with quince, cabbage, melon and cucumber*, 1602), Giorgio Morandi (*Still Life*, 1920). Below, from left to right, metamorphosis for the *Still Alive* series, of Alberto T. Estévez (*Invocation's Gesture, Lips and Mouths of Dark Power, Glass' old man*, 2009-10), created with scanning electron microscope (SEM), and titled with the verses that the surrealist poet Juan Eduardo Cirlot dedicates to Gaudí's work.

Certainly, Ernst and Tanguy approach the subject from two totally different aesthetics, although both serve the same purpose, discussed in this writing, since they have in common the approach of a surreal landscape, full of natural elements, building the stage with their forms. Genetics would be a way to make such surrealities a reality. Dalí is the champion in these competitions. Remember for example the famous Dalinian motif of elephants with insect legs, a capture of a surreal metamorphosis. The biggest and heaviest animal, supported by four legs, like four sticks, without affecting its balance and supporting it all. Of course it sounds as a genetic mutation, especially because of the great interest that the discovery of DNA found in Dalí.

But Gaudí was the pioneer of all. Dalí was inspired, and also justified by him. And the authors of genetic architectures find also an origin in him. Casa Milà (La Pedrera) and Casa Batlló, by Gaudí, have the architectural and organic forms of the landscapes of Tanguy (Figure 6), or of Dalí's paintings, reflecting a soft and edible architecture. For example, in *Birth of liquid desires* or *Le spectre du sex appeal*. Dalí was fascinated by melted cheese, undercooked omelette, the slimy snail tracks. For these reasons, he found surprising the way in which Gaudí's stone melts into fluid curves. Specially, when the avant-garde architecture of those 20s and 30s was orthogonal and rational. The cavities and organic masses of Casa Milà appear in also in his paintings. And the thin sticks or crutches that he placed to hold melting meats are also similar to those of Casa Batlló that support the stone flowing soft and free, ignoring the characteristics of its own hardness (Figure 8).



Figure 8. From left to right: Gaudí, detail of Casa Milà (La Pedrera), Barcelona, 1906-10 (-11); Dalí, *Birth of liquid desires*, 1932; Gaudí, detail of Casa Batlló, Barcelona, 1904-06; Dalí, *Le spectre du sex-appeal*, 1934.

Genetic architectures, architectures of the 21st century

This is how surrealist principles stand as precursors to genetic architectures, generated biologically or digitally. Surrealism has offered the first examples of objects, landscapes and genetic architectures. Those principles remain as their explanation and justification. Becoming ways of creation, a method or a strategy for the architecture and design discussed here. Architectures that, by using the techniques that are characteristic of our times, of the 21st century, are in turn the architectures suitable for them. Therefore, those that must be considered, researched and carried out.

For example, images coming from microscopic research, especially those made by Alberto T. Estévez with a scanning electron microscope (SEM), become surreal objects,

landscapes and architectures (Figures 7 and 9-11). And thanks to new techniques they can in turn transcend mere graphics and become a constructed reality. A reality quite different from the one described properly by Josep Quetglas: "official title of appearance, of the violence of the instituted" (Quetglas, 2002). On the contrary, a reality that emerges alone, autonomous, from the freezing of a brief moment, coming from the chaotic soup of nature, in this case microscopic, that traps the author-demiurge as an incisive blade. And this channels it to a second emergency, as the forms of Ernst or Tanguy emerge, thanks to digital design and manufacturing tools.

Those paintings by Tanguy, with the simple change of the scale of the elements painted, turn the ambiguous scenes into landscapes of objects, buildings, or cities. In the same way that a microscopic landscape can be created through the use of an SEM, equally surreal in its perception, and always inspiring of objects, buildings, or cities. From there to the natural 1:1 scale, for example the landscape created at UIC Barcelona (2020) thanks to the entirely digital design and production of the pieces from the *Radiolaria* and *Hyperboloid Barcelona Furniture Collection series* (Figures 9 and 10).



Figure 9. From left to right: Yves Tanguy, *Multiplication of the Arcs*, 1954; Alberto T. Estévez, from the *Landscapes Series, Silver landscape*, 2010; Alberto T. Estévez, landscape with pieces of the *Radiolaria* and *Hyperboloid Barcelona Furniture Series/Collection*, UIC-Barcelona, 2020 (collaborator: Pablo Baquero, computational designer).

And in front of the "fortuitous encounter" that Ducasse said, of decontextualized realities, propitiated by the "channel of beauty" that Gaudí said, what Breton described (Figures 7 and 9-11) occurs: an "ideal moment when man, in the grip of a particular emotion, is suddenly seized by this something 'stronger than himself' which projects him, in self-defense, into immortality. (...) The whole point for him is not to be free of it, for him to go on talking the entire time this mysterious ringing lasts (...) products of psychic activity, as far removed as possible from the desire to make sense" (Cirlot, 1993).

This quote must be excused, since the internal human mechanism could not be better described when looking at genetic architectures, since they are fully aligned with the surreal metamorphosis. They will always have the hindrance to serve daily functions, a responsibility that could stop their independence, their affiliation to "the passive life of the intelligence". Genetic architectures, biodigital designs, like the surrealists, have "the advantage of being unique in providing elements of appreciation of great style to a body of criticism which, in the realm of art, reveals itself to be strangely helpless, of permitting a general reclassification of lyrical values", as Breton continued to say (Cirlot, 1993).



Figure 10. From left to right: Yves Tanguy, *The Rapidity of Sleep*, 1945; Alberto T. Estévez, *The beat of Iron*, 2010; Alberto T. Estévez, landscape with pieces from the *Radiolaria* and *Hyperboloid Barcelona Furniture* Series/Collection, UIC-Barcelona, 2020 (collaborator: Pablo Baquero, computational designer), and with the Biodigital Barcelona Pavilion in the background.

Finally, at this point, the understanding of the character of surreal metamorphosis that works in genetic architectures is considered sufficiently explained. Exemplified in these pages with the designs made by one of the authors, Alberto T. Estévez, at the Genetic Architectures Office, researching with the Genetic Architectures Research Group, and taught in the Biodigital Architecture Master Program. All framed as three departments at iBAG-UIC Barcelona, the Institute for Biodigital Architecture & Genetics of the Universitat Internacional de Catalunya Therefore, sincere thanks for the loyal actions of its members must be present here now.



Figure 11. Alberto T. Estévez, from the Series *Landscapes*, 2008-2018, created and perceived from a surrealist perspective with a scanning electron microscope.

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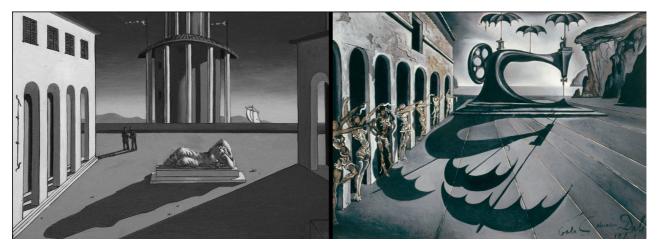


Figure 12. Left, Giorgio De Chirico, *Italian Square*, 1955. Right, Salvador Dalí, *Sewing Machine with Umbrellas in a Surrealist Landscape*, 1941: from Isidore Ducasse famous sentence, passing through Giorgio De Chirico, to the Surrealism of Dalí.