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The Mechanism – between Applicability and Artistic Concept – on the Axis of Antiquity, Middle Ages and Modernism

Răzvan-Petrișor Dragoș*

Abstract: *In Antiquity, civilization meant the invasive intervention on nature and the environment through deforestation, landscape changes, the extinction on fauna and flora and so on. Both in Antiquity and in the Middle Ages, technology was closely related to the production of material goods, construction, agriculture and trade, without being associated with the idea of art, so we cannot talk about any aesthetics of mechanisms. We can say that the devices made for the plays or "automata" type mechanisms from the time between the end of Antiquity and the Middle Ages, were a preamble to visual arts of technological origin. Starting with the Renaissance, "automata" devices migrated to a new environment: that of small circles, formed by the high society. After less than three millennia of scientific evolution, today one can speak about artificial consciousness and the transcendence of the physical capacities of beings. The robot, in the philosophical sense, is an interpretation of the living body that exercises its capabilities in its own repetitive manner. The illustration of mechanisms by engineers has been common since the Renaissance. Of all the inventors of the Renaissance and of all times, one stands out in particular, namely Leonardo Da Vinci. From the issue of pagination, spatiality and shapes circumscribed in geometric structures, Leonardo pleaded for both technical and visual solutions. One conclusion of the above is that through technical valences they could borrow from art, mechanisms have caught people's attention since time immemorial, so we will find countless applications of them throughout history.*

Keywords: *„automata", mechanism, Middle Ages, Modernism, robot, engineer, programming, technician*

The fundamental problems of the human being, viewed as an individual, not in the broad context of humanity, seem to be the same from the beginning of history until now. Between Neolithic and Modern man, there are practically only cultural and mental differences, what changed over time is only the relation to external reality, as it could and can be accessed through the senses and through pre-existing information sources. To give just one example, the Library of Alexandria, the most significant citadel of

* Academic Assistant at the Faculty of Arts, "Ovidius" University, Constanţa, Romania, email: dragos.razvanpetrisor@yahoo.com

Greco-Roman civilization, was undeniably a veritable cradle of science, with its over 900,000 parchments, which undoubtedly represented the total amount of information accumulated up to that time[1]. After the famous arson (and implicitly, loss), the world must have changed radically. In other words, the perception of the society and the environment differs from one era to another.

In Antiquity, civilization meant the invasive intervention on nature and the environment through deforestation, landscape changes, the extinctions on fauna and flora and so on. Today, civilization supposes the exact opposite: afforestation, the creation of reservations, environmental protection laws. The idea is that man, as a species, excels in the artificial environment. The home, the city, the fortress, the technology, the craft, even the art, are all artificial. In fact, the words "artificial" and "art" have a common root. Moreover, there was no difference between the craft, called in ancient Greece *techne* and art. Plato even excluded artists from the ideal city.

Our consciousness is in a permanent process of (re)discovery based on: principle, axiom, value, experience, information, method, technology, corresponding to different historical periods. Art, a field that especially interests me, also responds to a certain extent to social requirements, if we take into account, for example, the commands or the ritual functions with which artifacts can be associated[2]. The desideratum or the requirements of the society have always imposed artistic standards and trends, regardless of the inclusion of art in the field of craftsmanship or aesthetics.

A fundamental question concerns the intrinsic nature of art. According to Marx, work created man, while for Hegel, art is the very justification of existence. Both thinkers, one materialist and the other idealist, used dialectics as a working tool in their philosophical arguments. I brought up this issue to point out that whether we are dealing with applied art (craft-related objects) or art for art's sake (strictly aesthetic creations), there is a point of confluence between these partially distinct routes, consisting of their artificial nature, distinct from all that can be produced by nature, either by consequence or by the play of chance. The encounter of art with craft, through technology, has its own laws of composition, through which man is interested in transmitting states, gestures, thoughts or emotions. *Aisthesis* is nothing but a way through which the human being tries to reconcile his outer world with his inner world[3].

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[1] Roy MacLeod, *The Library of Alexandria: Centre of Learning in the Ancient World,* I.B. Tauris Publishers, London, 2000, pp. 1-15

[2] George L. Hersey, *Falling in Love with Statues: Artificial Humans from Pygmalion to the Present,* The University of Chicago Press, Chicago, Illinois, 2009, p. 82.

[3] Constantin Aslam, *Paradigme în istoria esteticii filosofice (I) Din Antichitate până în Renaştere/Paradigms in the history of philosophical aesthetics (I) From Antiquity to the Renaissance*, European Institute Publishers, Bucharest, 2013, p. 16.

Both in Antiquity and in the Middle Ages, technology was closely related to the production of material goods, construction, agriculture or trade, without being associated with the idea of art, so we cannot talk about any aesthetics of mechanisms. However, a first meeting of technological applications with art took place under the aegis of scenography, even since Greek antiquity [4]. Classical theater involved, among various constant elements (such as playing with masks, choir, carrying out the action during a single day) the intervention called *Deus ex Machina*. Since the ambivalent logic coexisted with the bizarre one, i.e. the imaginary was considered part of reality and the god a tangible entity with extra-powers, there was a need for technological mechanisms through which divine interventions could be embodied in plays. For this purpose, dedicated mechanisms and gears were created, meant in principle to introduce and remove from the scene various characters (gods) artificially, usually by air, through carts operated by means of hidden mechanisms[5].

We can say that the devices made for the plays or "automata" type mechanisms from the time between the end of Antiquity and the Middle Ages, were a preamble to visual arts of technological origin. Of course, people in those times did not interpret technological ensembles as works of art, *ad litteram*. The role of the mechanism was reduced to its impact. Ancient man, like the medieval one, was both fascinated and intrigued by the "invisible" forces, ignoring the scientific and technological reasons behind. What struck him about these devices was the ability to simulate the natural model. Mechanical kinesthesia in fact induced a state of contemplation of the (re)discovered natural phenomenon.

Since time immemorial, people have tried to give the figurines the possibility to move. The most rudimentary examples date from 2,500 BC and were discovered in the ancient Greece and Rome territories. Small wooden or clay statuettes can exercise a single form of movement with the help of ropes placed on the movable articulated limbs. Absorbing human or animal movements represented the "animation" of objects in a kinesthetic regime.

With extensive experience in the fields of physics, natural sciences and mathematics, Hero materialized the concept of using abiotic devices for theater (entertainment). Inspired by Archimedes' research, more precisely on the use of pulleys, he practically designed a series of mechanisms constituted in spectacle-generating objects. From the manuscripts that survived (over 2,000 years), we know that Hero designed, for example, various cranes and

[4] Judith McKenzie, *The Architecture of Alexandria and Egypt, C. 300 B.C. to A.D. 700,* Yale University Press, New Haven andLondon, 2007, pp. 323-328.
[5] James M. Russell, *Plato's Alarm Clock: And Other Amazing Ancient Inventions*, Michael O'Mara Books Publishers, London, 2018, pp. 4-5.

presses based on the use of rotational motion. His extensive activity represents a model for the application of technology in the visual arts[6].

Following the course of history, we inevitably arrive at the concept called (post factum) "automata", which also passed, over time, through several stages. In Antiquity and the Middle Ages, it was associated with mystical, magical or fantastic parameters. The construction of a device uncoupled to an identifiable energy source was an inviting and exhilarating realm that belonged at the same time to a utopian segment[7]. Beyond the (pseudo)transcendental aspects, the viewer was directed towards the technological and scientific sphere, in which the mystic also had a hybrid role. The catalyst for this process was nothing but the spectacle. This should not be surprising, given the success of the famous cabinets of curiosities, biological aberrations or exotic animals. It is well known the statement of a European nobleman who, seeing a giraffe, said that such a thing does not exist.

In the Middle Ages, the most common examples of automatic mechanisms are the clocks located in almost all major cities, that were a culmination of civilization for their citizens. Their purpose was to establish the concept of order, stability and discipline. The accuracy of the watch was considered to be the solution to combat harmful factors such as disease, murder, fire or epidemics, common at the time. The bell sounds of the medieval clocks had an important social role, contributing to the distancing from nature, considered a wild, uncivilized space[8].

Numerous medieval documents associate the clock with the human body, considering an extension of it. The interconnection between the two mechanisms, biological and technological, is validated by the fact that in order to build such a mechanical object, man has to capitalize not only on his technical attributes, as an inventor, but also on his artistic ones, as a sculptor. The "automata" mechanism can be categorized as an analogy of technique and art, and the craftsman can be considered a full-fledged creator. The gears and components of functional devices are starting to acquire, in addition to the kinetic aspects, aesthetic attributes.

With the Renaissance, "automata" devices migrated to a new environment: that of small circles, formed by the high society. The mechanisms were no longer made available to the ordinary member of the

[6] Valeriu V. Jinescu, *De la șurubul lui Arhimede la mașinile moderne cu elemente elicoidale/From Archimedes' screw to modern machines with helical elements*, Agir Publishers, Bucharest, 2012, p. 57

[7] George L. Hersey, *Falling in Love with Statues: Artificial Humans from Pygmalion to the Present,* University of Chicago Press, Chicago, Illinois, 2009, p. 83.

[8] Hamish M. Scott, *The Oxford Handbook of Early Modern European History, 1350-1750*, Oxford University Press, Oxford, 2015, pp.146-149.

public. The evolution of mechanics, essential for performing mimetic movements, led to a new era of mechanisms starting from the 17th century.

At the basis of the flourishing of the "automata" mechanisms two main factors stood: the miniature rendering of the functional components and the appearance of the mechanical cams. The first factor made it possible to restrict the size of the devices. The second factor, which completely changed the operation of automatic devices, namely the use of cams, made it possible to record a pattern that could be performed repeatedly. That function, as trivial as it may seem today, is the beginning stage of computer programming[9].

Jacques de Vaucanson (1709-1782) is one of the most representative creators of automatic mechanisms, his working principles being strictly related to the simulation of (living) biological forms and actions with the help of mechanisms. Among his most controversial and complex creations is the mechanical ensemble consisting of a doll playing the flute, another one the tambourine and a mechanical duck. Each of them is programmed to imitate to the smallest detail the action of the living body, without using any adjacent device for reproducing sounds, produced by mechanical action.

Vaucanson's flute singer managed to simulate a complex human activity exclusively by technical means. All elements (gestures) of the action were observed. The anthropomorphic character has the ability to exhale air through the so-called lungs, to use his (silver) tongue to blow into the instrument (it is, no more, no less about wind instruments playing technique) and to use his fingers to play notes. According to the preserved sketches, even the character's skin was natural. This closeness to the real form of a being has inspired generations to meditate on the similarities and differences between the living person and the artificial replica.

Like Leonardo Da Vinci, Vaucanson believed that a mechanomorphic creation must have a natural pattern. By researching and understanding biological functioning we can simulate life. Extrapolating, by knowing the principle of functioning, any action of living beings can be reinterpreted by mechanisms[10].

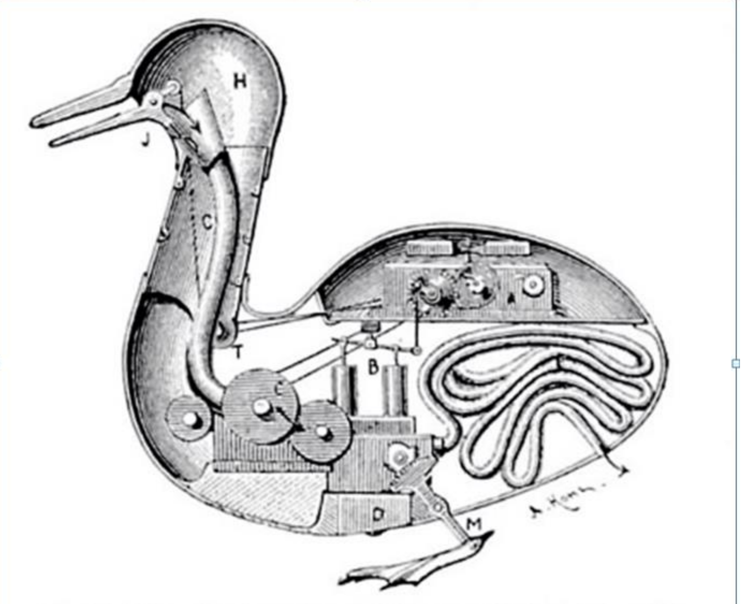
Another type of approach to transposing the actions of living beings in the technological climate would be the work entitled *Digesting Duck*[11]. It embodies the digestive tract of a live duck. The mechanical work was able to flutter its wings, move, eat and drink water. The sketches also included the

[9] Carlos López-Cajún, Marco Ceccarelli, *Explorations in the History of Machines and Mechanisms: Proceedings of the Fifth IFToMM Symposium on the History of Machines and Mechanisms*, Springer Publishers, Switzerland, 2016, pp. 84-85.

[10] E. C. Spary, *Eating the Enlightenment: Food and the Sciences in Paris, 1670-1760*, University of Chicago Press, Chicago, Illinois, 2014, p. 43.

[11] John Chapman, *The Westminister and Foreign Quarterly Review* Vol. XVI, Art. IV, *The Life of a Conjuror*, London, 1859, p. 94.

food processing and digestion system. Of course, here the trophic chain simulation has a parallel route. However, devices of this mechanomorphic order are considered the first robotic achievements in human history[12].



INTERIOR OF VAUCANSON'S AUTOMATIC DUCK.
A, clockwork; *B*, pump; *C*, mill for grinding grain; *F*, intestinal tube; *J*, bill; *H*, head; *M*, feet.

Fig. 1. Illustration of the mechanism of operation inside the "Digesting Duck" published in the journal "Scientific American" / year: January 21, 1899

A striking example of the complexity the use of cams can reach to is that of the mechanism known as the *The Writer*, built by the watchmaker Pierre Jaquet-Droz (1721-1790) towards the end of the 18th century. The mechanical doll, composed of over 6,000 pieces, can write sentences on paper. What is striking is that one could intervene in a controlled way on the mimetic action so that the written words look different[13].

Another remarkable automatic mechanism that the watchmaker made is *The Draughtsman*. As in the case of *The Writer*, the mechanical doll has the face of a child, only it has the ability to draw four distinct images: the portrait of King Louis XV, the Royal couple (consisting of Queen Marie Antoinette and King Louis XVI), a puppy with the inscription "my puppy"

[12] Julien Offray de La Mettrie, *Man a Machine*, Createspace Independent Publishing Platform, Scotts Valley, California, 2016, p. 16.
[13] Adelheid Voskuhl, *Androids in the Enlightenment: Mechanics, Artisans, and Cultures of the Self*, The University of Chicago Press, London, 2013, p. 59.

and a composition depicting Cupid leading a chariot drawn by a butterfly. In addition to the action of drawing, the mechanical boy periodically takes the pen to his mouth, after which he blows air to remove the dust[14].

Fig. 2. Author: Pierre Jaquet-Droz (1721-1790) / Title: The Automatic Writer / Size: 70 cm Height / Collection: Neuchâtel Museum of Art and History, Switzerland

It can be argued that these representations are among the first forms of mechanical programming, where mechanical components record a certain type of movement.

A special case of "automata" mechanisms is the work entitled *The Turk*, also known as the *Mechanical Turk* or *Automatic Chess Player*, the mechanical installation made in the late eighteenth century by the Hungarian inventor Johan Wolfgang Ritten vin Kempelen de Pázmánd (1734 -1804). It is also a functional mechanical assembly, based on the correspondence between the mechanism and the living being. This device created to impress

[14] Clare Vincent, Jan Hendrik Leopold, Elizabeth Sullivan, *European Clocks and Watches in The Metropolitan Museum of Art*, The Metropolitan Museum of Art Publishers, New York, 2015, p. 218.

the Empress of Austria, Maria Theresa, is in fact a mechanical chess player able to play a (somehow) strong game.

Inspired by the performances of the illusionist François Pelletier, Kempelen "cheated", in fact conceiving a pseudo-automatic mechanism directed by a character hidden from the eye of the public in a compartment of the installation. The mechanical doll wore traditional Turkish clothing and regularly smoked a pipe. Becoming famous, the work toured Europe, succeeding in defeating some of the most representative chess players of that period. Unfortunately, it was destroyed in a fire in 1854[15].

It is time to emphasize that the simulation of life through mechanism has archaic origins. After less than three millennia of scientific evolution, today one can speak about artificial consciousness and the transcendence of the physical capacities of beings. The extremely complex programming can today replace the reasoning and actions of the living body, at least in results and finality, if not through real awareness. The robot, in the philosophical sense, is an interpretation of the living body that exercises its capabilities in its own repetitive manner.

The illustration of mechanisms by engineers is common since the Renaissance. Until then, we are dealing with the primacy of the prototype, which, once destroyed, also involved the loss of the project or the idea of operation. Notable personalities such as Guido da Vigevano (1280-1349), KonardKyeser (1366-1405), Mariano di Jacopo Taccola (1382-1453) or Francesco di Giorgio (1439–1501) designed and theorized countless methods of mechanical operation, preserved as drawings or in sketchbooks. In the books of the 15th and 16th centuries we find an impressive series of mechanical illustrations made by many authors from different parts of Europe[16].

Of all the inventors of the Renaissance and of all times, one stands out in particular, namely Leonardo Da Vinci, on whom I will dwell, giving him, as is normal, the most important part in this essay. The great artist and scientist, in whatever order the reader wishes, distinguishes himself from his counterparts by the fact that his drawings illustrate the functioning of mechanisms by the individual exposure of each element. Leonardo not only managed to draw or design certain devices, which were more or less ingenious, but he also represented them from all angles, accompanied by the related annotations, thus explaining the whole operation process.

Therefore, we are not dealing only with simple technical illustrations or sketches that represent certain devices and mechanisms, but with thorough

[15] Florian Vauléon, *Reading Jean-Jacques Rousseau through the Prism of Chess*, University of Michigan Press, Ann Arbor, Michigan, 2009, pp. 18-21.
[16] Francis C. Moon, *The machines of Leonardo da Vinci and Franz Reuleuax*, Springer Publishers, Switzerland, 2007, p. 76.

studies, based on technical elements. These include compositional formulas, ingenious relationships, elements of rendering three-dimensionality with two-dimensional means and many other intellectual challenges. From the issue of pagination, spatiality and shapes circumscribed in geometric structures, Leonardo pleaded for both technical and visual solutions.

The rendering of the functional stages of a mechanism-device are specified by the engineer-artist, who has the intelligence to sketch the phenomenon in the most precise way, in relation to the mechanisms themselves. Another peculiarity of Da Vinci's drawings is the type of vision and execution. Thus, we have a whole arsenal of graphic signs in the field of architecture, military engineering or anatomy. Artistic execution is a great advantage in this regard, especially since it is consistent with the engineering thinking of the elements (regarding the components of the abiotic body)[17].

In short, Da Vinci's sketchbooks are masterful. The proposed images, with the necessary annotations, extremely precise and rational, take into account the perspective of possible materializations. Therefore, the explanatory texts, the pertinent observations and the projections represent a true anatomical, engineering, architectural, but also artistic codex[18].

Although there is a well-defined order in the preservation and classification of his sketches and projects, many of them have not been dated or signed. Even if they do not have any chronological indication, we can see the quality and logic of his drawings. The pages of his notebooks were often (quite) loaded with drawings and an impressive number of explanatory notes (referring to the approached studies).

For a complex research of functionality, it is necessary to understand the relationship between the user and the dynamic components of the technical body, in their entirety. Most of the technical mechanisms of the Renaissance were designed to use the force exerted by humans or animals, this being a serious energy limit. Leonardo's great innovation is the complex study of the relationship between the devices themselves and the propulsion sources, borrowed directly from biomechanics, without the losses due to friction from additional gears.

The human body, for example, has been treated by the scientist as a kinematic body, because at the base of biological or mechanical movement there are the same dynamic processes. The tests on human bodies and the analysis of mechanical functioning coincide at the principle level. Studies on the human body have been done to find out what happens to certain muscle groups in different circumstances when they are subjected to kinetic stress[19].

[17] Leopold Infeld, *Leonardo Da Vinci and the Fundamental Laws of Science*, Guilford Press, New York, 1953, pp. 26-41.
[18] Max Jammer, *Concepts of Force,* Cap. IV *Force and the rise if classical mechanics,* Dover Publications, Mineola, New York, 1999 , p. 65.
[19] Martin Clayton, Ronald Philo, *Leonardo Da Vinci: The Mechanics of Man,* Royal Collection Enterprises Publishers, London, 2010, p. 78.

The idea was that the energy generated by human force could be optimally taken up by the technical components to reach certain types of kinesthesia. It is in fact about optimizing the mechanical gears. Da Vinci always tried to relate to the force that the human body can exert.

However, his area of concern included other areas too, such as volumetric changes, shape transformations or fluid mechanics. The distortion of shapes that preserves its volume foreshadows today's composite materials, known as intelligent materials, endowed with a so-called memory. To reach this paradigm, he was inspired, among other things, by Hippocrates' theory called *Lune*[20].

The perpetual motion machine could not miss from Leonardo's field of research. Reading the sketches, we find that the concern for perpetual motion without energy consumption was a constant of his activities. The search was aimed at eliminating the forces that oppose the kinetics. The remaining sketches are, of course, non-functional, but they have aesthetic value, especially since, on paper, they seem to be viable. Calculations reinforce this feeling, especially since it abounds in variables. However, his drawings show that Leonardo had the ability to realize whether or not his inventions could be put into practice. In the case of mechanisms dedicated to perpetual motion, he stated *ad litteram* that no option is sustainable[21].

The project of flight, also utopian, occupied a major place in Leonardo's research. In a first phase, he studied for two decades the functioning of the avian wings. During this time, he executed over 500 sketches with the aim of designing technical devices that would approach exactly the wings of birds. The zoological study shows that in order to be able to beat its wings, birds use their pectoral muscles. Following this analogy, the artist imagined various anthropomorphic mechanisms. I point out that the designed flight devices had only a decorative role, serving only as a prop in the theater[22]. In his military engineering sketches, there is no reference to flight devices, which is why we can deduce that certain projects were designed strictly for entertainment.

A second stage of study for the devices dedicated to flight begins in 1480, when, this time the scientist, not the artist, began to propose technical sketches depicting self-contained aircraft. Most of them offer pedal systems or cranks powered by human energy. Among them are some glider plane proposals[23].

[20] Bulmer-Thomas Ivor, *Hippocrates of Chios, in Dictionary of Scientific Biography*, Published by Charles Coulston Gillispie, New York, 1972-1990, pp. 410-418.

[21] Stanley Angrist, *Perpetual Motion Machines*, Scientific American Publishers, New York, 1968, pp. 115-122.

[22] Walter Isaacson, *Leonardo da Vici,* Simion&Schuscer Publishers, New York, 2018, p. 206.

[23] Carlo Pedretti, *Leonardo: The machines,* GiuntiPublishers, Venice, 2000, pp. 5-8.

Last, but not least, one direction approached by Leonardo is that of military engineering. Numerous mechanisms invented by him were dedicated to military actions, whether defensive or offensive. For some of his projects and sketches, Leonardo was inspired, according to sources, by the previous research of other visionaries, such as Roger Bacon (1219-1292) and Roberto Valturio (1405-1475).

In his technological projects, Da Vinci managed to give a phantasmagoric note to the real elements. One of his ideas was to repel sieges by crank-operated systems capable of pushing stairs from besieged walls. This idea also had an emergency solution, in the event that the enemies managed to climb the walls: a kinetic mechanism consisting of metal blades was to decapitate the soldiers on the ramparts[24].

An alternative to the war cannon was the ballista, an oversized mobile crossbow. Da Vinci's drawing shows the size of the mechanism relative to human height. The sketch is accompanied by the method of operation of the mechanism connected to an arc[25].

In one of his letters to the Duke of Milan, Ludovico Sforza (1452-1508), Leonardo da Vinci wrote that he could conceive armor-covered war chariots, safe and invulnerable, that could pierce the enemy defense with the artillery provided, which no company of soldiers will be able to stop. Behind them, infantry could follow without loss of life.

The project, which after four centuries would become one of the most used military technologies, started from the simple idea of protecting the interior of chariots with a carcass. Unlike the proposals of other military engineers, Da Vinci's version is notable for the fact that it did not need to be pulled by horses, because it operated independently.

The assault device with wooden pedals and cranks was equipped with 36 cannons placed on the entire circular surface, covering 360 degrees. The interior could accommodate 8 soldiers and was protected by a wooden shell covered with metal plates, in a conical shape, designed to deflect enemy projectiles.

The circular ground surface of the vehicle was covered with spears, like the Macedonian phalanx, to obstruct any cavalry offensive. All the details were thought of by Da Vinci at project level to create a complete and indestructible machine of offensive force, but, for various reasons, this project was not realized. Years later, it turned out that Leonardo's proto-tank could not be put into practice due to lack of maneuverability[26].

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[24] Allison Lee Palmer, *Leonardo da Vinci: A Reference Guide to His Life and Works*, Rowman & Littlefield Publishers, Lanham, Maryland, 2019, p. VII.

[25] Matt Landrus, *Leonardo da Vinci's Giant Crossbow,* Springer Publishers, Berlin, 2010, p. 45.

[26] Maxine Anderson, *Amazing Leonardo da Vinci Inventions: You Can Build Yourself,* Nomad Press, Vermont, 2006, p. 108.

Fig. 3. Author: Leonardo da Vinci (1452-1519) / title: Design for a battle chariot / technique: drawing on paper / year: about 1500

The multidisciplinarity of the illustrious humanist, his appetite for engineering, architecture, literature, painting or anatomy is captivating.

One conclusion of the above is that through the technical valences they could borrow from art, mechanisms have captured people's attention since time immemorial, so we will find countless applications of them throughout history. The artist-engineer had to repeatedly resort to solutions to combine art with the exact sciences, especially mechanical physics. Thus, countless mechanisms and devices were created, in principle intended for shows, which, however, began to acquire their own aesthetic autonomy today. Following the fiction, the simulation of the mystery or the fantastic, the artist could present the technical mechanism as a work of art.

This extensive process flourished with the technological leap, respectively since the generation of continuous motion was no longer a major problem. The limits initially imposed by gravitational attraction, spring tension, the use of physical properties, the use of hydraulic or wind energy, fell with the advent of the engine and electricity or liquid fuels. Mechanisms that do not instantly deplete the energy taken from the source have thus become a medium for art.

When we refer to technology and science, according to scientists and philosophers, we will inevitably associate these terms with the real and the palpable. For this reason, the scientific environment could not be associated with the arts until the modern era.

A first-rate desideratum for the art creator was the framing of his work in the area of aesthetics. This need to access beauty has been and will remain an indispensable concept for both the artist and the art lover. From an etymological point of view, the term “aesthetics” comes from the Greek word "aisthesis" and refers to the perception, sensation and sense that the soul has of the inner and outer world. According to the dictionary definition, the aesthetic attitude is a species of human attitude in general, seen as a mental complex of beliefs, values and dispositions present in any behavioral act, complex correlated with objects and facts that possess a certain emotional (artistic) load and that are lived in a personal and individual experience.

The direct or indirect use of the natural model in art has generated two artistic routes, if not antagonistic, at least distinct. The “artificial beauty” represented for example by *The Night Watch*, painted by Rembrandt, the *Symphony No. 5* composed by Ludwig van Beethoven, the play *A Midsummer Night's Dream* written by Shakespeare, or the novel *In Search of Lost Time* by Marcel Proust, is a distinct route compared to that of “natural beauty” (for example, the sunrise captured by Monet in his famous work).

The basic idea of this essay is that, regardless of the form that art takes, what matters is the truth found in the very laws of composition of each field of artistic expression. Aesthetics does not automatically exclude functionality, being at the same time independent of it, as well as of the natural model.

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Fig. 3. Author: Leonardo da Vinci (1452-1519) / title: Design for a battle chariot / technique: drawing on paper / year: about 1500
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