THE SYMBIOSIS OF ART AND SCIENCE

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Abstract: *Over the years we were accustomed to perceive art and science as two completely opposite concepts of the world. You have to choose either you are a scientist, either an artist, there is no between. But the unknown, or the* unnoticed, harmony among erudition and artistry is what makes their bond mysterious and fascinating. From reading people's mind through art to da Vinci's sketches of machines used by today's engineers, exists an endless list of meeting points.

Keywords*: psychiatry, painting, history, mechanic, engineer.*

Introduction

Leonardo da Vinci once said "Principles for the Development of a Complete Mind: Study the science of art. Study the art of science. Realise that everything connects to everything else." The main concept to apprehend is that not only science, but art as well, is about observation and creation. If someone is captivated by both of them, there is no one or another, but a lot of domains to choose from, for instance architectural designer, medical illustrator and animator, industrial designer, digital artist.

Art for human's brain

Psychiatry as a hybrid science that combines both natural and social science, tries to explain abnormalities in human's brain and behavior. And what approach can be more subjectively than art to read someone's mind? Even if in the 20th century was the most distinguished interface between arts and psychiatry, the theory is still available nowadays. Art therapy remains a great approach in therapy for people with mental disorders. Worth mentioning is also, that extreme mental states – the art of the 'outsider' and the mentally disturbed – became an object of interest as another form of 'primitivism'. One of the most popular methods to caricature them is cinematography, movies about the most recognizable disorders, like Rain Man, A Beautiful Mind. At the same time, the most famous way to recognize the changes in mental balance remains painting, drawings, and sketching [1].

But how art can help neuroscience and psychiatry? It's a well-known fact that people suffering from mental illnesses usually have lack of strength of mind and connection with reality, which is essential in communicating their instinctual desires in a coherent way. Art and creating art are indispensable tools for therapists to determine the roots of a person's mental state, because their creations serve as indicators, or even confirmations, of some disorders. Indicators like presence/absence and dominance of movement, contour, repetition, the mixture of colors, saturation, also how clear the work is, can teach a lot about someone's mind stability. It is crucial to understand that a therapist cannot diagnose a person by its art, it is practice to provide information about the clients' inner world. Moreover, it is still a great basis for a person's mental state and focus for treatment if needed.

Architecture and Art: The Known Harmony

Art and architecture are developed employing the same organizational principles, aesthetic aspects, and sensory involvement. Art and architecture both have a role. They are expressive as well as communicative. The artist "shapes" an object to visually express a complex set of ideas, which the audience ultimately accepts. Architects create habitable or usable spaces, but their architectural designs are also significant in their own right.

Art and architecture have a prominent attachment one to another. In her book, "Architecture and Art: A Place Between", Jane Rendell expounds "Architecture's curiosity about contemporary art is in no small way connected with the perception of art as a potentially subversive activity relatively free from economic pressures and social demands; while art's current interest in architectural sites and processes may be related to architecture's so-called purposefulness, its cultural and functional role, as well as the control and power understood to be integral to the identity of the architect." [2]. Art may not be functional, unlike architecture which has a well defined plan, a thoughtful design in response for social needs. But the world started to offer art 'functionality' in an untraditional way, and when it comes to civic projects both of them can approach critical spacial practice. An example of this practice is the famous UNAM campus, located in Mexico City, where are found O'Gorman murals, modernist buildings with bold geometry, abstraction, humanistic design and local lava rocks used as walls, big and colorful metallic sculptures.

Leonardo da Vinci: The artist and the engineer

Best Known for his unprecedented paintings, as Mona Lisa (1503), Vitruvian Man (1485), The Last Supper (1498) or Madonna and the Child (1490), da Vinci was also ardent about anatomy, aerodynamics, hydrodynamics, geology, zoology, botany, even mechanics. Moreover, in the book "Leonardo da Vinci: Art in Science", written by James S. Ackerman, Leonardo's efforts to build new scientific techniques are described as being elevated to a comparable level by the grandiose scope of his endeavors, making them pertinent to a study of the boundaries between science and other parts of culture.

Leonardo once said: "Non mi legga chi non e matematico." ("Let no one read me who is not a mathematician."). Doubtlessly, geometry played a major role in his work. For instance, "Vitruvian Man", is a proof of the interdependency between his works and an iconogram. Furthermore, the unique mathematical relationship, called "golden ratio", was already used by Da Vinci in his masterpieces even before he had a collaboration with the mathematician Luca Pacioli. Around 1509 was published the "De Divina Proportione", not only illustrated by Da Vinci. After the publication the "golden ratio" became a critical instrument in the matter of accurate proportionality for Resaissance geniuses. As a great example for this is the famous painter Raphael and his masterpiece "The school of Athens".

Da Vinci the inventor was not just a dreamer, his sketches were used centuries after in changing our world. He created portable bridges, mirror-griding machine, diving suits, first odometers and anemometers. Even if he had an animosity for wars, he sketched the first machine gun, an armored vehicle with metal-coverage. Not to mention, the robotic knights, a self-propelled cart, which was the inspiration for robotics expert Mark Rosheim, and later his design of planetary exploration robots – for NASA [3].

In an article posted on a website to honor the master is specified that "One of da Vinci's most famous inventions, the flying machine (also known as the "ornithopter") ideally displays his powers of observation and imagination, as well as his enthusiasm for the potential of flight. The design for this invention is clearly inspired by the flight of winged animals, which da Vinci hoped to replicate. In fact, in his notes, he mentions bats, kites and birds as sources of inspiration" [4].

Leonardo da Vinci may have grasped the psychological consequences of weaponry in combat better than any of his contemporaries. Da Vinci understood that the dread weapons might cause in foes was just as significant (if not more vital) than the destruction they could inflict.

In Figure 1, as an example, it is represented a sketch of a flying machines with the pilot prone.

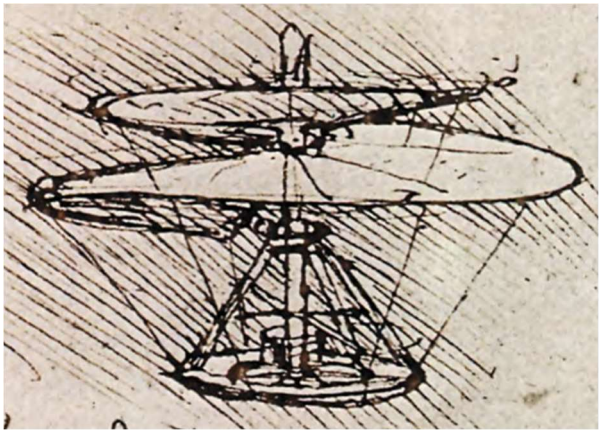

Figure 1 A flying machine [4]

"The Vitruvian Man is a 1480 pen and ink sketch on paper, sketched in Figure 2. The image of a nude guy standing inside a square and a circle eloquently portrays the unusual convergence of art and mathematics – an area in which Leonardo devoted the majority of his time during his life.

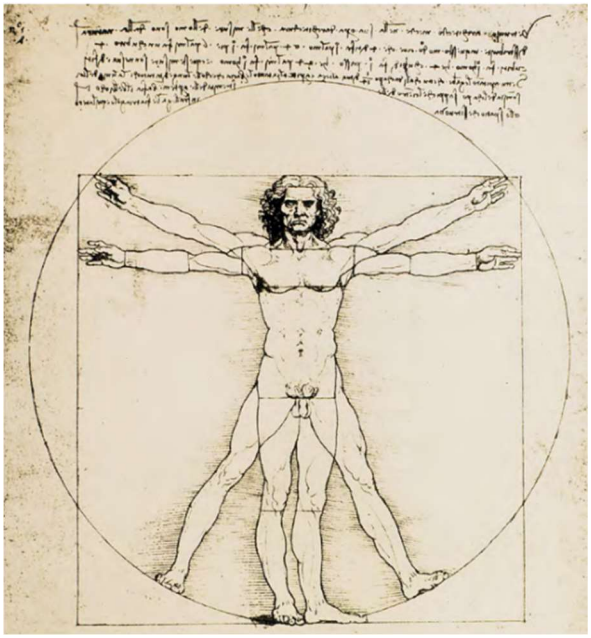

Figure 2. Vitruvian Man [4]

The Golden Ratio is used in the Mona Lisa to portray Leonardo DaVinci's philosophy of interdisciplinary art through human faces. This mathematical relationship in the Mona Lisa captures the divine simplicity and harmony of the Holy Trinity.

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Viewed in figure 3, in the Mona Lisa, it captures the divine simplicity and harmony of the Holy Trinity.

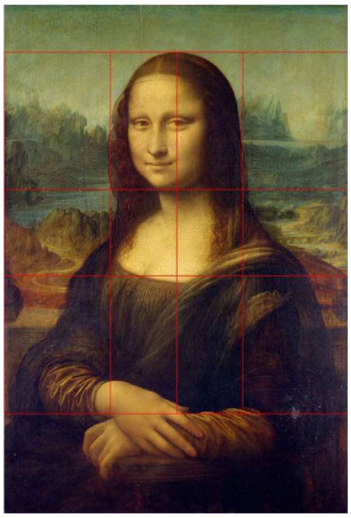

Figure 3: Golden Ratio in Mona Lisa [5]

Conclusion

There can be no doubt that Art and Science can live in a symbiosis. As they working in two absolutely different cultural spheres, they can also complete each other, making the individual's decisions effortless and visions more clearly. Finding that meeting point is what makes people creators, there is no way back. This relation gives the humankind the opportunity to make a permanent contribution to the development and enrichment of human existence through art and science in their broadest dimensions, and it is these endeavors that we students are involved in.

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