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Synergy of traditional graphic and digital matter

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Introduction / reminiscence

It was a warm day of summer. Walking on the gritty gravel, along the monumental facade of the building, I arrived at the narrowly ajar massive doors. They were large, heavy, made of solid wood, wrought with bulky iron. Inside the huge hall there was a pleasant chill and a slightly sleepy atmosphere of bygone eras. I found myself in the Museum of Art History in Vienna.

Inside were numerous artifacts from different eras and artifacts that were historical documentation of the mastery of the craft. Among the polished knightly armor, swords engraved with the greatest reverence or Egyptian altars covered with hieroglyphics, my interest was caught by the fruits lying on the platform. Two apples and a pear. They gave the impression of having been recently picked from the tree, juicy, sweet, swollen and browned from the sun. Why did someone put them here? Walking closer and reading the description, I learned that they were made of cold marble.

Perhaps at the Habsburg court they were mixed with real fruit for a joke and were thus used to fool and entertain guests at princely festivals, or simply served as decorations. This has not been written. However, I found particularly interesting a completely different fact, not directly related to their history. I was interested in man's slumbering desire to match nature, to draw from it to produce his own unique artifact. The artist wanted to immortalize his own creativity, and the use of a sturdy, even indestructible material, is a testament to this.

Heading further, steered almost automatically, I come across a group of paintings hanging on the wall. "Arcimboldo - *Summer* (1562)". - a portrait of a man made up of vegetable shoots, leaves, ears of grain, ripe vegetables and fruits. Once again, I find myself caught up in pondering. A still life? A portrait? What did the painter have in mind when making this painting? My interpretation fluently yields, as my eyes wander over more details of the scene pulsating with life. The title acts as a brake, immobilizing for a moment. Interesting...

Absorbed to the uttermost in the above dilemmas, I don't know when I returned outside, to the crunching gravel under my shoes. Exposed back to the greedy rays of the scorching sun. One of my first days in Vienna was just coming to an end. As a student at the Akademie der bildenden Künste, I would spend two more years there.

Introduction

The subject matter and scope of the research work undertaken within the framework of my doctoral dissertation is the result of the experience acquired during my own artistic practice and during my teaching work in the Photography III Studio at the Faculty of Graphics of the Academy of Fine Arts in Cracow. The subject of exploration, both artistic and theoretical, concerns the *Synergy of traditional graphic and digital matter*.

The present study contains a description and documentation of art issues important to me, oscillating between graphics, photography, object and virtual space and digital imaging. It concerns both manual and noble techniques of image evocation, as well as digital activities from the area of new media. I try to construct a statement by juxtaposing two seemingly disparate worlds (material - virtual). An important point, the axis of my considerations, becomes the possibility of combining techniques and their synergy.

I treat light and the influence of the sun as a causal, building, life-creating factor, but also destructive and destructive. Radiation also takes part in the process of creating photographs, brings them to life.

I illustrate my research with a set of art works entitled *On the Way of Light*, included in this dissertation, and this theoretical paper. The presented works are the crystallized result of experiences embedded in me over the years, coming from various fields of my activity - both artistic and teaching. In the written work, I describe the path I have traveled and point to the events that shaped me.

Synergy

Confronting classical art printmaking and trying to place it in contemporary realities involuntarily directs me towards digital art. Today, artists reach for tools such as 3D printing, drones or VR (virtual reality) glasses as often as they reach for looms and canvas, paint or clay. Artistic expression has taken on a broader context and often consists of multiple techniques or media. Technology helps artists realize their creations and supports them in expressing ideas in ways that were not possible before. Digital art has greatly expanded the range of artistic tools available, and has also revolutionized the way artworks can be created, distributed, and viewed. Instead of using a paintbrush, we can now paint with light, sound or pixels. Instead of a physical, two-dimensional canvas or paper, we can create three-dimensional graphics, holograms or virtual worlds displayed on electronic screens or projectors. Multidimensionality and combined media in today's reality is an unforced continuous process, successively progressing. From the perspective of my own experience as well. It is a process related to deepening my own interests and skills. I naturally feel the need to reach for a new medium and expand my own workshop, accompanied by a kind of excitement about the expedition to the "unknown land." Thus, meticulously supplementing my workshop, I search for tools and means of expression that are adequate for me.

The boundaries between different worlds do not have to be removed, and different spaces do not have to be matched in terms of perspective, scale and lighting; individual layers can retain their own characteristics instead of merging into a coherent space, different worlds instead of forming a coherent universe can clash semantically.[1]

The title concept of synergy can be understood literally, following a fairly general dictionary definition, as "the interaction of various factors, the effect of which is greater than the sum of individual separate actions" (PWN Dictionary of Polish Language). A very universal definition, testifying to the considerable semantic capacity of the term, informing of its application in many fields. In psychology, synergy is understood as the effect of organized team activities. In economics - as the implementation of multiple projects simultaneously, with the aim of increasing profits. In chemistry, where it means the state when, as a result of mixing together specific substances, their action is enhanced, or in science, when information gained from multiple independent sources yields more substantive content.[2] In theology, synergy is understood as the cooperation of human nature and divine grace. The term comes from Greek and is a conglomeration of the Greek words σύν (sún) "together" and ἔργον (érgon), meaning "work" or "action."

Each of the interpretations cited for the definition of synergy refers to its positive aspect. Thus, in the interaction of specific factors, we want to see a benefit, a new, better quality. A positive effect, impossible to achieve in any way alone. In the context of my own explorations

[1] Lev Manovich, *Language of the New Media*, translated by. Piotr Cypryański, Warsaw 2006

[2] Michio Kaku, an American-Japanese futurologist, in his book *Visions, or How Science Will Change the World in the 21st Century* (1997), posits the synergy of quantum mechanics, molecular biology and computer technology in science.

and artistic activities, I use the term synergy and apply it to creative, creative activities. I find the benefits of this.

In my activities, I am naturally interested in the "in-between" of media. It's a place sometimes quite difficult to define concretely, in addition, it's a moving place, changing fluidly depending on the choice and set of media. Something, as in the case of a shadow border, which sometimes can have a sharp definite line, at other times is stretched in a wide lazy gradient in a moment. In the case of synergy, the basic difficulty is that it is difficult to precisely predict its effect and when it will occur. For me it is a concept, a way of seeing in art - I understand it as synonymous with inter-multimedia.

In my dissertation I focus on the dilemma and certain differences arising from the characteristics of a particular medium and the smooth flow and blurring of these worlds. It is about the points of contact of different techniques in different media. I am not looking for contrasts and distinctions. Rather, I am concerned with a kind of contact points, edges that do not separate anything, are not a barrier, but an important link. They are places that weld together two seemingly separate planes. American architect and urban planner Kevin A. Lynch, in his pioneering book *The Image of the City* (1960), defined edges as a point of exchange, a place where the two urban areas intermingle. This type of understanding of the term "border" is close to my beliefs as well. It acquires a deeper meaning and significance especially in the context of the subject matter undertaken here. I want my works to complement each other through juxtaposition.

The need to understand art in a broader cultural and media context is a task as well as a challenge of modern times. Fortunately, we have developed the skills to read contexts, perceive phenomena and relationships along with all the important and those less important details. This definitely facilitates and sustains the fluidity of understanding and avoids unwanted confusion.

The statement, especially with regard to art, that combining media enriches artwork seems quite clear. Behind new discoveries is most often the desire to experiment, to search for a new quality and the need to look further than others. Artists are eager to reach for new media, experimenting with them, trying to use their potential in a creative way. The same is also true in my case.

The collision of art and science is not something new, we observe it continuously. By following history, we can see how strong the connection between them is. I automatically think of the example of Leonardo da Vinci and his investigative approach to the essence of each thing. Throughout the centuries, observing the constant development of technology, we constantly witness the absorption of new acquisitions of science by the field of art. Art and science complement each other. The constant development of technology favors art, thanks to it new tools and ways of presenting works are created. On the other hand, artists - with their bold, unlimited visions - pave the way for further scientific discoveries. An excellent showcase and example of the ever-growing mutual interest between the two fields is the annual Ars Electronica festival of art, science and computer technology held in Linz. The works presented there from the borderline of these two disciplines permeate each other. Bionic hands controlled by an algorithm based on observation of the behavior of a flock of birds, artificial intelligence composing a musical overture or a man with a chip implanted under his skin, thanks to which, despite being a daltonist, he can distinguish individual colors.

The examples are many, and successive editions present the latest developments in this field, invariably surprising viewers; transcending previous ones and charting new frontiers of cognition.

Art and science are separate fields, but derive from one trunk - action, discovery and creation. I dare say that in every creative artist slumbers a scientist who wants to touch, try, experience, explore, turn everything upside down. The scientist, on the other hand, has some part of the disposition of an artist, a sensitive individualist following his own paths, disregarding others and breaking the accepted rules. Both try to tame and understand reality in their own unique way, using their observations and experiences to do so. Together they have a strong influence and power to shape our culture and civilization[3]. These types of individuals, I will mention them in more detail later, manifesting the creative attitudes described above, have a significant impact on me, while inspiring and stimulating me[4]. Below I also list important concepts, currents and currents combining art and science, strongly related to my beliefs, influencing me with varying intensity.

After all, such an exercise of imagination does not merely discover "art," but also knowledge. To perceive metamorphosis (as Leonardo da Vinci repeatedly did) is evidence of cognition, and in turn all knowledge is bound up with the classificatory order; to enlarge, or quite simply to change knowledge, is to experiment by daring operations that subvert the classifications to which we are accustomed: such is the noble function of magic, "the sum of natural wisdom" (Pico della Mirandola).[5]

Biomorphism - natural and biological forms

Biomorphism in art, despite its distinctive visual language, which can be recognized quite easily, has not been directly included in the set of categories describing artistic phenomena. It refers to knowledge of all types of living organisms and their structures or construction. However, we can see how it escapes clear-cut classifications and seeps into various artistic tendencies or individual works. It should not be considered as a unified trend. Rather, we observe it on the margins of art, including contemporary art. - Which, from my perspective, makes it all the more interesting. After all, on the margins we can always add something, add something, circle something.

[3] Paweł Fiłonow, a representative of the Russian avant-garde, recommended the "persistence of the master-researcher": the artist must study "all the features of the object, the phenomena of the whole world, the phenomena of human processes, both visible and invisible to the naked eye" (*Deklaracja Rozkwitu Światowego*, 1923).

[4] Alois Riegl saw the role of the artist as an explorer of nature, who, while thoroughly studying it, even in a scientific way, at the same time contradicts it, through processing and creative actions. Such a dialectic was used, for example, by Picasso

[5] Roland Barthes, *Retore e mago*, [w:] *Arcimboldo,* tłum. Iwona Maria Malec, Estetyka *i Krytyka* 15/16 (2/2008–1/2009)

We don't want to imitate nature. We don't want to reproduce, we want to create just like a plant that creates fruit but doesn't reproduce it. We want to create directly, not indirectly.[6]

Not so long ago, looking from the perspective of art history (at the end of the 18th century), the idea of a conventional division into living and inorganic matter, that is, that which is devoid of life, was put forward. The organic was supposed to refer to movement, development, production and growth, while the inanimate was associated with static and death. This is a very important distinction, which was later to entail specific connotations in relation to art and creative activities.

The turn of the 19th and 20th centuries is characterized by a growing fascination, evident on many levels, with soft, rounded forms drawn from nature and the biological world. The range and diversity of these interests is so wide that it is difficult to make a precise classification. Therefore, I focus only on its fragment, which concerns art and cultural discourses. The experience of nature is being vascularized. During this time, numerous works are created that force the viewer to question his own perception of reality. This is a time of deep conviction about the close connection between science and art, biology and physics, or the commonality of discoveries in mechanics and technology. It is a moment of the formation of a new knowledge of nature and the role of the new man in light of the dynamic development of sciences, not only natural sciences.

It's a time when more discoveries in biology confirm that humans belong to nature. This is also the phase of increased interest in naturocentric or biocentric views and the popularity (Henri Bergson) of the biological hypothesis of vitalism, an immaterial force (French: *élan vital* - " vital impetus ") that guides life processes. A perverse force, escaping testing or empirical research, questioned by proponents of the laws and concepts of mechanics; an immaterial momentum found in every organism, responsible for the evolution and development of living beings. Vitalism, which did not abandon the formalism of abstraction, gave it a dynamic and biological style. Attention was also focused on immaterial chemical or biological forces (e.g., the ether that can generate the fourth dimension). The idea of movement, of evolution from simple to more complex forms, is evident on many levels. Each element of reality follows from its more simplistic predecessor and seeks further transformation.

The term biomorphism[7] itself was popularized rather late, only with the director of New York's Museum of Modern Art Alfred H. Barr and his diagram (published in the catalog: *Cubism and Abstract Art*, 1936). To show the two new tendencies emerging in the wake of Post-Impressionism, the New York exhibition distinguished between biological and geometric works[8]. On the basis of this simple division, further oppositions were built (wavy - rectangular, emotion - intellect, romanticism - classicism). The aforementioned chart played a

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[6] Hans Arp, *Konkrete Kunst* (1944), [w:] *Unsern taglichen Traum*, Zürich 1955

[7] The term "biomorphism" was first formulated by biologist and anthropologist Alfred Cort Haddon (decorative natural forms), and was introduced in America by Lewis Mumford in his work *Technique and Civilization* (1934). However, for the purposes of art, it was adapted by Geoffrey Grigson (the transition from representation to sign-making; he divided art into geometric, intellectual and creative, relating to life).

[8] According to Barr's diagram, one branch of development leads from Cézanne to Cubism, the other from Gauguin, Matisse and Kandinsky to Surrealism. ("We now have a confrontation between the shape of a square and the silhouette of an amoeba.")

significant role in the discourse of the time regarding the future of art, but just as quickly there was a criticism of such general distinctions. The fight against naturalism and the affirmation of abstraction were not enough, leaving the question of man's place in the world still unanswered. The intricate web of meanings and connections that is art was suddenly simplified and gathered into two separate collections. For Meyer Schapiro, who has attempted to explain this phenomenon as the next stage in the development of art[9], the emergence of abstraction will not be the result of a sense of inadequacy and helplessness in trying to represent the world. It is not frustration resulting from the lack of appropriate means of expression, but political, social or material conditions that are capable of determining even the most radical creativity. Rather, Schapiro saw in the emergence of the phenomenon of biomorphism a breakdown of the machine-like pattern of art in the context of the general mood of the global crisis (1929). Do we not have a similar feeling today? One can pose this question. Doesn't the interest in these topics come from similar motives?

In addition to these dilemmas, an apparent split over visions of the future also emerged during this time. On the one hand, nature was seen to be organized biomechanically, just like our lives. The other concept assumed a more naturalistic model of man, in which there is a complex organic unity of the whole world.

A special figure today, fascinated by the organic world, was Ernst Haeckel, a scientist, researcher and graphic designer. Captivated by the beauty of nature, he observed and created thousands of sketches of the life of lower forms of marine animals. His works, rich in form and full of detail, depicted crustaceans, fish, corals, plankton, twisted shells, mollusks or carnivorous plants in a way never seen before. He later turned his scientific observations of underwater life into graphic works. With one eye he would look through a microscope at a specimen of a protozoan fished out of the sea, while with the other he would closely inspect the sheet of paper on which he was sketching. His enthusiasm - not only scientific, but also creative - ultimately contributed to the creation of a first-of-its-kind dictionary/atlas of biomorphic forms, which still captures the imagination and inspires generations to come. The album *Kunstformen der Natur* (1904) consists of one hundred color lithographic charts depicting extinct and living creatures and their descriptions. The charts are not just an artistically appealing documentation of a scientist, they have become evidence of the diversity and complexity of life, and reflect the harmony of the world. In doing so, they acquire a philosophical dimension. "God reveals himself in all creations of nature," Haeckel writes in his diaries, seeing precisely in nature the realization of the canon of Plato's ancient aesthetics: the beauty of goodness and truth. (The beauty of nature, the truth of science and the good resulting from progress). The beauty of art is shaped after the beauty of nature. As a doctor, he taught comparative anatomy, fascinated by Darwin's theory, he was convinced of the commonality of all living organisms[10]. He believed that although humans are mortal, something of them remains in nature.

In Poland at that time, the above dilemmas were far less popular, and were approached from a distance. During this period, the creative attitudes of individual artists and the characteristics of entire art movements were complex, different, depending on the center in which they were born and developed. And although the works were formally consistent, the theoretical

[9] Meyer Schapiro, *Nature of Abstraction Art*, „Marxist Quarterly" 1937

[10] Forerunner of German eugenics. Formulated the theory of recapitulation; biogenetic theory, developed by Friedrich Muller and completed by Haeckel in 1866

assumptions often diverged[11]. Certainly, important to all was the active relationship between the artist and the environment. The overriding goal became that of the creative artist to strive for the integration of art and life, humanity and nature.

Superorganism - every element has meaning and purpose

Fascination with the mechanics of nature, the complexity of the processes in it, sensitivity to the pulsating universal element and all stage of life become an inexhaustible source of inspiration. In creative activities, which take on increasingly abstract forms, one can see a constant search for the full homogeneity of the world. A spiritual and holistic understanding of the world becomes paramount. For Kant, a work of art will be understood as an artificial organism, developing instead organically, that is, according to scientific and biological laws.

Haeckel's thought - "everything came out of water" - has a stimulating influence on many thinkers formulating their doctrines, including practitioners building a new visual language.

Everything came out of the sea. Organic being originated in the sea, the first cell was formed there, and from there came out the entire animal and plant world, which through evolution took its present shapes. The sea is the source of being and the amoeba is the starting point of all further complications of one and indivisible being.[12]

The artwork is intended to evoke impressions similar to those of mathematics in the viewer. In the formal construction, as well as in the creative attitude itself, there was an attempt to perceive general laws, the order found and recorded in nature. However, it was not about pure resemblance and imitation of nature - mimicism[13]. Importantly, what then becomes important is the potential not only of the individual, but also of the collective. What matters is the community of all forms and their interaction. Thus, the structure of the work built on the model of a living organism - a superorganism - also became important. An organism that, in the process of evolutionary improvement, is constantly transforming itself, rather than stagnating in one particular (satisfactory) shape. Built from many smaller ones, it forms a whole with a much greater power of influence. Such an organism was supposed to elude all modules and schemes. This was to be evidenced by its efficient structure, in which each

[11] In 1922, two congresses are held in Germany: The International Congress of Progressive Artists and the Congress of Dadaists and Constructivists. Representatives of De Stijl, Dada, Bauhaus and Russian Constructivism meet - with the aim of unifying trends. Assemblies of artists of the European avant-garde, were to internationalize art and create an understandable universal style. They ended with Werner Graeff's words: "I am probably the youngest of you all, and I have come to the conclusion that you are neither international nor progressive, nor are you artists."

[12] Władysław Strzemiński, *Aspekty rzeczywistości*, 1936, s. 10

[13] A term used mainly in biology in relation to animals and plants, as imitation, resembling. In art it is understood as copying reality.

element has its own task and importance, and the functioning of individual parts depends on the whole[14].

The issues themselves have not lost their relevance. The design of nature, the impact of technology or the search for spirituality or ethics based on the philosophy of nature, the possibilities of engaging industry while being aware of the risks of this to the environment. These are just a few of the many topics that are still relevant today.

Behind this nature metaphor is a palpable tension between the autonomy/individual and the collective. The secret to the success of such a super-unit seems to lie in the appropriate division into specific functions.

Imitating the machine is as harmful as imitating the animal world. Both interfere with the development of pure plasticity and abstract form.[15]

If it was a cheek, what would it be? - Peach. "If it was a collar?" Ears of ripe corn. If it was an eye? - Cherry. - I already know: it's Summer.[16]

The story I mentioned at the beginning of the work is an event worthy of special attention for me. A few years after that visit, in retrospect, I see it as worth noting. Especially in the context of my own artistic work and the creative path I have gone through so far. While in Vienna, I was in an environment where there is a holistic worldview that maintains the connection of all forms of life and an organic approach to art. The unlimited potential of the natural world and its utilitarian character are noticed in creative contexts. Emphasis is placed on the importance of the natural sciences and issues related to the nature of the human soul. The "meeting" with Arcimbold stimulated previously hidden processes of deepened consciousness in me. Not only considering the way of decoding the language of art, but also in the process of constructing one's own artistic expression, while building a conscious language of visual expression. A meeting that I didn't realize at the time. Was there supposed to be a deeper, universal meaning hidden in the slightly playful procedure and in the skillful hand of the Italian painter? Can a few marble fruits contain a greater load of meaning? My discoveries did not reach me directly, only over time they gained strength and importance. The seed had been planted, but I was to find out about its yields much later, when I was back in Krakow. My interests began to circle more and more closely around biologism and organic forms. And the visual language began to take a more synthetic form. I am beginning to see the

[14] Nikołaj Kulbin viewed nature, a single living organism composed of organic and inorganic forms, as such an organism (*Czuwstwitlielnost*, 1907).

[15] Katarzyna Kobro, Odpowiedź na ankietę, ABSTRACTION–CRÉATION, 1933, nr 2, s. 27

[16] Roland Barthes, *Retore e mago*, [w:] *Arcimboldo,* tłum. Iwona Maria Malec, Estetyka *i Krytyka* 15/16 (2/2008–1/2009)

deep complexity of nature and its connection with civilization. I am interested in the art of modernism, deeply marked by inspirations drawn from nature. All this, however, expanded with new media and modern technological possibilities.

Arcimboldo, using in his works forms of natural origin (plants, animals, mushrooms) creates his own language, a code that only after deciphering shows us what is hidden inside. He carefully conceals messages intended to be read. The famous portraits, meticulously worked out in detail, unleash the imagination and give birth to a series of associations. They guide us so that we are able to see the overall meaning of the work through the shared meaning of separate, small details.

French writer and cultural theorist Roland Barthes calls the Italian mannerist's paintings "moving." The paintings, overflowing with fruits, vegetables and shoots of vines, swirl and pulsate in the viewer's eyes like living organisms. However, despite the life throbbing inside the paintings like an anthill, the author looks for movement somewhere else, on the part of the viewer. "Arcimboldo's paintings are moving: in their intention, they force the viewer to move closer or farther away, while assuring him that in this movement he will not lose any of the meaning and will remain constantly in living contact with the painting."

It's not about an optical illusion or an illusionistic trick, but about a change of vision that, as a result, shows us a different, new sense/context. Rather, it is about a movement of the intellect that leads the viewer away from a single shape.

As Barthes notes, what conditions our aesthetic experience is the cultural aspect. The constant, civilizational context of the work becomes important in reception.

In all the richness of meaning and vital references, there is also the theme of vanitas. Exceptional energy and movement conceal the truth of inevitable decay. This is evidenced by their biological nature. Full of life, the blushing portraits inform us of the inevitability of death and the destructive process of dying. In all the portraits we can perceive "bodily infirmity", "swarming". Faces covered with fungus are subjected to the process of decomposition. A comforting fact is the staggering cyclicity of nature, which is reborn anew.

Arcimboldo's heads are terrifying because they all refer, whatever the charm of the allegorical subject (Summer, Spring, Flora, Water), to the ailment of the body: swarming. The mixing of living objects (plant, animal, children), chaotically crowded (before they reach the clarity of the final form) evokes the whole of larval life, the entanglement of plant beings, worms, embryos, viscera that are on the verge of life, not yet born, and already subject to putrefaction.[17]

In my interpretation, the causative factor that Barthes does not mention is the sun. It awakens to life, development, gives energy, but is also destructive.

[17] Roland Barthes, *Retore e mago*, [w:] *Arcimboldo*, tłum. Iwona Maria Malec, Estetyka *i Krytyka* 15/16 (2/2008–1/2009)

sun > light > life

Of all the natural phenomena occurring in nature, the sun and its radiation are of particular interest to me. Not only for purely visual, form-creating reasons, but also because I find references for it in my conceptual assumptions.

The sun, as a huge glowing ball of gas and plasma, emits powerful energy in the form of heat radiating in all directions. In many ancient cultures it was considered a god. Identified with a supernatural creative force, it played a significant role in beliefs and religious practices, and became the object of unique human worship. A symbol of creation, renewal and divine power, it was also associated with the cycle of life and death (east and west). From the beginning, man was aware of its unique influence on him and the reality around him. It provided the heat and light necessary for growing crops, influenced the harvest, and its cyclic movement determined and stabilized the rhythm of life, work and rest.

Solar energy is the initiating factor, it is at the beginning of the chain of many life processes. Light regulates biochemical processes, influences the water cycle on the planet, affects living organisms and the functioning of cells. It is the "fuel" of animate matter. It drives numerous processes, including photosynthesis; as a result of these reactions, oxygen, essential for the preservation of life on Earth, is released into the atmosphere. Without radiation, life on our planet could not exist as we know it. If the sun suddenly disappeared, the Earth would fall off track in the planetary system, ending in a cosmic catastrophe.

As a key component of the ecosystem, the sun provides a number of benefits, but it also carries many destructive effects and risks. Long and continuous exposure to UV radiation contributes to permanent damage to cells, tissues, DNA and RNA, proteins. The risk of cancer is increased, aging processes are accelerated. On the other hand, the absence or deficiency of the sun and its radiation leads to a decrease in energy and deepened apathy. Numerous studies show that without light, living organisms can not function efficiently[18]. Solar energy also affects chemical processes in the brain (such as the production of vitamin D or serotonin). There is no doubt that we depend on the sun and its effects.

In the sense that interests me, the sun also conditions the processes of our vision, as it affects our visual experience. This happens through light radiation, which acts on the main receptors located in the eye. The visible light emitted by the sun enables us to see and distinguish individual colors[19]. Colors affect human perception, mood, cognitive and emotional processes, they can stimulate, cause sadness or joy. Color symbolism is often interpreted in relation to the relationship with the elements of nature. These are universal associations (red - fire, yellow - sun, blue - sky, water, green - nature). Color impressions are subjective, and no measurement can reflect the sensation of color by a particular person. Despite this, knowledge of the effect of colors is effectively used in many fields, by marketing specialists, designers or as an apparatus for diagnosing the emotional state of patients.

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[18] In 1980, a special disorder called Seasonal Affecitve Disorder (SAD), associated with sun deficiency, was identified. It was named and described by Dr. Norman E. Rosenthal and his colleagues at the National Institute of Mental Health (NIMH).

[19] Johann Wolfgang Goethe, considered the first color psychologist, classified all color impressions according to their effect on humans, distinguishing between effects on the body and effects on feelings (*Nauka o barwach*).

We easily recognize objects subjected to too much UV light. We associate them with something old and send them back to the past. The scorching sun makes vivid colors fade, materials evaporate, ripe fruits lose their firmness, and skin wrinkles and sags. Some substances blacken due to sun exposure[20].

Medieval alchemists were well aware of the so-called hellstone, or silver nitrate. Objects rubbed with it turned black, and it was used in medicine for germicidal reasons. The photosensitive substance used in photography is nothing more than a suspension of tiny silver halide crystals. The particles break down under the influence of light falling on them, darken, forming an image composed of millions of such dots, not yet visible to the naked eye, the so-called latent image. Thanks to portions of solar energy, reaching the sensitized surface in varying amounts, we can record images of reality. In this swarm, a structural "anthill" of particles, the image of the world is recorded and fixed.

It is worth quoting the words of the Polish precursor of photography at the beginning of the 20th century, and also a painter and graphic artist, Karol Hiller: "In nature, the densities and dilutions of matter, in the form of dark and light spots (...) are the result of the wave motions of light, sound, electricity, magnetism and the forces of earth's gravity. We can reproduce similar conditions existing in nature on film (...)."[21]

Gazing at the phenomena occurring in nature, I like metaphors in which the shadow covers something, hides it from us, while the light shows, illuminates, brings it out of the darkness. Subconsciously, we are more willing to walk towards the light than into the depths of (some) darkness. We feel more comfortable wrapped in the sun's rays than shrouded in darkness. I often use this kind of reasoning during my art activities. Particularly evident when working on graphics and photography (matrix, mask, stencil, film). It also becomes important for me to see through the contours, the falling shadow of the object and its subsequent afterimage.

Media Areas:

1. Bio-item/bio-object

Nothing in modernism destabilized the viewer's rational imagination more than surreal objects and installations. Forms and shapes, inexpressible only in words, arouse interest, efficiently overcoming misunderstanding[22]. Important ideas and doctrines crystallized around such artifacts at that time. I believe that it is in them that the biological imagination is released the most, showing its full potential. Objects can trigger deep associations, often at the same time undermining already established lines of thought[23]. What is real intertwines with what is imagined; what is alive with the dead, and what is dead comes to life. Objects undergo a metamorphosis, change their meanings. An ordinary item can become unique - and vice versa.

[20] Johann Heinrich Schulze discovered in 1717 that some silver salts darken when exposed to light. Interestingly, this precursor of photography wanted to invent a substance that, when exposed to sunlight, would accumulate light and then glow in the dark.
[21] Karol Hiller, *Heliografika jako nowy rodzaj techniki graficznej*, „Forma", 1934.
[22] Freud: an object is a manifestation of inner human desires and aspirations.
[23] The Man Ray, *bottle dryer* presented in 1936, or the Meret Oppenheim, *Cup* (1936) are a perfect example of this.

The aquatic environment was considered the natural source of all life hence many references to aquatic forms.[24]

The psyche recognizes something indefinitely close in the strangeness of the uncanny and something vaguely disturbing in its apparently familiar form.[25]

A special case are the works of Hans Arp, who comes from Dadaism. This is another important artist in the construction of the analysis of my theoretical work. Associated with many groups, yet separate and individual. In his activities, he combined the Dadaist case with the flowing softness of surrealism, showing the natural naturalism of the form, seeing and showing the world around him in a continuous process. Starting from the observation of nature, however, he tried to free himself from object associations, so that only the superior order of everything remained visible. His actions were seen as breaking away from geometricism, building a different aesthetic. As Brzękowski wrote about him, "Arp's invention is the introduction of new irregular forms in sculptures and paintings. They have something of a flattened sphere or a cell dividing under a microscope"[26]. He was later called the inventor of a-geometric sculpture, which reveals new faces from every side. The oval and oval shape visible in all his works will become his starting point, the pre-form[27]. Biological - soft and alive - the line refers to the beginning of life on earth. What is objective will be humanized. Breton, describing Arp's work, spoke of "ongoing transformation", of "the constant struggle of creative and destructive forces that struggle for true reality and true life." Its biological shapes enhance the feeling of ambiguity and mystery, show a world that is somehow familiar to us, strange and alien at the same time. In the case of a sculpture, light is an important factor that "awakens" it fully to life. By illuminating objects, he shows their shapes, forms and models, brings out their spatiality. It brings out the nuances, allows you to see the details of the texture. Spatial objects covered with rays cast their shadows, outlining their contours on a flat two-dimensional surface. In this way, a sketch is created, a profile outlined by light.

According to the Greek legend[28], this is how drawing was invented - by tracing contours projected by man onto a smooth surface. An object subjected to such analysis, according to the French philosopher Edouard Pontremoli, is "a reflection that is the starting point for knowing things."[29]

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[24] Later works by artists such as Kantor or Szapocznikow focus more attention on matter, but already in the process of decomposition, dying, losing life. It was about the degradation of biological matter, even causing a sense of repulsion and disgust.

[25] Andrzej Turowski, *Biomorfizm w sztuce XX wieku*, Gdańsk 2019

[26] J. Brzękowski, *W Krakowie i w Paryżu* (wspomnienia i szkice), 1968

[27] Contemporary sculptor Tony Cragg sees in his works a cumulative charge of autonomous energy, emotions contained in the form and solidity of the material.

[28] An ancient Greek legend about the origins of drawing, cited by Pliny the Elder in his Natural History (a Corinthian girl, knowing of an impending breakup, outlines the shadow of her beloved's profile in charcoal on a wall. On this outline her father Butades later modeled the young man's face in clay, immortalizing his beautiful countenance. This is how she saved herself from losing him).

[29] Edouard Pontremoli, *Nadmiar widzialnego: fenomenologiczna interpretacja fotogeniczności, 2007*

Graphics - shape, stencil, mask

From a more scientific point of view, confirmed by the discoveries of archaeologists, we know that the need to reproduce drawing motifs has been embedded in the nature of man since the beginning of his conscious existence. The repeatedly reproduced outline of a hand, treated as a stencil, appears in many ritual images. Scratching a permanent image with tools into a susceptible material is one of the oldest "artistic techniques."

The first graphic prints can be described more as utilitarian activities. However, this fact never prevented graphic art from being at the same time a technique deeply embedded in the world of fine arts. It quickly gained independence as a special work of art, and played an important role in the dissemination of culture, as it illustrates ideas that cannot be described by text. Only for a moment did it cede its position to photography. From today's perspective, however, we can see that both techniques have found their tracks, freeing themselves from purely reproductive functions. Noble graphic techniques, despite the passage of time, have not lost their freshness, constantly evolving and transforming their language of expression.

Following the work of Jozef Gielniak, it is impossible not to observe floral inspirations (botanical, biological) derived somewhere from Art Nouveau or ornament. The structure of the painting, like a rippling mosaic, affects the viewer, like an image viewed under a microscope. In his prints, in addition to his fascination with biology, I sense a kind of intertwining. Nature becomes fused with the product of man - architecture - greedily absorbing and taking over these objects. This is what the artist wrote in one of his letters: "It was serene, I was laying down on the grass, listening to it grow. And suddenly something strange happened. I found to my surprise that the grass was growing enormously in my eyes, becoming menacing, obscuring the mass of the building, that this mass suddenly came to life, that everything began to enter into unexpected relationships"[30].

The matrices, cut with Benedictine perseverance, with incredible precision and sensitivity, become a collection of tiny compacting dots. The graphics - like X-rays - scan every smallest atom of reality, causing the impression of shattered matter, dense dust floating everywhere. At first glance, we see death and decay in the works. Understandably, given the artist's state of health at the time and his thoughts. However, it is enough to bring the face closer to the linocut, thus changing the perception slightly and seeing already isolated, autonomous blades of grass, shoots and plants. The graphics are teeming with their inner life, the plants are in bloom, greedily draping the building walls and fences. Maybe this is what nature is like: every tiniest atom is part of something bigger, and what we see in Gielniak's linocuts - a cyclical record of the process of life and death that we watch every day.

From broad observations - deluding us with their descriptiveness or not-so-difficult symbolism - we move on to detailed observations, confounding previous impressions, up to a microcosm of the finest elements, whose - at first imperceptible - world constitutes the proper content and density of the work. What can more closely reflect the nature of this work than the

[30] Gielniak about his graphic work *Sanatorium V*

Vistula whirlpool, on the surface heralded by the harmony of legible circles, and the more in depth - the more dark and death-like?[31]

While I was still a student, among the available workshop studios, the woodcut studio turned out to be particularly suited to my interests and expression. The crude, simple, almost coarse workshop, consisting of chisel, die and imagination was tempting. The parsimonious language eventually forces one to act decisively in the context of the construction of the image, and the cut-out fragment can no longer be completed so easily. A white trace resulting from the tool and the building of the form from the black intact planes of the matrix is created. The stroke of the chisel brings out the whiteness of the paper. Like a beam of light, it illuminates the contours of an object plunged into darkness. A play of contrasts is created, black or white, light or shadow. The result is a matrix, and on it a zero-one encoded image, simplified to information (white) or lack thereof (black). In the further process of synthesizing my actions, I use special templates, which I cut out by hand. I selectively decide where the paper will be masked - it will remain blank - or cut out - it will be printed.

Then began to find and explore the trend of biologism, the master's thesis was largely a summary of this. The above-mentioned issues are continued by me and expanded by further media in the practical work for my doctorate.

Mastering such a method of operation later led me to further experiment and work with photosensitive emulsion. Cameraless photography became for me a continuation of these graphic experiments, in this method I found the analogy of image building. I deliberately hide the fragments of paper sensitized with emulsion from the sun, using a mask or stencil, just as I hide the print from the pressure of the printing press roller. In my view, an intact matrix means no information, i.e. blackness. Similarly, sensitized photographic paper subjected to rays will give us full blackness. Only interference with such matter will give it life, encoding information, in a more or less complex/complex way.

Photography[32] - the spontaneous delight of the eye with the sun

In Western culture, the eye has occupied a status of honor from the very beginning, singled out and treated as the most objective sense. "The eye is less mistaken," wrote Leonardo da Vinci, clearly valuing sight as an excellent apparatus for acquiring knowledge about the world, observing nature and recording reality. With the development of the sciences, this view has gradually changed. Questioning only the physical properties governing optics, Johann Wolfgang von Goethe (*Theory of Colours*, 1810) questioned the objectivity of vision and its verifiability, seeing also subjective factors and individual psychological aspects in the process. Recognizing certain limitations associated with these dilemmas, artists in the Bauhaus circle felt the need to " a new way of seeing" and verify this knowledge anew. A machine was to prove helpful in this task. The human eye was supported by pure optics and

[31] Stanisław Grochowiak, *Sanatorium*, „Kultura", VIII, nr 43 (385), 25 X 1970

[32] photography - drawing by means of light.... The term comes from the Greek roots φῶς (phōs) - light, complement φωτός (phōtós) - light; γραφή (graphé) - drawing.

the mechanical-chemical registration of the camera. The photographic apparatus, after all, devoid of human over-interpretation and inaccuracy, was believed to be fully reliable and unbiased. Such a process was supposed to support and at the same time exceed the natural capabilities of the human eye. However, it became apparent rather quickly that the camera was another new tool for shaping visual sensitivity. Which, in turn, contributed to new dilemmas related to our perception and perceptions.

However, before this happened, as in the case of graphics, photography was at first not considered as a creative tool, for the invocation of art. It is a young enough medium that its non-artistic origins can be explored. The reluctant approach took not only from the fact of the automatic process of making an image. The purely artisanal nature of the technique is felt especially when studying the first photographic images. Through the mechanical process of recording an image, the camera was seen more as a scientific instrument. After all, the artist only operates the machine, while it is the machine that indirectly supervises the actual process of creating the image.

However, the above factors did not lead to a decline in the general interest in this method. The desire to record an image also stemmed from sheer delight in the new possibility of capturing reality - as we see it at any given moment. William Henry Fox Talbot, the English pioneer of photography, captivated by the new possibilities, will compare the camera to "nature's pencil" [33]. It has finally become possible to accurately capture what our eye sees, to record and, in addition, to reproduce many times[34].

Daguerreotype - is not only a tool that helps to draw nature (...) it also allows it to multiply.[35]

Photography provides us with factual evidence, rather than being an interpretation, early photographers will argue. It informs us of what was; it confirms events or denies them. We readily assume that something we look at in a photograph exists or once existed. The event in question took place, and here is proof of it[36].

Similarly, for the inventor of photography, the camera was something like a notebook, whose greatest advantage was its impersonality. It records the "real" image of the world as it is created only with light, without the interference of the artist. He understood the photographer himself rather as an operator.

However, when the first technical difficulties of the chemical process and the apparatus were mastered, there was room, albeit rather reluctantly, for more subtle purposes, thus giving

[33] Fox Talbot in 1844 published his first photography book, *The Pencil of Nature*.
[34] The first photographs taken by Daguerre led to positives directly on a copper plate. The resulting image was a single, unique one, with no possibility of duplication. It surpassed Talbot's method in terms of better detail and sharpness of the image. However, the development of photography came only with the replacement of this method by the negative-positive process. With the improved technique, the image was created on paper, and an infinite number of copies could be made. It was also quickly appreciated that a softer image lent itself to greater retouching possibilities.
[35] Louis Daguerre (1838, from a sales flyer)
[36] ccording to the observations of researchers of the issue (I. Płażewski, A. Rouillé, F. Soulages), for the first hundred years of its existence, photography mainly served to meet the primordial social needs in the cognitive and documentary fields.

room for the exercise and expansion of visual sensitivity. As Susan Sontag says: "When cognitive claims weaken, creative claims come to the fore."

Photographs are not only evidence of what is, but also of what the photographer sees, and his individual assessment of the world. This observation will lead to the affirmation of the existence of an activity related to "seeing" as a variation of the new human perception. So as to show something that everyone has already seen, but in a new and surprising way. Thus, a new door of exploration and experimentation was opened. A new and different perspective was sought. The camera is placed just above the head or under the feet of the model, close to the wing of a butterfly or pointed at the stars. It is worth noting that this time also overlaps with the rapid development of natural sciences. It became clear: the camera "catches" the reality found[37], but photography is also its interpretation, just like paintings or drawings. This discovery and the unleashing of the creative potential of photography, although it happened relatively quickly, did not ensure that the new technique was as quickly classified as a visual art. The medium itself, after all, does not establish art; it is merely a medium of communication. In this case, the camera mechanically records what physically cannot be repeated.

...a photograph is not only an image (...) an interpretation of reality, but also a trace, something reflected directly from the world, like a footprint or a death mask.[38]

In 1916 Paul Strand[39], fascinated by Cubism and European abstraction, takes close-up photographs of ordinary kitchen bowls arranged in an abstract composition (*Abstract pattern made by bowls*). This is a new perspective of photography, defining a new point of view. Alfred Stieglitz will state that the work is "brutally direct ... devoid of any attempt to deceive an unsuspecting public, including the photographers themselves." This approach shapes a new photography that analyzes the features of ordinary people and objects. Photography from now on approaches science as never before, thus proving that the world is beautiful regardless of the motive. The photographic gaze appears to be a practice of atomized looking. We have become accustomed as viewers very quickly to this state of affairs, even expecting such "deformation."

When the machine, having revealed its biological value to all, has won the affections of man, all it takes is a conscious will on the part of man to make it a factor of artistic beauty. This creative I want has been said. The machine was introduced into the field of art.[40]

The aforementioned Edward Weston considered the photographer's activity to be elitist, always in its assumptions revealing something new and unique. Showing the viewer images

[37] Services such as the military and police have been gifted with a useful tool for control and surveillance. (How much more will we trust the image of a criminal captured in a photograph than his memory portrait taken by an expert police portraitist).
[38] Susan Sontag, *O fotografii*, Kraków 2009
[39] American photographer who helped - along with Weston and Stieglitz - to establish photography as an autonomous art form.
[40] Tadeusz Peiper, *Miasto, masa, maszyna*, op. Cit., s. 25–26

that his eyes had not seen, revealing everyday reality - the kind we had not seen before. An outstanding example is Weston's 1931 photograph of a monumental close-up. The delicate, flowing folds of velvet drapery we admire are actually the withered leaves of a garden vegetable. The title becomes the key to a fuller understanding of this painting: *Cabbage Leaf*. With this treatment, the artist seeks to broaden the viewer's visual awareness. Also significant is the series of photographs of peppers, which depicts images of the vegetable taken at close range. The bell pepper, placed on a dark background in the center of the frame, with a strange anthropomorphic shape, gives the impression of a biological organism. We can find here references to the outlandish forms of H. Arpa.

Weston calls photography a way of self-development, a means to discover and identify with all basic forms - with nature, the source of life.[41]

For me, the most telling remains the photograph *Bedpan* (*Basen*, 1930). Weston wrote in his diaries that he might have called it "bird" (*The Bird*) or "princess" (*The Princess*). Not coincidentally, we find here the influence of Duchamp's "fountain" and his ready-made concept. By choosing a familiar, ordinary object and undermining its actual function, the artist turns it back into an unknown. The work proves that the formal nature of photography can obscure its content. In this case, avoiding the documentary role of the medium, the subject is not the object itself placed in the frame, but the beautiful and simple geometry of the image.

This new approach sought to liberate photography from rigid standards of perfection, including beauty in general[42]. Ambitious artists often departed from lyrical subjects, looking for objects that were not obvious, even ugly and boring. To give them new life, to show them in a different light[43].

August Sander, a specialist in the sociological portrait of various social groups, divided photographers into two categories: moralists and scientists. To the latter group undoubtedly belongs Karl Blossfeldt. Inspired by nature and the structural structure of plants, the German photographer published an album of "praformen" taken mainly from European flora in 1928. The publication, *Urformen der Kunst* (Praforms of Art), contains 120 charts. Developed in his own office with specialized photographic apparatus, he took - with incredible precision and detail - unprecedented photographs. Blossfeldt emphasized the key role of nature, claiming that "the plant should be valued as a completely artistic and architectural construction" Due to the rendering of details of leaves, stamens and hair follicles, the expert way of framing and lighting plant fragments, and the precision of execution, his works were considered useful scientific studies, and served a didactic function (*Modellieren nach lebenden Pflazen*, Modeling based on living plants). The monumentalization of the forms turned out to be crucial, as well as the appropriate retouching of the photos; thanks to such procedures, the essence of the issue was conveyed. The publication, later on, also provided him with recognition in the art world, during the era of the New Objectivity of the 1920s and 1930s. The use of plants in teaching was a key aspect for him. He encouraged drawing on nature's forms in projects, treating it as an infinite source of inspiration: "nature has become the

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[41] Susan Sontag, *O fotografii*, Kraków 2009

[42] "The camera creates a seamless method of finding another reality," Jerry N. Uelsmann.

[43] Irving Penn, perfectly understanding the above relationships, explores hitherto unconventional concepts in photography. Best known for his commercial commissions and fashion portraits, which were not considered art at the time, he develops his unique style that inspires to this day.

ultimate and inexhaustible source of aesthetic forms." In his view, the basis of art forms was to become "pure nature."

Not only in the world of art, but also in the realm of science, Nature is our best teacher.[44]

Despite the delicacy and palpable romanticism latent in the chemical medium, there is a kind of appropriation associated with the use of the camera. This was interestingly illustrated in Michael Powell's *Peeping Tom*, 1960. The main character, photographing young women, murders them with a weapon hidden in the camera as he presses the shutter button, while documenting the moment of the victim's death. This drastic vision metaphorically demonstrates the predatory feature of photography. The term "photograph" in our language used to be translated as capturing an image of the world. Nowadays perhaps less so, using smartphones frequently, we think of taking a picture as "taking down" the image of someone or something[45]. Tribal peoples to this day still feel the anxiety associated with having a piece of their person stolen by a traveling photographer. There are many terms associated with the process of photography reminiscent of hunting.

In fact, the camera turns everyone into a tourist wandering around the reality of other people, as well as in your own.[46]

Every photo is, after all, some slice of a larger reality. The photographer's eye selects a piece of that reality, frames it and thus decides, "telling" us what to look at. The only choice it leaves us is to possibly look away. When the main character in Alfred Hitchcock's movie *Rear Window* (1954) breaks his leg, confined to a wheelchair, to kill boredom he begins to observe the tenants of the neighboring house. Through his limited field of vision, he witnesses residual events happening "in the frame" of his window or outside it. Consequently, he comes to the conclusion of a murder committed there. Hitchcock's film perfectly illustrates the principle of the selective operation of the frame and the consequences of this.

Photography brings out the foreground, calls out of the row and points the finger. Just turning the lens on an object can give it prominence. Pointing it at a person can embarrass him or fill him with pride.

The camera creates a duplicate of the world, creating visions that are narrowed but more dramatic relative to those seen by the naked eye. The photographs are tinged with pathos, always referring us back to the past, evoking sentiment and a sense of another, past reality. As Barthes accurately notes, they are without a future[47].

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[44] Karl Blossfeldt, *Magic Garden of Nature* (1932)

[45] Photo - "a drawing straight from a person, made from an object, a map of the village prepared in this way", Słownik Języka Polskiego, edited by J. Karłowicz, A. Kryński, W. Niedźwiedzki, 1927.

[46] Susan Sontag, *O fotografii*, Kraków 2009

[47] "(...) it is a prophecy inverted: like Cassandra, but with eyes turned to the past, it never lies" (Roland Barthes, *Światło obrazu*).

All the photos say: "Memento mori". Taking a picture, we come into contact with mortality, fragility, transience of another person or thing. Precisely because we choose a moment, cut it out and freeze it, all photos are a testimony to the inexorable passing.[48]

Thanks to the achievements of the technological revolution, the machine and automatic (digital) imaging procedures enter the art world. From that moment on, the images thus brought to life cease to function as real artifacts. Vilém Flusser has consistently maintained that the advent of digital technology has not dramatically affected the understanding of photography, since all technical images have a point structure - in this case, built not of grain as before, but of pixels. Hence, there is no need to formulate separate assumptions of digital photography[49].

The digitization of photographic images and the development of technology open up new creative possibilities, also creating methods of image manipulation that were not previously possible. A digital image no longer needs to be strictly grounded in reality, nor does it need to refer to any specific physical material. It therefore loses its identity as a "witness" to reality in favor of unlimited creative possibilities. The digital image, which is a "mosaic" composed of pixels, allows, with the help of appropriate software (software), unlimited creative, manipulative and transformative activities[50]. The computer has become a metamedium for various photographic activities[51].

Progressive digitization brings with it a number of new dilemmas. We are used to interpreting reality through images. Since Platonic times, attention has been paid to this, warning against such an understanding of reality. By mass-producing images at an alarming rate, we are deepening this habit, which, as a result, threatens to lead to a general state in which, as a civilization, we will begin to value imagination over reality. A mirage beyond the original. Computer-generated photos by Austrian artist Dieter Huber eloquently comment on the importance of scientific progress. In his works, he often refers to topics related to the cloning of organisms and the creation of new species. He shows the above dilemmas in a subtle, radical and direct way, stretching the tension between naturalness and artificiality to extreme limits.

His series of works titled *Klones* (Klony) shows images of people, plants and landscapes - each time depicting something that we can assume went wrong in the process of creation. At first glance, the author registers seemingly normal-looking objects, but after a moment of contemplation, we feel the impression of unreality, strangeness and anxiety. Using irony as well as technical perfection and sophistication, he creates absolutely up-to-date metaphors. Perfect plants, consisting of flowers of various species, others resemble human organs or

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[48] Susan Sontag, *O fotografii*, Kraków 2009

[49] William J.T. Mitchell seeks to distinguish between the pixel and the photographic grain. The use of montage as a form of manipulating public opinion is also important to him. The German theoretician Andreas Muller-Pohle has a similar opinion, seeing the digitization of the image as the end of photography in its classical sense. For him, it is a technology that supports our thinking and understanding of the world. It is definitely worth considering such a duality of the medium - as an extension and complement to photography.

[50] The actions of artists such as Richard Horowitz open the door to digital space for photography.

[51] In 1994, the first exhibition of this type, "The Digital Photography Exhibit", was created in cyberspace.

limbs with six or more fingers. His works reflexively shape our fantasies, clearly reflecting man's desire to produce and manipulate nature. All objects were recorded in an analog form, later digitized in fragments, adapted to specific ideas and edited on a computer, and finally turned into a "physical" form of a two-dimensional pigment image[52].

(...) while traditional photography always refers to the past, synthetic photography shows the future.[53]

Digital (virtual) space - non-mechanical use of machinery

Computer-generated images (graphics) can be visually similar to those obtained by traditional, purely manual, photographic or film methods. The difference is apparent only at the level of the material and structure of the image. They are built of pixels, described by a specific algorithm or mathematical equation. The operations that can be performed on such images are also different. The simulated reality is not related to the real world, as is the case with analog techniques. From the very beginning, digital operations have sought to surpass the visual fidelity of analog technologies. Realism seems to be the overriding goal and the driving force behind the beginning of research in the field of computer graphics. The idea is to simulate traditional cinematography and the physical characteristics of real objects and environments.

Such assumptions led to photo-realism at a rapid pace. Eventually, photographic reality, as seen through the eye of the lens, is imitated. The virtual space (scene) has a virtual camera, similar to a movie camera, it is not a simulation of assisted "naked" human vision. With its help, we "frame" the virtual reality (which must be built from scratch beforehand), selecting from it the part of interest. The optics of a 3D image also refers to the lens and its artifacts, we use such parameters as depth of field, focal length, film grain or focus. When building a virtual composition, we influence the type of lighting, its intensity, direction and color, just like on a set (set). All these procedures are intended to make the synthetic image more accessible, more familiar. Despite these efforts, a photo-realistic simulation of the world seems unattainable for the time being, since we are dealing only with selected phenomena of reality. Unlike the real space we find ourselves in, 3D computer space does not privilege any

[52] Eduardo Kac, the precursor of bioart, is much bolder in his artistic activities. Causing a lot of controversy with his works, he raises questions about the ethical issues of this type of practice related to genetics. He created, among others hybrid by combining your own genes with those of petunias in the lab. A new plant species "Edunia" was bred. The petals of the flower are covered with red veins that evoke associations with the human circulatory system. The work is the result of fascination with the possibilities of creating new, non-existent entities and species. Through such procedures, the author also tries to draw attention to the possibility of a community of all living organisms. All species have common ancestors.

[53] Lev Manovich, *Język nowych mediów*, tłum. Piotr Cypryański, Warszawa 2006

axis. I find analogies here to Malevich's suprematist compositions - an abstract cosmos unfettered by any dimension or gravity.

Digital images are characterized by the disappearance from the realm of material artifacts, the very process of dematerialization of the image continues to deepen. A typical image of three-dimensional computer graphics often seems to us unnaturally clean, too smooth, too sharp or unnaturally geometrized, has too much detail. It gives the impression of being too perfect - it is hyperreal. It may contain much more information than our senses need. There are known cases of "deterioration" of generated images in order to make them more realistic[54]. Nevertheless, the objects of new media do not hide their artificiality, incompleteness, how they are constructed. They create a certain illusion in front of us, only to immediately discover the mechanism that governs it. Artificial reality, fragmented and uneven, which we can obtain through three-dimensional computer graphics, is essentially incomplete, a lot of gaps and empty spaces. - What from the point of view of artistic activities is often a fascinating field for action and creation.

Digital media is characterized by the possibility of different "performances" of the same image. Each object of new media is characterized by modularity: a digital image should be considered as a multiplicity of potential realizations of it. It is generative - it ceases to refer to reality, taking on a form described by Jean Baudrillard as a simulacrum.

Another issue I find intriguing is the temporal dynamics that characterize digitally generated images, particularly the imaging technique called "level of detail." As the user moves through the virtual reality, models are rendered in an approximate manner, while when the user stops, the detail gradually increases and builds up. Looking once again at traditional photography (depth of field) and the nature of human perception and physical factors (density-air), I find some interesting parallels in this.

Art and technology historian Frank Popper uses the term "virtual art" (*From Technological to Virtual Art*, 2007)[55] to refer to the activities of all art produced with technical media. It is characterized as a form of activity based on the combination of art and technology, and thus includes virtually all previous media as certain subsets. Popper conceives of contemporary virtual art as a further refinement of the technological art of the late 20th century. Through the interface, he sees the integration of man and technology. The discovery of new media, he believed, is the humanization of technology, the emphasis on interactivity and its multisensory nature.

Nowadays, computer-simulated virtual worlds[56] (e.g. Second Life, Roblox, The Sandbox) can be populated by more users, through their interactive avatars. As technology has advanced, such platforms have quickly evolved into vast and elaborate maps full of complex 3D models. Artificially generated environments and scenery, through editors, allow their users to interfere

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[54] E.g. *Avatar*, James Cameron (2009), *Jurassic Park*, Steven Spielberg (1993), despite the resilient development of technology, the scene with the brachiosaurus still inspires appreciation among viewers today.

[55] The creator of the term "virtual reality" is considered to be Jaron Lanier. Its Polish equivalent is: phantomatics - a technique for creating the illusion of artificial reality in the human mind, a term coined by Stanislaw Lem (according to the Polish Language Dictionary PWN).

[56] The "Metaverse" - a term first used by Neal Stephenson in his 1992 dystopian science-fiction novel *Snow Crash* (Zamieć). Today, the term is defined as a three-dimensional virtual reality world, which is expected to be the next, more complex and advanced evolution of the Internet.

with each other. They relate to the real world, to some extent imitate it, but are not limited by, for example, the laws of physics[57].

Today, the participation of the virtual world in culture is so strong that analog and digital art can no longer be so easily distinguished and separated[58]. The new medium in the early 1990s was treated as an area of increased exploration and fresh tissue for many artistic experiments. The Internet moved from the hands of specialists to general use.

"A descendant of Méliès" calls M. Giżycki Zbigniew Rybczynski[59], paying special attention to the versatility of the author. He appreciates him as a thorough craftsman - a visual artist, an original inventory, a researcher and an aesthete. He points out how the various stages of his creative path brought him to change his basic creative techniques, from canvas to light-sensitive tape to the virtual/digital image.

Today, these two worlds, digital and analog, have come closer together than ever before. Of course, a distinction must be made between the analog attitude and the digital attitude. The former still treats the virtual world as somewhere outside reality, a place where we must "enter" and "log in." However, it is necessary to be aware of the already inseparable entanglements between the virtual world and reality. New media have become an invisible but permanent tissue intertwining with real physical space, entwining it in a web of dependencies. They have become an inseparable element in our everyday life. Progressive digitization is also dissolving the once firm boundary between original and duplicate, making unique creations copyable[60]. The very process of the formation of color impressions in humans when they come into contact with a work of new media is also changing. With the change in optics, the theoretical and practical aspects of the external factors involved in this process are also changing. Digital media of modern visual culture permanently change our idea of what an image is, because, they turn the viewer into an active user.

One of the pioneers of virtual and computer art, Miguel Chevalier creates multidisciplinary works addressing issues of immateriality, unreality, hybridization of nature, generativity and interactivity. He builds his statements by emphasizing the relationship between nature and the synthetic world.

The Extra-Natural project is a monumental virtual garden (17 × 4.3 meters) in which luminous plants come to life. The work presents nature in its reinvented version. It involves the creation of new varieties of plants, using algorithms that describe biological life, and their subsequent transposition into the digital world. As a result, the viewer is immersed in the unreal face of an alien and overly expansive nature. The work is interactive. The virtual plants react to the viewer's movement. Plants bend their delicate stems, flowers bloom, leaves wither or unfurl, plants interbreed and are reborn in new varieties. The installation is periodically regenerated, each visitor finds the garden in a different, unique state of development.

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[57] Such simulations are not just for entertainment. Virtual worlds are useful, for example, for pilots, drivers, surgeons or during military training. The user in extreme and unusual conditions completely safe for health and life can repeatedly carry out a specific simulation.

[58] Network artist Guthrie Lonergan says the phenomenon of "Internet aware" refers to aspects that depend on the Internet however affect reality; transferring Internet trends to the real world.

[59] In book *Nie tylko Disney*. *Rzecz o filmie animowanym*, Warszawa 2000.

[60] Blockchain technologies, having unique data encryption, try to prevent this.

Chevalier directly addresses the topic of genetic manipulation. Is it reasonable to interfere with nature and fully control it? We cannot predict what these synthetic plants will produce. Left to their own devices, they will interbreed and reproduce indefinitely in an unlimited and free way. *The Extra-Natural* project talks about the preservation of biodiversity and the symbiosis between man and nature. Another important question posed by the author is whether artificial life can become completely autonomous.

III

Description of the art project and the exhibition proposal, *On the way of light*

In the concept of the exhibition entitled *On the Way of Light*, I present works from five projects that together form a coherent whole. Centrally placed are photographs from the series *Record of Light / Impulse* - as a reference to reality and a record of direct inspirations resulting from observations of nature. Appearing between them are graphics, made in the form of monotypes, leading to further synthesis and analysis. Placed in the center of the exhibition room, they inform about the impact of these inspirations on all the presented works. They become a starting point for reading the other activities.

Hanging on one wall are photograms from the *Nature_Matter* series, made using a camera-free method.

On the floor are sculptures from the *Morph XYZ* series. With their monumental size, they cast shadows, slightly obscuring the other works. They grow out of the floor plane, having been freed from their bases.

In opposition to the manual activities, I present the works *Nature Artifacts*. These are 3D prints made from biodegradable filament. Despite their "artificial" character, through the right choice of form and material, I try to give them a natural element.

I treat the *Still Life* project as a summation, a kind of bracket combining archaic and contemporary techniques of invoking and capturing/recording images. Since one of the first photographs was taken, there have been many changes related to our perception and the way we record and perceive reality. New tools open up new challenges for us, but also create the need to redefine established paths of thought.

The individual works are relative to each other in relations of concise dependence, building the unity of a broader statement. I also observe this type of relationship and dependence in nature - superorganism. Thanks to such assumptions, works marked by biologism were created. The possibilities of new media are intertwined with the nostalgia of these more artisanal activities.

Record of Light / Impulse

5 photograms made in cyanotype technique,

200 × 140 cm (each work), cotton canvas stretched on looms.

"imago lucis opera ex-pressa" image expressed, or more precisely, "imprinted", by the action of light on sensitive material.

Cyanotype is, tracing the history of photography, one of the oldest chemical methods used to create an image. It uses the photosensitivity of iron salts to produce a negative image. The first cyanotypes treated as technical images were more utilitarian than artistic. This method was often used to copy graphic and stationery materials (blueprint)[61].

I used sunlight for the exposure process. The light-sensitive emulsion with which the cotton canvas was coated and the appropriate exposure time made it possible to achieve the effect of transparency and overlapping layers. Doing further tests, I selected appropriate exposure times. The changing intensity of light during the day determined the appropriate time.

The series consists of:

1. photograms, i.e., images obtained without the use of a camera and a negative, by placing objects on a pre-sensitized canvas.

2. contact photographs made by contact. I use a stencil, through which I cut off the access of light to the emulsion, control the time during which the canvas is subjected to solar exposure.

3. works created by directly contacting the sensitized canvas with a specially prepared negative made on transparent film and exposing it to sunlight.

To prepare the emulsion, I use ferrous ammonium citrate (green) and potassium ferricyanide. Mixed with distilled water in appropriate proportions, they form two separate solutions, which only when mixed together give a light-sensitive emulsion ready to cover the surface of canvas, paper. As a developer, ordinary water is used, which washes away the residual chemicals, thereby stopping the exposure process. To enhance the blue and give it more depth, I sometimes use hydrogen peroxide 20%.

Cameraless photography, with its experimental form, perfectly explores the interaction between the subject, its shape, afterimage and light. Recording of the light waves reflected by the objects occurs in a direct way. As a result, I am dealing with a kind of material residue of an object. Such an image, Barthes literally calls "squeezed" from nature (like lemon juice) by the action of light (Latin: "Imago lucis opera ex-pressa").

The use of photosensitive materials to record such direct interactions has found its practical application in scientific research. X-rays and radio waves are used to study structures and particles invisible to the naked eye. Today, laser scanning is used.

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[61] Anna Atkins used this method to produce illustrations for her book on algae: British Algae: Cyanotype Impressions, (the first book ever illustrated with photographs)

Nature_Matter

12 photographs, format: 30 × 45 cm (each), framed: 60 × 44 cm,

Technique: photography, photographic paper, pigment digital printing,

3 workshop prints, format: 60 × 44 cm (each),

printmaking, relief printing, monotype,

total composition: 3,5 × 2,2 m

I supplement my work with the use of digital photography. I reach for it reflexively, as a medium that is present everywhere today, convenient to use. I abandon the chemistry lab in favor of the speed of registration and the convenience with which a digital image is created, stored on a computer hard drive. I analyze animate matter, complicated in its structure, with my camera. Photography provides me with information. In turn, the search for something beautiful, plugged into a mundane subject that has been taken many times, prompts me to take photographs. I seek, discover and show the creativeness of nature, its causality and the non-human.

The concept of matter plays an important role in many fields of knowledge, especially philosophy and physics or biology. Matter is considered one of the basic substances of the world. It is understood as the carrier of all properties of things. The camera(ura), early in its invention, was commonly used to learn about the world. The camera isolates fragments from the whole, atomizes reality, the less it seems to hide more information than it shows. Looking through the viewfinder, I see forms, shapes and juxtapositions that escape the distracted eye. When taking pictures, I often used specialized filters attached to the front of the lens. Thanks to such procedures, only selected sunlight enters the lens, and the camera's sensor captures what the naked eye cannot see.

I use the following filters:

- UV&IR Cut - which blocks ultraviolet (UV) radiation while maintaining high transmission of visible light.

- PL-CIR - a filter that allows to control the reflection of light from highly glossy surfaces, like water.

- R72 - a filter that transmits only infrared light, blocking visible light to a wavelength of 720 nm. In addition to reducing haze, it enhances contrasts.

- Close-up lenses - These are glasses with focusing ability, allowing me to get as close to the subject as possible. They give a larger scale of reproduction, as in macro photography.

Using the UV Index app installed on my phone, I check when the radiation is strongest, which is when I take all the photos. These have always been summer days with clear skies, between 11am and 1pm.

In the works I deliberately abandon color. Black and white photographs show reality in a more synthetic form. The frames, framed in white, are meant to emphasize the selective and decisive action of the camera. The domain of photography from its inception has been grain, monochrome stain, contour and contrast. Shyly penetrating color (at first it was hand-tinting) for a very long time seemed unnatural. Black and white photography allowed to better know and understand many cultural, scientific and biological phenomena[62].

The project consists of three rows of works relating to nature. I divide the monochromatic compositions into three groups: "object", "template" and "copy". Between the photographs there are graphic prints made in monotype or relief printing. Sketchy and limited in form, they refer to the successive paths of my search, interpretation, resulting from extended observation of nature. The element of coincidence and the lightness of monotypes are combined with a thoughtful strong construction of black and white photographic images.

[62] Black-and-white photography still has its many supporters. Leica in 2020 introduced the Q2 Monochrom camera, whose full-frame (36 by 24 mm) sensor of 43 million pixels has no color filters (the camera requires no interpolation, capturing only pure light intensity).

Morph XYZ

3 spatial objects, styrodur, glue, wire, acrylic paint, spray paint

Format:

Sculpture I: 3 × 0.5 × 1.6 m

Sculpture II: 1.5 × 1.4 × 0.6 m

Sculpture III: 0.6 × 1.8 × 0.6 m

Johann Wolfgang Goethe emphasized that organic forms contain constant movement; nothing static can be found in them. Life is expressed in wavy lines and shapes, which stand in opposition to straight lines and angular structures with visible structure. Such is the Morph XYZ project, showing the constant transformation of shapes, fluid matter and natural associations. "Everything streamlined attracts touch" (wrote French philosopher of science, Gaston Bachelard). However, if we are dealing with a drawing or reproduction, we are left with a visual experience, touching by sight, seeing as a kind of touch (Maurice Merleau-Ponty).

The availability of a wide range of tools and a multitude of possibilities, access to software to support the work, sometimes has a perverse effect. I feel the need for physical contact with sculptural matter, with the forms I invoke. I am interested in the process of extracting form from a lump of material, cutting, grinding, cutting, physically experiencing matter. I work with my hands and simple tools (hammer, saw, sandpaper) in opposition to the precise machine and the rational calculation of the computer.

Shapes are gradually extracted, found in the lump of plastic. The outline of the forms is soft, the outline flows around the form, gentle transitions do not create clear demarcations - I try to keep the distribution of light on the recesses similar. I think the work also reflects my tendency to seek formal simplification, that which is simple and direct and expressive.

Thanks to the general idea associated with the construction, the sculptures are able to maintain balance. This allowed me to free them from pedestals. The forms give the impression of sinking into the ground or growing out of it. They are growing. It's as if the rest of them are still in the ground. This is also a reference to the three axes that describe space, the XYZ dimensions. The viewer is confronted with the impossibility of seeing the forms in their entirety - which is supposed to build and set a certain barrier, a limit to cognition.

What matters to me is their shape, size and sheer mass, which contains some emotional charge. I cover the objects with matte paint, so they fit better into the landscape. "Shiny surfaces disturb the clarity of lines," Arp claimed.

The sculptures yield to different modes of organization. There is no privileged view or arrangement here. I maintain a multiplicity and equivalence of perspectives. Observation from each side is meant to reveal new facets. Composed of monochromatic oblate shapes, they are arranged in an unforced configuration relative to the forms present in nature. A metamorphosis of the flow of natural forces and change.

My intention is that the sculptures enter into a dialogue with the natural environment in which they are placed. I am committed to fitting the work into nature. In these sculptures I look for a contrast to the utilitarian shapes I see every day.

Nature artifact

3D printing, biodegradable filament (fiber)

23 objects enclosed in 4 display cases

Format of one object approx: 20 × 12 × 6 cm

The philosophical concept developed by Mikhail Matiuszyn concerns the universal principles governing nature ("Not art, but life"). In the era of the development of sciences, he is interested in creating a new method of observing nature "Zorved" (from Russian "to see" and "to know"); he is looking for new spatial dimensions and expanded vision ("rasszyrienije zrienije ") The world seen "with the back of the head - with the back" - so as to include all phenomena and hidden relationships; "one must learn to include a 360-degree angle." As a result of his explorations, he will consider twisted tree roots (1912, root sculpture) as perfect manifestations of the growth of matter, as a natural starting point. According to his concept, the growth of matter, taking place in all directions simultaneously, has the power to create living beings.

The project is inspired by the arrangement and structure of chromosomes found in the human body. It is also a fascination with the organic structure of man, his biological nature and his belonging to animate matter. I began my work by collecting data on the genome, DNA strands and chromosome sequences of various organisms. This is an attempt to change the perspective, focused mainly on humans. To show the limits of human interference in the processes of shaping nature. It is also an attempt to engage or provoke the viewer to a deeper analysis of himself in the context of the changing environment in which he currently functions.

I modeled the forms in digital techniques, using algorithms and 3D software. They were materialized as 3D prints. The objects are generative in nature from the beginning. The goal was to create objects devoid of artificiality ("plasticity"), inspired by vitality similar to a plant bud or embryo. Intentionally left imperfections, they inform us that we are dealing with a man-made artifact and not a creation of nature. Enclosing them in display cases is meant to heighten the impression of their fragility and imperfection. The threads created during printing give an association with a cocoon.

A destructive effect on the ecosystem is the emission of not only exhaust fumes, but also excessive plastic. PLA material, from which the objects are made, is biodegradable, made from natural raw materials such as plant starch and bran. Bacteria responsible for the decomposition process feed on this type of material and can cause it to break down. Of

course, such a process can occur under specific conditions, such as high temperature (above 60 degrees C), high humidity or contact with soil. The first signs of decay can be observed after a few months. Objects stored under optimal conditions do not degrade. UV sunlight alone does not cause decay, only affects the tarnishing of color.

The vision in which the resulting artifacts eventually return to nature is a purposeful complement to the project. 3D printing is intended to serve a utilitarian purpose, to be durable and not subject to damage. The technology is used, for example, to make prosthetics or machine parts. The objects have their roots in a generative virtual environment, somewhere in the silicon of a computer processor, and have been designed in a 3D graphics program. Their materialization and subsequent decay is written into their "genes."

The objects are transferred to physical space. They no longer manifest themselves as virtual manifestations, but show their real presence. Materialized, from now on they lose their invulnerability, their shape undergoes a process of decay, they become fragile and delicate.

Still Life

3D scan of a room, still life

Presentation on iPad11 tablet + projector (projected image 1.8 × 2.5 m)

We can consider the modern hologram[63] as an advanced variation of the heliogram - the first photograph taken by Nicéphore Niépce without a camera, before the invention of photography, using rays of light.

A table, a chair, a few books and small everyday objects that lie on the table, located in my room. This is the place where I stay every day, sitting at it, eating breakfast, reading or drinking coffee. At this table, while working on my doctorate, absorbed in my thoughts, looking for a motive, the right place to make virtual scans, I found it right in front of me. A place so special to me, and yet so ordinary, labeled to the point of being overlooked by my visual apparatus. On a daily basis, I don't pay much attention to what or where it lies. The graceful subject of still life has returned to me, but in a different guise. But is it that new? A scan of the place made, stopped time in place, captured that moment. So I'm watching what was, turning and scaling my (already) virtual table from the past. Just as in Niépce's work the particles took in portions of rays of light and burned out, here the immobilization of time is accomplished by laser beams. The scan has the characteristic of being out of date. Like the first analog photography, showing the interior of the studio. Caught rays of light, reflected

[63] Spatial image obtained as a reconstruction of waves, mainly light (direction, amplitude, frequency). With this method, we can get much more information about the photographed object or scene.

from the matter of real objects and permanently recorded on a steel plate covered with emulsion. The result is a grainy image, a record of a real place[64].

In the case of LIDAR technology, the laser rays run from the camera lens, reflecting off material objects and falling back into the lens of the device. The touchscreen tablet and software allow us to penetrate deep into the structure of the image and view it like a star constellation. We are communing with the "spirit" of the place recorded in digital form.

In addition to the undeniable visual similarity at first glance, I see a common denominator in the construction and structure of these images. A spatial image consists of many millions of points "suspended" in virtual space. Registered, grasped and recorded. A laser beam bounced off each visible point and fell into the camera lens, later transmitting the acquired information to the processor. From the collected information, a dense cloud of data (points cloud) was created, suspended in a three-dimensional virtual space. Such a record of physical matter, literally zapped with a laser beam, allows me to recreate my table from the past in three dimensions. I see in this an analogy of the process that, less than 200 years ago, began with the 1826 photograph View from a Window in Le Gras and the Set Table, by Nicéphore Niépce (Still life of a set table, 1832).

(...) a new media object consists of independent parts, each of which consists of smaller, also independent parts, and so on down to the level of indivisible "atoms" – pixels, 3D points, text signs.[65]

With these considerations, a memorable scene from the film R. Scott's The android hunter (1982), in which the main character investigates a crime scene by analyzing a photograph of the place. With the ability to scale and rotate the image, he discovers new clues previously hidden. Futuristic vision of science-fiction[66], became reality (the action of the work takes place in 2021).

This is one of the first permanent photographs. It was taken in 1832 by Frenchman Joseph Nicéphore Niépce. The image was fixed on a polished zinc plate coated with Syrian asphalt. Production required hours or, as some researchers believe, several days of exposure. The correct date for the invention of photography is considered to be only 1839.

[64] "Literally, the photograph is an emanation of the reference object. From the real body that was here came rays that touch me - me who is here. The duration of the message is irrelevant; a picture of a person who is no longer there comes to me like stray rays of a star. As if something like an umbilical cord connects the body of the photographed thing with my gaze. The light, although untouchable, is here a bodily environment, an epidermis that I share with the photographed: with him or her" (Roland Barthes).
[65] Lev Manovich, *Język nowych mediów*, tłum. Piotr Cypryański, Warszawa 2006
[66] Philip K. Dick, Do androids dream of electric sheep? (1968), the novel on which the film was based.

Documentation of the art project

(Exhibition presentation proposal)

Summary

Modernity brings with it changes in definitions - of life, nature and the role and position of man in the context of the environment. The constant development of sciences and technology prompts us to check the validity of these concepts and to constantly examine the relationships between them. Artists actively participate in such debates; through their works, they often very boldly push and form new boundaries. Contemporary art undoubtedly seeks to show the multitude of relations between what we call the organic body and less organized, inorganic matter. We are witnessing the transformation of culture into a new kind of nature. The old dichotomy is disappearing, so that the boundary seems to be blurring, and technology is beginning to penetrate more and more deeply into other aspects of our lives, thus undermining human autonomy more and more boldly.

On the Path of Light is an art and research project that seeks to show the synergy and flow of media. It was created in the contemporary context of the theme of biomorphism. In the activities I use the potential of the natural world and its usefulness as a model and source of artistic creation. I present an atomized world of dependencies of individual works.

In my work I refer to the complex relationship between man and nature and the relationship of modernity to civilization/culture and nature: the image of illusions, dreams, fears and in-depth considerations, which, due to their universal nature, are relevant today. I pose questions about the role and meaning of civilization in the age of expansion of media, medical and computer technologies. Nature becomes a key point of reference for me. In a basic sense, it is understood as a "wild" force that man should master, subdue and tame. Culture is all that man brings to it (language, writing, literature, art music, technology, religion, science). The sense of dependence on the environment and the focus on life processes is manifested in each of the attempts at interpretation. At the same time, we feel subconsciously, regardless of the accepted view, that the whole in this case is more than the sum of its component parts. What we understand by "nature" is fluid.

The prevailing mood at the end of the 19th century deepened the sense of reaching the limit of the human evolutionary cycle and, consequently, the fear of extinction of the species.[67] "(...) all the suns and stars are going out, and humanity with all its institutions and creations is perishing in the midst of a dying world" - Max Nordau wrote in 1892. The complete change of culture and the salvation of mankind were thus to consist in the reorganization of life by moving closer to the originally natural state. "As the mythologies of all nations teach us - man not only lives on the surface of the earth, but also grows out of it, is its son. We are a creation of dust, earth and air."[68]

In my work I have traced only a fragment of history, but it seems to me that in this particular place, in the face of increased development of science and technology, fundamental questions are taking shape: about the place and role of modern man in shaping nature. Are we sure that nature is an inexhaustible resource? As an integral part of it, are we able to live in symbiosis with other organisms? And also concerning potential climate disasters. In the current time, the dynamic development of technology, new devices are appearing to support the work on many levels, the reason for their appointment is the interference and transformation of matter. Until now, the reception of art has only been through our senses and reason. Today, agreeing with Marshall McLuhan, the medium itself has become the message[69].

Technology, treated and understood as an idea (Raoul Heinrich France), in which any man-made form (the creation of a new quality) with the help of new scientific advances is deeply rooted in a shape derived from nature, is based on principles derived from nature.

We can get the impression that in the modern world the intertwining of technology and nature is inseparable, and the integrity of these areas occurs bi-directionally. This fact definitely affects the violation of human subjectivity, introducing an element of consternation in the orderly vision of the future. From time to time, it raises a slight anxiety in artists as to whether sometimes traditional art is not "losing" to technology[70]. - Perceived today perhaps even more strongly, with the emergence of artificial reason (artificial intelligence), out of human control. Our future is not a foregone conclusion; as many researchers (Pierre Francastel, Sara Danius) argue, it depends on the attitudes developed by art itself[71].

The theory of the Anthropocene[72], a new epoch in the history of the earth, the age of man, refers mainly to reflections on the environment. It is the main narrative of recent years in the context of art. It emphasizes the rapid impact of man on the functioning of natural processes (urbanization, depletion of fossil fuels, pollution and gas emissions). Man is interfering and changing nature far more rapidly than the original geological processes did. This interference is beginning to be so spontaneous that, according to Wojciech Fangor: "(...) nature takes over the remnants of old culture in an uncontrolled way, art becomes chaotic and transforms into a new organic phenomenon along with the rest of culture." Organizing the environment was

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[67] Charles Darwin and his theories of evolution - "survival of the fittest," extinction of species as natural selection - effectively fueled these fears.
[68] Elisee Reclus *La Terre et I'Humanite* (1868)
[69] *Zrozumieć media: przedłużenia człowieka*, Warszawa 2004.
[70] According to a well-known anecdote, Duchamp, seeing a propeller in the Air Salon, heralded the end of painting.
[71] In his analysis, Bergson considers the human intellect as "alien" to its biological owner.
[72] rom ancient Greek, from anthropos (human) and kainos (new). J. Zalasiewicz, M. Williams, W. Steffen, P. Crutzen, *"The New World of the Anthropocene"* Environmental Science and Technology, 2010, no. 44.

once seen only in a positive aspect, as the taming and subjugation of the blind forces of nature; today we know how far from the truth this is. Following the theory of the Anthropocene, our biosphere and environment have been permanently transformed by technology, so it is now pointless to separate natural and civilization factors. We can speak of a new phase in human history. As a counter to these assumptions, posthumanist theories are emerging, looking at the transformation of living organisms into cyborgs or biological-mechanical hybrids, more perfect than their predecessors[73]. Contemporary considerations also echo references to older philosophical currents (Hegel), or to Walter Benjamin's "second nature" - understood as the world of machines - which has become so common that it should be treated equally to the first. Man, together with his creations, should be treated as a coherent whole.

Compared to this second nature, man, who has invented it but has long lost control of it, is as dependent on science as he was before the former. Art is enlisted again in his service...[74]

Further concepts of "zero nature" are currently being developed - or "fourth nature" - in which civilization becomes part of something much larger, already understood in cosmic terms. Nature, degraded by man, colonizes areas anew, restoring them to their original state[75].

Perhaps man's constant struggle with matter, his attempts to tame nature, are a reflection of dreams of returning to Eden - a place of ideal symbiosis, a garden of unity between man and nature. Torn from there, naked, we encounter thorns and weeds on our way. We laboriously build roads to take us back there. Despite the dynamic changes in the environment and the development of the sciences, no matter what view we take on the matter, one thing is certain: drifting somewhere in space, doused by the sun's rays, we feel the need to render in art a creative force equal to that inherent in nature. With this, we build qualities that are equally durable, solid and timeless. Our achievements grow on the earlier achievements of civilization, keeping our species in constant motion, developing upward, toward the sun, toward the stars.

If we do not honor our past, we lose our future. If we destroy our roots, we cannot grow.[76]

[73] S. Herbrechter, *Posthumanism: A Critical Analysis* (2009).
[74] Walter Benjamin, *Dzieło sztuki w epoce jego reprodukowalności technicznej*, [w:] idem, *Twórca jako wytwórca,*
[75] The concept of fourth nature was introduced by German researcher Ingo Kowarik.
[76] Friedensreich Hundertwasser

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