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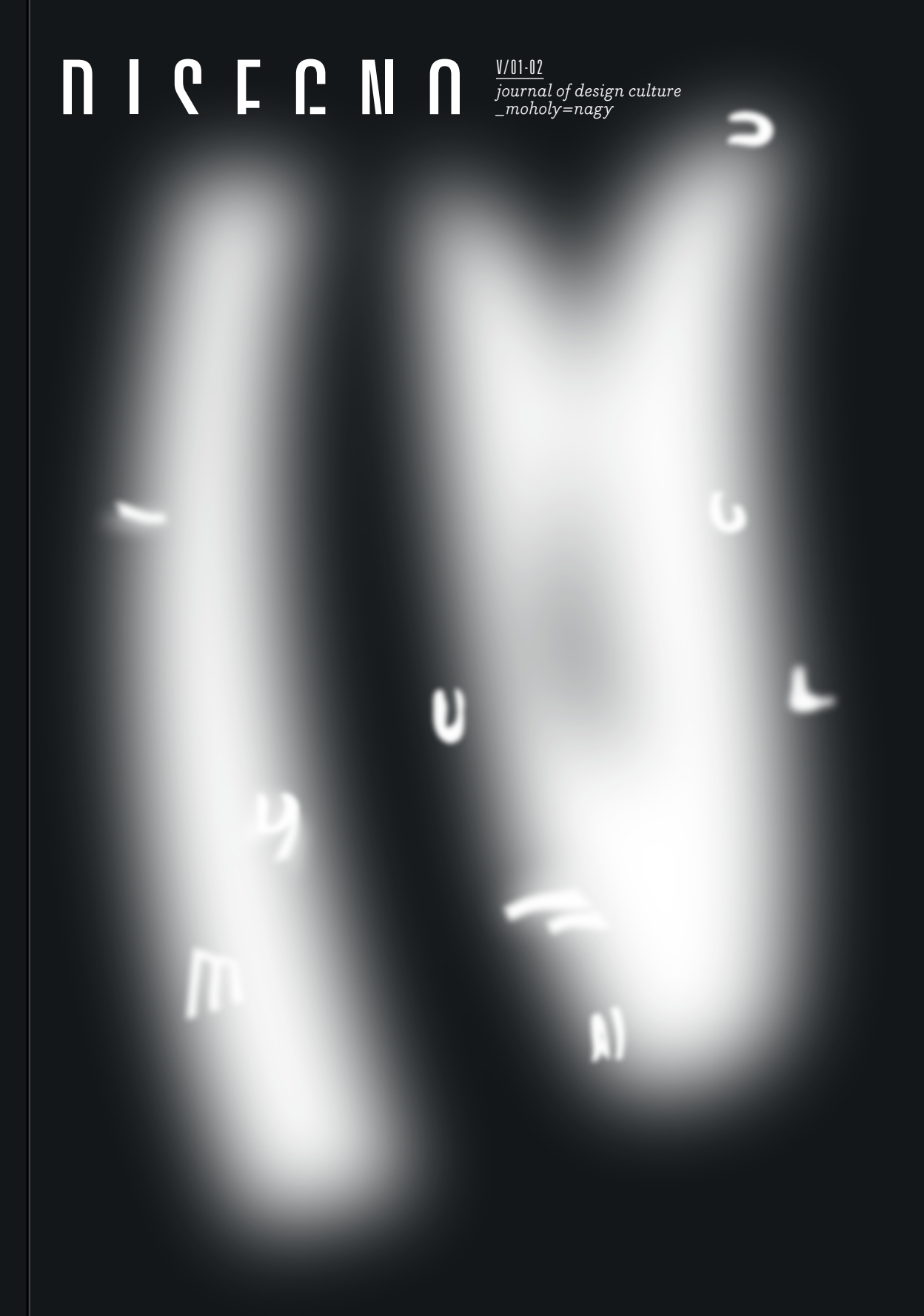

Disegno

Journal of Design Culture

Double-blind peer-reviewed, open access scholarly journal. Not for commercial use.

Aims and Scope

Disegno publishes original research papers, essays, and reviews on all aspects of design cultures. We understand the notion of design culture as resolutely broad: our aim is to freely discuss the designed environment as mutually intertwined strands of sociocultural products, practices, and discourses. This attitude traverses the disciplinary boundaries between art, design and, visual culture and is therefore open to all themes related to sociocultural creativity and innovation. Our post-disciplinary endeavor welcomes intellectual contributions from all members of different design cultures. Besides providing a lively platform for debating issues of design culture, our specific aim is to consolidate and enhance the emerging field of design culture studies in the Central European academy by providing criticism of fundamental biases and misleading cultural imprinting with respect to the field of design.

All research articles published in Disegno undergo a rigorous double-blind peer review process.
This journal does not charge APCs or submission charges.

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Contents

DISEGNO_V/01-02_MOHOLY=NAGY

DESIGN FOR LIFE:
MOHOLY-NAGY'S HOLISTIC BLUEPRINT FOR SOCIAL DESIGN PEDAGOGY AND PRACTICE

Lee Davis and Bori Fehér

ABSTRACT

Design discourse is evolving in response to a confluence of global challenges: a pandemic; increasing economic disparities; systemic racism and social inequality; rising authoritarianism, nationalism and political division; and the urgency of the climate crisis. Designers are increasingly questioning their role and responsibility in the world and seeking opportunities to leverage their creative talents to address these intractable problems. At the center of this critique is also a fundamental reappraisal of the predominant design paradigm, the anthropocentric process of "human-centered design," promulgated since the mid-1950s (Dreyfuss 1955). A growing body of literature has emerged, questioning the human-centric perspective in design (Benyus 1997; Norman 2005; IDEO 2014; Fulton 2019; Escobar 2018; Boradkar 2015; Weaver 2019; Hess 2020). Concomitantly, the concept of "life-centered design" is gaining attention among design educators, students and practitioners. But to refer to the concept of life-centered design as "new" would be disingenuous. László Moholy-Nagy advocated for such a revolution a hundred years ago. From the early 1920s he called for a holistic, organic, life-centered design pedagogy, practice, and mindset. Much has been written about Moholy-Nagy's art, photography and teaching but relatively little attention has been given to his pioneering thinking, writing, and practice in "social design." Moholy-Nagy was also a pioneer in articulating a role for designers in addressing the critical economic, social, and environmental challenges of the time. As the founding director of the New Bauhaus and the Institute of Design in Chicago, he believed designers would need to move beyond the consumerist view in favor of "a better understanding of those principles which control all life"—individual life, social life, and life in the natural world. Driven by his own humble beginnings and rural upbringing, his personal trauma in war, the rise of Fascism and the onset of a second world war, his itinerant life across diverse cultural, artistic, natural, and theoretical influences, Moholy-Nagy evolved a blueprint for a vision of life-centered design that is as salient today as it was a century ago.

#holism, #design pedagogy, #life-centered design, #New Bauhaus, #social design

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A designer trained to think with both penetration and scope will find solutions, not alone for problems arising in daily routine, or for development of better ways of production, but also for all problems of living and working together. There is design in family life, in labor relations, in city planning, in living together as civilized human beings. Ultimately all problems of design fuse into one great problem of "design for living."
(Moholy-Nagy, "School of Design," 2)

LIFE INFLUENCES

László Moholy-Nagy's conception of life-centered design evolved over time through his own process of self-actualization and exposure to a diverse variety of personal and professional life experiences, philosophies, and movements, much as he hoped would be the result of his teaching for his own students. It seems that his childhood upbringing in rural, southern Hungary had a lasting effect on how he saw and experienced the world around him and ultimately how he conceptualized a holistic, life-centered approach to his art, design, and teaching. He was born in the two-street village of Borsód, now Bácsborsód. In *Experiment in Totality*, Sibyl Moholy-Nagy indicates that from this early village life Moholy-Nagy developed a deep appreciation for authenticity and simplicity in people and in life. He "retained a deep suspicion of verbal smartness, and he delighted in straight earthly fun. 'Shaggy-Dog Stories'—of talking animals and dumb humans—were his favorites." (S. Moholy-Nagy 1950, 191)

According to his daughter Hattula, Moholy-Nagy's experience in World War I was also formative and crystallized his social idealism and sense of purpose in life. (H. Moholy-Nagy n.d.) In May 1919, upon returning to Budapest from the front, Moholy-Nagy wrote in his notebook about his social responsibility and the meaning of "biological happiness":

During the war, but more strongly even now, I feel my responsibility toward society. My conscience asks incessantly: is it right to become a painter in times of social revolution? May I claim for myself the privilege of art when all men are needed to solve the problems of sheer survival? […] I have finally learned to grasp what is biological happiness in its complete meaning. And I know now that

if I unfold my best talents in the way suited best to them—if I try to grasp the meaning of this, my life, sincerely and thoroughly—then I'm doing right in becoming a painter. It is my gift to project my vitality, my building power, through light, color, form. I can give life *as a painter.* (S. Moholy-Nagy 1950, 12)

Moholy-Nagy was also heavily influenced by the social idealism and anti-capitalist ideals of the European Avant-Garde and Constructivists (Margolin 1997). According to Hattula, Moholy-Nagy was "strongly attracted to Constructivism for its social philosophy, which saw art and the artist as active agents in improving society." (H. Moholy-Nagy n. d.). After the First World War and Hungary's own revolutionary and political turmoil, Moholy-Nagy moved to Vienna where he joined the revolutionary *Ma* (Today) group of Hungarian avant-gardes. He wrote in *Ma* magazine in May 1922 of Constructivism's purity, that it was primordial, that it "expressed the pure form of nature". (S. Moholy-Nagy 1950, 19) In his November 1923 lecture to Bauhaus students, Moholy-Nagy further extolled its virtues: "The Constructivism that is our new dimension has no other purpose than *to participate in life*. It is essentially one with the spirit of evolution that created science, civilizations, and the systems that govern social life." (Quoted in S. Moholy-Nagy 1950, 197)

Moholy-Nagy's colleagues at the Bauhaus in Germany further shaped his thinking, teaching, and practice. In particular, the views of the principal founder, Walter Gropius, of a "new architecture" and "new community" served as the starting point from which Moholy-Nagy evolved his concept for a "new individuality" (Findeli 1991, 40). As Hattula Moholy-Nagy noted, the social and ecological aspects of the Bauhaus dovetailed nicely with her father's own social idealism and his biocentric views. (H. Moholy-Nagy n.d.) In his introductory design courses at the Bauhaus, Moholy-Nagy assigned biology textbooks to his students. He and his Bauhaus colleagues saw the study of nature, its dynamic and organic equilibrium, as central to the utopian society they envisioned. But Moholy-Nagy's thinking and teaching evolved even further in the New Bauhaus curriculum where he emphasized more and deeper scientific courses, including physical, social, and biological sciences (Findeli 1995, 40; S. Moholy-Nagy 1950, 152–53).

Moholy-Nagy was heavily influenced by the work of the prominent American philosopher, Darwinist, and social commentator, John Dewey, a leading proponent of "pragmatism." Dewey was a frequent contributor to *The New Republic* and *Nation*, and was politically active in the women's suffrage movement and the unionization of teachers. Moholy-Nagy and Dewey first met in 1938 and Dewey ultimately became a sponsor of the School of Design founded by the former in Chicago. Dewey argued that man is a "Life Creature", and that the nature of experience is determined by the essential conditions and contexts of life (Dewey 1943). His book *Art as Experience* was a compulsory textbook

at the school and, together with *Experience and Nature*, formed much of the theoretical foundation and justification of Moholy-Nagy's design pedagogy at the New Bauhaus.

Moholy-Nagy frequently cited German writer and statesman Johann Wolfgang von Goethe, particularly his works on natural history, *Metamorphosis of Plants* and *Theory of Colors*. Most influential for Moholy-Nagy was Goethe's *Naturphilosophie* that challenged the purely mechanical taxonomy of plant life. Goethe's departure from the traditional, rational approach of articulating and testing abstract scientific hypotheses, resonated with Moholy-Nagy. Goethe saw science as an art and valued direct experimentation, believing that the solution to a problem lay in the problem itself, not within the experimenter (Findeli 1995). He argued that knowledge was best gained by immersing oneself in the natural phenomena to be studied, with all available senses. The influence of Goethe's humanistic epistemology is evident in Moholy-Nagy's writing in *Vision in Motion* (1947b) and in his practice-based design pedagogy.

Moholy-Nagy's views were also heavily influenced by Austro-Hungarian botanist, microbiologist and theosopher Raoul Francé (Botar 2010). During the interwar period, Francé was an active author and director of the prestigious Biological Institute in Munich. As an advocate of "psychobiology," Francé argued in *Germs of Mind in Plants* (1905) that plants, like humans, have a psychic energy, and sense of life, and purpose. Francé is recognized today as the founder of bionics, biomimetics, and biomimicry, the emulation of the models, systems, and elements of nature for the purpose of solving human problems. His theory of *Biotechnik* aimed to study nature's forms, functions, and structures and envisioned a "futuristic utopia," based upon natural principles and processes, for the design of human-made artifacts, architecture, and city planning. Francé was "a pioneer of the conception of the eco-system itself, indeed of systems theory in general." (Botar 2004, 528) Francé's work appealed to Moholy-Nagy and his desire "to find a design method that would set human life in harmony with nature's economy" (Anker 2010, 16). After encountering Francé's texts in the early 1920s, Moholy-Nagy's own writings became increasingly more biocentric. He frequently referenced Francé, highlighting *Biotechnik* in *Vision in Motion*, and quoted from *Plants as Inventors*, (Francé [1920] 1923) including in *Design Potentialities* (Moholy-Nagy 1944).[1]

Moholy-Nagy and renowned Finnish architect and designer Alvar Aalto met in 1929 in Switzerland during the Congrès internationaux d'architecture moderne (CIAM), a highly influential movement committed to advancing the cause of architecture as a social art to improve the world. Moholy-Nagy and Aalto developed a lasting relationship (Samuel and Menin 2003). In 1931, Moholy-Nagy visited the Aaltos and they traveled together to Lapland where he took a series of photographs of the indigenous Sámi people (fig. 1).

[1] *On Francé and Moholy-Nagy see Edit Blaumann's "Bios, Lobsters, Penguins: Moholy-Nagy's Vitalist Thinking from Francé to London Zoo" in the present issue.—Eds.*

FIGURE 1. *Carlo Hubacher's image of Moholy-Nagy filming, 1931. gta Archives / ETH Zurich, Hans Hubacher und Grete Hubacher-Knokke.*

The two designers' biology-informed perspectives were closely aligned and heavily influenced one another (Charitonidou 2020). Just as Francé's *Biotechnik* was pivotal for Moholy-Nagy, Baltic German biologist Jakob von Uexküll's concept of *Umwelt* was formative in Aalto's biocentric view of the relationship between nature and architecture (Charitonidou 2020).

While these influences are in no way exhaustive, they represent some of the key life experiences, people, philosophies, and movements that shaped Moholy-Nagy's thinking. Moholy-Nagy was not unique in his embrace of any one of these influences individually. For example, the concept of "biocentrism" was widespread among his peers. The rejection of anthropocentrism for a monist, neo-vitalist, holist, and more ecological view of the world was not uncommon among intellectuals in the late-nineteenth and early-twentieth century, especially in Central Europe (Botar 2010). It was Moholy-Nagy's ability to integrate a multitude of diverse influences into a systemic, life-centered design vision that is distinctly unique.

LIFE-CENTERED DESIGN: A BLUEPRINT

Through his art and design, teaching, and writing, Moholy-Nagy mapped out a blueprint for a life-centered design philosophy, pedagogy, and practice. He was holistic and integrative in his view of the whole of

life, combining many interests and disciplines. He called for artists and designers to anchor their work "in the complex whole" (Moholy-Nagy 1947b, 42), to embrace the "complexity of life," to be "integrators," recognizing the interconnectedness of art, economics, technology, and the social and physical sciences, in order to design for life:

> *Ultimately all problems of design merge into one great problem: "design for life". In a healthy society this design for life will encourage every profession and vocation to play its part since the degree of relatedness in all their work gives to any civilization its quality.* (Moholy-Nagy 1947b, 42)

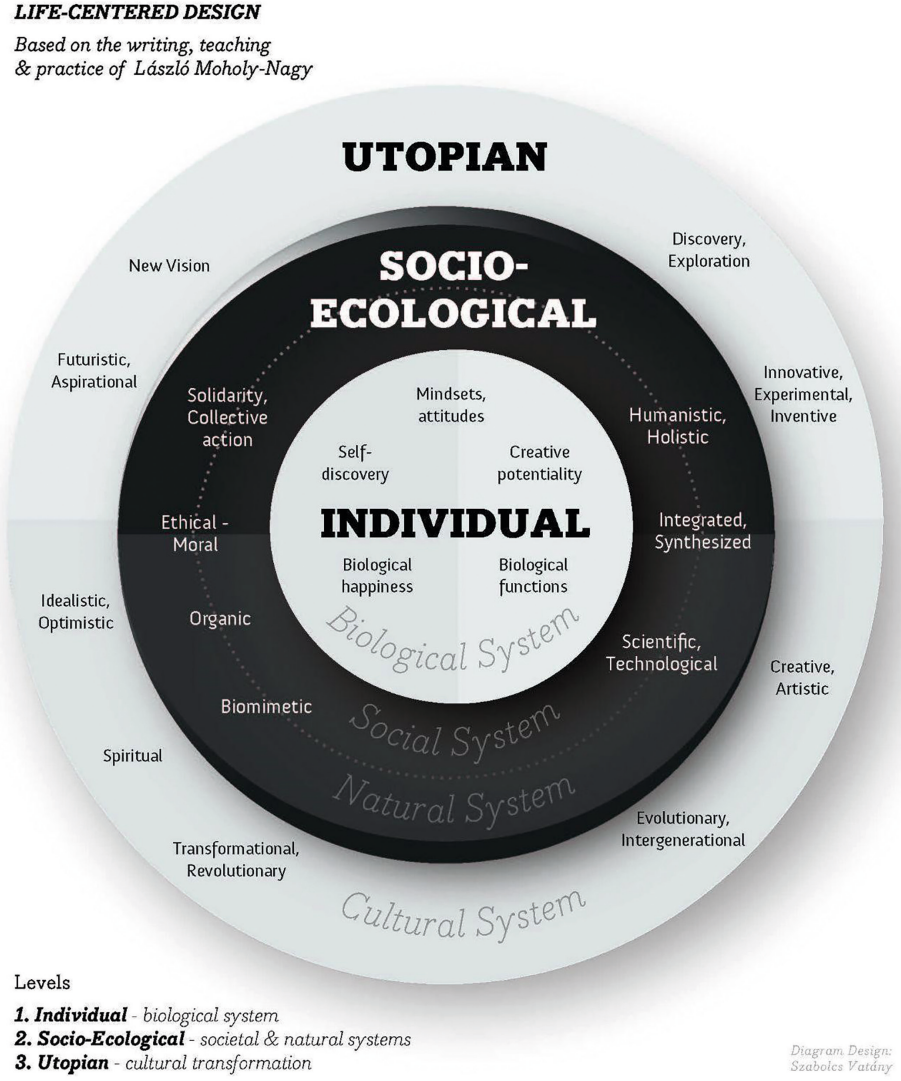

FIGURE 2. *Moholy-Nagy's holistic view of "design for life." Diagram by the authors.*

The above diagram (Fig. 2) endeavors to visually capture Moholy-Nagy's holistic view of "design for life", representing a synthesis of his vision across three, interconnected levels:

- ***individual level:*** At the heart of Moholy-Nagy's vision was the organic, biological self, the inner transformation and self-actualization of an individual's innate biological functions and latent aptitudes, intellectual and emotional powers, and creative potentialities. The development of an individual's attitudes, mindsets and senses were, he believed, a prerequisite to mastering "the whole of life".
- ***socio-ecological level:*** Moholy-Nagy saw the societal and natural systems as intertwined and inextricable. He advocated for a "new individuality" in design combining a greater sense of moral and social consciousness, responsibility, solidarity, and accountability. Simultaneously, he called for a more organic environmental and ecological perspective in design wherein man and nature live in harmony, health, and peace.
- ***utopian level:*** Moholy-Nagy envisioned design as an optimistic endeavor, constantly experimenting, exploring, and evolving new ideas. He was frustrated by the status quo. He was revolutionary and utopian in his views, calling for cultural, economic, and societal transformation, fundamentally new systems, policies, and ways of thinking and seeing.

Together these three levels represent Moholy-Nagy's holistic and systemic view of design as life-centered:

1) THE INDIVIDUAL: The Biological System

Moholy-Nagy was, according to Herbert Read, a "prophet of a new humanism" (Read 1935). In spring 1929, he was interviewed for *The Little Review* and is quoted as saying "I do not believe so much in art as in mankind. Every man reveals himself. Much of it is art." (Moholy-Nagy, quoted in Passuth 1985, 403–4) This supreme faith in man's ability to reveal himself in and through art (and design) represents the heartbeat of his life-centered design vision (S. Moholy-Nagy 1950):

> *From his biological being every man derives energies which he can develop into creative work.* Everyone is talented. *Every human being is open to sense impressions, to tone, color, touch, space experiences, etc. The structure of a life is predetermined in these sensibilities. One has to live "right" to retain the alertness of these native abilities.* (S. Moholy-Nagy 1950, 44)

In *The New Vision*, Moholy-Nagy used the term "biological" in reference to the laws of life that guarantee an individual's genuine and organic development (Moholy-Nagy 1933). He saw the individual as a whole biological organism, a system with five senses, all yearning for harmonious development. He believed that "children and very simple people" (S. Moholy-Nagy 1950, 71) are naturally attuned to and act more purely

according to the biological laws of feeling, sensation, and creative thought. "If you can extend the sensorial directness you had as a small child [...] into creative work with materials and relationships, you feel for the first time that you are a supreme individual." (S. Moholy-Nagy 1950, 167) But Moholy-Nagy believed that these primal human reactions and genuine biological functions were deformed and adulterated by societal pressures:

The creative human being knows, and suffers from the realization, that the deep values of life are being destroyed under pressure of moneymaking, competition, and trade mentality. He suffers from the purely material evaluation of his vitality, from the flattening out of his instincts, from the impairing of his biological balance. (Kostelanetz 1970, 167)

He expressed dismay with the overemphasis on mass production, market demand, specialization, and purely vocational training in design education, claiming that these stunted students' organic development. He proposed instead a pedagogy that laid "the organic basis for a system of production whose focal point is man, and not profit interests." (Kostelanetz 1970, 167) The student designer as human, as a biological individual, "the man in *toto*, in all his vitality and potentiality," he said, "must become the measure of all educational approaches." (Moholy-Nagy 1946, 3)

In his 1946 article, "New Education: Organic Approach" in *Art and Industry*, Moholy-Nagy strongly centers "the supreme individual" at the heart of design education and practice (Moholy-Nagy 1946, 5). This philosophy of self-actualization and potentiality was represented in the School of Design's approach articulated in a 1941 brochure that stated "educational policy is based upon the belief that talent is potential in everyone and that the function of education is to uncover it, activize it and develop it." (School of Design Summer Session Brochure 1941). Through deep, guided self-analysis, Moholy-Nagy believed, students could regain their natural "human powers," evolve an "individual plan of life," and "achieve a natural balance of intellectual and emotional power." (Moholy Nagy 1947a, 17, 15) He argued for the education of attitudes, mindsets, and the senses:

I love to dabble. That is what made me what I am today. I was educated as a lawyer, but because I dared to dabble with plastics and wood and so on, I gained a wide experience. Almost every educator, if he is sincere, tries to influence students to try the things he himself missed in his life or in his education. I was educated at a university as a so-called academist. That is how I found out I had a right to educate the senses *of people.* (Quoted in S. Moholy-Nagy 1950, 242)

While Moholy-Nagy placed the realization and potentiality of the individual at the heart of his pedagogical vision, he did not believe in the

individualistic, celebrity designer. Rather, he sought to place the individual "rightly within his community" and "in solidarity with the aims and requirements of a community." (S. Moholy-Nagy 1950) Moholy-Nagy believed that design education could foster a new individuality encouraging a sense of social responsibility and solidarity among designers and students. His philosophy and pedagogy advocated for economic, scientific and technological advancement not as goals in themselves but rather as means of achieving benefit for all and for the advancement of all life.

2) THE SOCIO-ECOLOGICAL: The Societal and Natural Systems

Moholy-Nagy saw societal and natural systems as intertwined and inextricable. Design was humanistic and humanitarian, he believed, and he called for greater humility among designers to submerge our egos into the collective whole. "Art has two faces, the biological and the social, the one toward the individual and the other toward the group." (Moholy-Nagy 1947b, 28) This "new individuality" he envisioned prioritized a greater sense of moral and social consciousness, responsibility, solidarity and accountability alongside a more organic environmental and ecological perspective in design. Man and nature should live in harmony. His references to the importance of "biology," therefore, had dual significance: first in the anthropocentric and humanistic sense of realizing the innate biological potentiality of human senses and improving the quality of collective human life and society; and second, in the ecological sense of designing according to the laws of nature wherein humans are a part of a wider ecosystem of life. As Peder Anker notes in *From Bauhaus to Ecohouse: A History of Ecological Design*, "Ecological designers were concerned about environmental problems in the household of nature as well as in the nature of households." (Anker 2010, 126)

Moholy-Nagy's overall aim "was to find a design method that would set human life in harmony with nature's economy as understood by Francé." (Anker 2010, 16) Moholy-Nagy had a strong mistrust of capitalism, driven by conspicuous consumption, industrialization, mass production, and popular culture (the penchant for fads, fashions, styles, and trends). Instead, he envisioned a new, more collective, organic, socio-economic system inspired by natural principles, form, and function.

Moholy-Nagy spoke strongly about humanity's abuse of nature, consumption, smoke polluted cities, and waste. (Moholy-Nagy 1947b, 55–56) He had a deep reverence for the environment, derived personal solace in nature, and elevated science and the study of nature in his design pedagogy and practice. He saw nature as "optimum" and as "the great designer," drawing creative inspiration from nature and from the simplicity of daily life. We know from his work and writing that nature served as a source of inspiration in his art and design, and a fundamental guiding principle of his work. (Fig. 3) The School of Design's summer session at the Somonauk school farm outside Chicago "became Moholy's greatest enjoyment," according to Sibyl Moholy-Nagy. "The abundant nature around us presented an unending variety of form and

function [...] When [the war] forced the discontinuation of the farm summer sessions in 1944, we felt we had lost one of the most joyfully rewarding aspects of our work" (S. Moholy-Nagy 1950,181–82). The pebbles, bones, bark, mushrooms, wasp nests, shells, and bird's eggs were "magnificent photographic material." She recounts too how, in 1940, during a cross-country drive, the frequent stops when "Moholy had spotted a 'photogenic' vista, and I melted patiently in 108 degrees heat while he recorded [...] every interrelationship of nature and technology." (S. Moholy-Nagy 1950, 180)

FIGURE 3. Fotogramm 157 *by László Moholy-Nagy. Moholy-Nagy created flower photograms throughout his entire career, from Berlin to Weimar, Dessau, London, and Chicago. Courtesy of the Moholy-Nagy Estate.*

"Scientific subjects" became an even more central element of the New Bauhaus pedagogy in Chicago. Moholy-Nagy added distinct courses and faculty in the life, physical and social sciences. Among these were classes in chemistry, geology and physics, and a biology faculty presenting a general overview of all living things, as well as the nervous system and sense perception of human beings. Moholy-Nagy also centered "Nature Study" in the new curriculum, drawing heavily from Francé, emphasizing the use of nature as a "constructional model" and

always looking for prototypes in nature. In *Vision in Motion*, he rues the use of the "cheap slogan" that "form follows function," claiming that it had lost its profound meaning in the capitalist system of consumption. But the statement was profound, he purported, if applied to phenomena occurring in nature, quoting Raoul Francé:

> *"[E]very process has its necessary form which always results in functional forms" […] Man has used the functional suggestions of nature innumerable times. Utensils, appliances, containers, tools are based upon his observation of nature. Nevertheless, "form follows function" translated into the human technology falls far short of the optimum which nature achieved in infinite applications.* (Moholy-Nagy 1947b, 44)

Moholy-Nagy was deeply drawn to Francé's concept of *Biotechnik*, referencing it in *Vision in Motion* with examples of pliers designed to mimic the gripping function of human fingers, a bomber plane that "resembles a giant, terrifying insect", the ornament of a wrought iron gate mimicking leaves, structural principles of skyscrapers mimicking the stalk of a plant (Moholy-Nagy 1947b, 44–45), and the biotechnical adaptation of a natural shell for corrugation (53). In "Design Potentialities", he referred to biomimetic inspiration in manufacturing and "streamlining" mass production of everything from airplanes to cards, ships and highways. A *Saturday Evening Post* reporter also recounted Moholy-Nagy's story of a class assignment he gave to his students to build a new style oven that would utilize infrared lights to cook. After cooking a chicken in one of the student's prototypes, Moholy-Nagy discovered that the wishbone of the chicken "is a beautiful piece of engineering, and offers a lot of good ideas as to making joints in plywood." (Yoder 1945, 89)

Moholy-Nagy believed that art and science fell short of fully capturing the perfection of nature: "All these experts aim at the closest possible imitation […] and they know they always fall short of their goal […] We're back where realistic painters started in the Renaissance—the imitation of nature with inadequate means" (S. Moholy-Nagy 1950, 105). He expanded on this in *Vision in Motion*: "After a million years of trial and error, nature has produced well-functioning shapes, but human history is much too short to compete with nature's richness in creating functional forms." (Moholy-Nagy 1947b, 33)

But Moholy-Nagy also believed that designers should go beyond simply mimicking natural forms. He argued for a deeper understanding of natural processes and systems and for integrating and modeling these in the design of new products, technologies, and social systems. "In designing for human consumption, function is not only a demand for a limited mechanical task; 'function' also includes the fulfillment of biological, psychophysical, and sociological requirements." (Moholy-Nagy 1947b, 44) As Peder Anker argues in *From Bauhaus to Ecohouse*, Moholy-Nagy sought not only inspiration from nature to solve human problems but

also reconciliation between the artificial and natural that would "both enhance human life potential and create a harmonious environment" for both human and nonhuman biological needs. (Anker 2010, 16–17)

3) THE UTOPIAN: The New Vision

In *Experiment in Totality*, Sibyl Moholy-Nagy refers to Moholy-Nagy as a "utopian" and "vitalist" (S. Moholy-Nagy 1950, 12). Writer Robert M. Yoder, in a 1943 *Saturday Evening Post* article, declared: "He's crazy." (17) Whatever the label, Moholy-Nagy was frequently ahead of his time and, as a result, also frequently misunderstood. He believed society was "anywhere from fifty to a thousand years behind the times" and saw his purpose to "break through old attitudes by ingenious practice" (Yoder 1943, 89).

Moholy-Nagy emphasized "potentiality" in design, seeing design education as a "laboratory," an exploratory process to experiment, make new connections, discover new possibilities. He celebrated the new inventions, patents, methods, tools, applications, and products that emerged from faculty and student workshops in the New Bauhaus. He held a long-term, futuristic view of change, advocating for slow and organic growth of ideas "over generations." But Moholy-Nagy's vision was not simply of incremental change, he was revolutionary and utopian in his views.

Moholy-Nagy is most recognized for his utopian views in his fine art, photography, and film. As one of the founders of the *Neues Sehen (New Vision)* photography movement in the 1920s, Moholy-Nagy's experimentation with light, shadow, unexpected angles, photomontage, and composition, represented a completely new way of interpreting photographic subject matter. In 1935, he was commissioned to do special effects for the futuristic science fiction film *Things to Come*, by H.G. Wells. The film speculated on future events up to the year 2106, and Moholy-Nagy imagined fantastic technology of the Utopian city of the future: "Houses were no longer obstacles to, but receptacles of, man's natural life force, light. There were no walls, but skeletons of steel, screened with glass and plastic sheets [...] a new reality rather than reality itself" (S. Moholy-Nagy 1950, 129). In *Experiment in Totality*, Sibyl Moholy-Nagy also recounts in a somewhat exalted tone a visit in 1935 between Moholy-Nagy and his friend Piet Mondrian, where they imagined a purer, future life amidst the agony and chaos of approaching war:

The two men on chairs were like seers [...] The chaos of the finite world had been left far behind. They were living a "future life—more real, more pure; with needs more real, fulfilled more purely by the harmonious relations of plan, line, and color." Optimistic, and serenely confident, they created a macrocosmic order of the absolute rectangle, endowed with magic powers more potent than the pentagram of old. (S. Moholy-Nagy 1950, 116)

This utopian perspective also manifested in Moholy-Nagy's design teaching and practice. Moholy-Nagy wrote of Utopia in *The New Vision*, expressing frustration with 180 years of "thinking about the problem, talking about it" and warning that only "partial solutions" and "partial rebellion" represents and addresses only the symptom (Moholy-Nagy 1933, 18). Instead, he called for "Utopians of genius" and "integrators" the likes of Leonardo da Vinci with "gigantic plans" who can synthesize all knowledge, integrate art, science, and technology, and join together through collective action, solidarity and "conscious collaboration" to lead to creative solutions. Sibyl Moholy-Nagy wrote of Moholy-Nagy's "vision of the totality of revolutionary design, and an unlimited willingness to work and to sacrifice for it." (S. Moholy-Nagy 1950, 22) Moholy-Nagy adopted botanist Raoul Francé's view of a "futuristic utopia" wherein the optimal functions of nature were applied to the development of new architecture, technology, and urban planning. Only then "humans would live in health and peace not only among themselves but also with the earth." (Anker 2010, 15)

CASES IN PRACTICE

The three cases in practice featured here represent examples of Moholy-Nagy's efforts in 1941–42 to contribute to the war effort and to address the bleak enrollment and financial state of the School of Design in Chicago. During the fall of 1941, more than half of the School of Design's students and teachers were conscripted into the armed services. Many school staff departed for factory jobs supporting the war effort and Moholy-Nagy moved quickly to develop a new strategy for the school to remain relevant, useful, and financially viable during wartime. The challenges he faced as the war effort widened also presented opportunities to demonstrate his vision of "designing for life." None of these cases alone fully demonstrates Moholy-Nagy's life-centered design blueprint in *toto*, but together they provide insights into how elements of it manifested through his practice and teaching.

1. Victory Springs

When the spring semester started at the School of Design in 1942, Moholy-Nagy faced growing shortages and prohibitively expensive studio materials, contracting enrollment, and a financial crisis. As Sibyl Moholy-Nagy recounted: "Plywood, photographic materials, metal, and paper rose in price and soon became unobtainable" (S. Moholy-Nagy 1950, 182). But these wartime austerity measures (especially the shortage of metal for civilian use) also led to opportunities for innovation in the school's workshops. Under Moholy-Nagy's leadership, students in the Product Design Workshop capitalized on their deep "knowledge of wood and its infinite adaptability" (S. Moholy-Nagy 1950, 183) to develop innovative wood products to replace war-

rationed metal, specifically for steel springs. Based on patents from the early 1800s and experimentation in the workshop, students developed twenty-four different prototypes made of thin strips of plywood that were then laminated and glued to create comfortable, rubberlike elasticity to mimic that of a metal box-spring. The resulting wood-spring design was named "Victory Spring" in reference both to the war effort and to the basic "V" shape of the spring, formed from hinging thin wood at alternate ends to form successive V's, folded upon each other in a zigzag fashion.

According to an October 1942 *Business Week* article, Moholy-Nagy claimed that the School of Design wooden spring design could simulate "any metal spring of any compression weight." ("Wooden Springs" Business Week October 31,1942, 35) He also referred to the technique in *Vision in Motion* as an example of his pedagogical approach to provide students with the "moral power" to improve upon and transform materials and technology to solve problems.

Tests on the wooden springs to mimic years of wear indicated they were "fully as durable as metal springs, and equally satisfactory in performance." ("Wooden Springs" 1942, 35) Unlike metal springs, they regained some of their elasticity and buoyancy after prolonged use. Moholy-Nagy featured the bed springs in *Vision in Motion* (1947b), and the springs' elasticity and comfort were further demonstrated in a photo that appeared in the July 1943 issue of the *Saturday Evening Post* (Yoder 1943), featuring the School of Design's janitor, Gus, taking a noon nap on the wooden springs prototype.

The wooden springs were also displayed at the July 1942 Chicago furniture show and ultimately patented by furniture manufacturing pioneer, The Seng Company. President Frank J. Seng provided $10,000 in working capital and created special machinery to produce the first nonmetal, all-wood bedspring. (S. Moholy-Nagy 1950). Moholy-Nagy worked with Seng to produce a simplified version of the spring design that was also less expensive to manufacture. But the economic viability of producing the wood-springs more widely proved difficult: "Unless someone bobs up with a design that permits production economies which as yet seems improbable, the cost differential is too great to enable wood to compete with wire, when metal again becomes available for civilian use." ("Wooden Springs" 1942, 36)

Despite the manufacturing limitations, the Victory Spring was recognized as ahead of its time. As Robert Yoder of the *Saturday Evening Post* put it:

> *It is Moholy-Nagy's idea that we are anywhere from fifty to a thousand years behind the times, and among the causes, he blames the habit of learning one field of endeavor, one profession or one craft and one alone. There are far too many specialists, he thinks.* (Yoder 1943, 16–17)

2. Occupational Therapy Course

Moholy-Nagy had a life-long interest in occupational therapy, psychology, and the therapeutic value of art and design. In both *Malerei-Photographie-Film* and *The New Vision*, Moholy-Nagy explored the psychological blockages to an individual's biological creative potentiality. In *Vision in Motion*, he extolled the effectiveness of creative expression as a means of recovering a student's "all-embracing biological potency" (Moholy-Nagy 1947b, 72). Through a process of "self-testing" and guided exploration, he believed an individual could uncover her / his innate potentiality, "his 'best'". (73) In 1943, Moholy-Nagy saw an opportunity to apply this philosophy and process, which was at the heart of the New Bauhaus pedagogy, to the war effort in service of the rehabilitation of handicapped veterans. In his strategy memo "New Approach to Occupational Therapy," he emphasized the urgency and lasting need for rehabilitation (both physical and psychological) during the war and long after the armistice. (Moholy-Nagy "New Approach", 1)

In collaboration with numerous partners in medicine, psychiatry and occupational therapy, Moholy-Nagy scoped out a strategy for the School of Design to create a rehabilitation therapy process for army, navy and air force veterans and injured industrial workers. The series of seminars, symposia and classes offered at the School of Design would benefit not only veterans and workers themselves but also their doctors, nurses, therapists, and clinical administrators. He outlined a comprehensive strategy for the new program. The vision involved new techniques and types of occupational therapy hospitals and medical supervision alongside an experimental "laboratory school" and research department. Such a center would resemble a university campus more than a hospital (Moholy-Nagy 1943a). The laboratory would offer vocational guidance and occupational training for patients, and psychotherapy for patients and their therapists / teachers integrating the arts, science, and technology.

Moholy-Nagy's rehabilitation vision emphasized "conditioning to creativeness," involving experimentation with sensory experiences, starting with the skill of the fingers, the hands, the eye and the ear, and their coordination. This was accomplished through so-called "tactile charts" with purposefully organized textures (Moholy-Nagy "New Approach" 6) that Moholy-Nagy had tested at the School of Design with blind people (fig. 4)

Moholy-Nagy made appearances at various medical conventions to promote his vision for rehabilitation. But he met with resistance from institutions mired in a system of bureaucracy and tradition that relied on "charity" and "the old sentimentality toward the 'crippled'" (Moholy-Nagy 1943a, 3) as the means of rehabilitation:

[T]he appointed guardian angels of the crippled and the handicapped didn't like Moholy's ideas. They resented his efforts to take

FIGURE 4. *Blind people testing tactile charts and hand sculptures at the School of Design in Chicago. Photographer unknown. Source: László Moholy-Nagy. 1943 "Better Than Before."* The Technology Review *46 (November): 45–48.*

rehabilitation out of the grasp of charity […] Wounded veterans had to keep on listening to the benevolent ladies who considered basket-weaving or lamp-shade decorating adequate work for a mature man. (S. Moholy-Nagy 1950, 184–85)

Moholy-Nagy believed that occupational therapy needed to move beyond this "charity atmosphere" and sentimentality. (Moholy-Nagy "New Approach", 2) In his November 1943 article "Better Than Before", he challenged the status quo, positing that the existing system of rehabilitation focused on curing of symptoms rather than the elimination of causes:

The industrial age, focusing its interest in exploitation of nature's wealth and in production of goods, did not consider too thoroughly the biological, physiological, and psychological requirements of the individual, his need for a balanced program of work, recreation, and leisure […] The new aims for rehabilitation have to take into account this general situation. (Moholy-Nagy 1943a, 3)

Moholy-Nagy argued that "new situations required new attitudes" and that a new plan and legislation for rehabilitation needed to be based upon "high social responsibility" and upon scientific and technological innovations, "contemporary thinking and practices, without traditional fixations." (Moholy-Nagy "New Approach", 2.) He believed that every person "has a variety of potential talents differing only in degree" (Moholy-Nagy 1943b) and a patient needed to be stimulated by

"a well-rounded program in order to activate him to a full evaluation of his own situation." (Moholy-Nagy "New Approach", 2) Through a design-driven rehabilitation, Moholy-Nagy posited, a handicapped individual could not merely earn a livelihood but reincorporate "as a creative and responsible member into society" (Moholy-Nagy 1943a, 5), by awakening his "full productive capacity" and gaining a "self-reliance he never had before" (Moholy-Nagy 1943a, 7).

Moholy-Nagy's new vision for rehabilitation was considered too expensive by some critics. But he argued that his approach was not only "more humane" but more economical in the long run. "It would produce better, more balanced citizens with greater earning power and less welfare costs." (Moholy-Nagy "New Approach", 3) Moholy-Nagy was unable to realize his wider rehabilitation vision prior to his death but his ideas had a lasting influence. In 1944, for example, Victor D'Amico, director of the Department of Education at the Museum of Modern Art (MoMA), outlined a national strategy for using art to resocialize veterans at MoMA's new War Veterans' Art Center, inspired by Moholy-Nagy's rehabilitation pedagogy (Turner 2015).

3. Camouflage Workshop & Exhibition

On December 19, 1941 (only twelve days after the Japanese attack on Pearl Harbor), Moholy-Nagy was appointed to the Mayor's staff in charge of camouflage activities for the Chicago area. He was charged with helping conceal Chicago in case of an enemy aerial attack. Sibyl Moholy-Nagy recounted "long meetings with the local Office of Civilian Defense" (S. Moholy-Nagy 1950, 189). He took flights over the city in diverse weather conditions (S. Moholy-Nagy 1950, 183–84) to imagine creative ways to disguise buildings, conspicuous structures, and natural landmarks, to make them more difficult for enemy aircraft to recognize or use for navigation. Moholy-Nagy's attention and that of friend and fellow teacher György Kepes turned to exploring the psychology of light and color perception, and how various visual elements could be applied to camouflage techniques. In his 1946 article, "New Education: Organic Approach", Moholy-Nagy recalls finding inspiration for the camouflage project by adapting the principles of the European avant-gardists Mondrian, Malevich, and others. (Moholy-Nagy 1943, 6)

In January 1942, the School of Design became a certified school for camouflage personnel and, with sponsorship from the Office of Civilian Defense, Kepes led a Camouflage Workshop with students to produce and test a wide range of new camouflage techniques and concepts. The workshop served as both training for students, teachers, and volunteers in civilian and military camouflage techniques, as well as a laboratory to develop new camouflage ideas. "Camouflage is the art of deception", Kepes said in his opening lecture (Kepes 1942). He and Moholy-Nagy arranged a series of lectures covering topics ranging from: the fundamentals of visual perception; typical problems

FIGURE 5. *School of Design student Barbara Jeanmaire presents at an exhibit of ideas generated in the camouflage course led by Moholy-Nagy and György Kepes. Photographer unknown. Courtesy of the University Archives and Special Collections, Paul V. Galvin Library, Illinois Institute of Technology*

FIGURE 6. *Moholy-Nagy's camouflage course at the School of Design generated numerous ideas for camouflage techniques inspired by animals and patterns in nature. Photographer unknown. Courtesy of the University Archives and Special Collections, Paul V. Galvin Library, Illinois Institute of Technology*

in camouflage; study of camouflage inspiration from animals and natural landscape; and various camouflage applications (e.g., structural camouflage, surface coverings, smoke devices, and use of artificial light patterns) (Iguchi 2018).

In September 1942, Moholy-Nagy and Kepes co-wrote a series of articles in *Civilian Defense* magazine. In Part 3 of the series, entitled "Materials for the Camoufleur," they offered up techniques for putting camouflage into action, sharing their research and prototypes for disguising important structures and landmarks. In 1943, the pair also organized a well-received and widely promoted *Camouflage Exhibition* at the School of Design to display the workshop innovations (figs. 5–6).

The exhibition featured concepts for disguising airports; concealing the vast Lake Michigan with a simulated shoreline and floating islands; a technique for concealing a cylindrical target (like a silo or propane tank) using painted patterns that trick the eye from a distance (Campbell-Dollaghan 2013); and an application of disruptive painted patterns to urban buildings that would appear in enemy bombsights as a number of smaller innocuous objects rather than a single large structure of significance (S. Moholy-Nagy 1950, 183).

In 1943, Moholy-Nagy also produced a film, *Work of the Camouflage Class*, documenting examples of student work presented in the exhibition, including models of camouflaged buildings and aerial photographs of cities and residential complexes modified through abstract painting to appear invisible from the air. (Hiller 2019) The film features a bird's-eye view of a building that is painted with geometrical patterns

resembling streets on the ground, to make it impossible to identify the underlying structure of the building (fig. 6). This visual technique, using optical illusions to change human perception, was based on Gestalt psychology (Iguchi 2018).

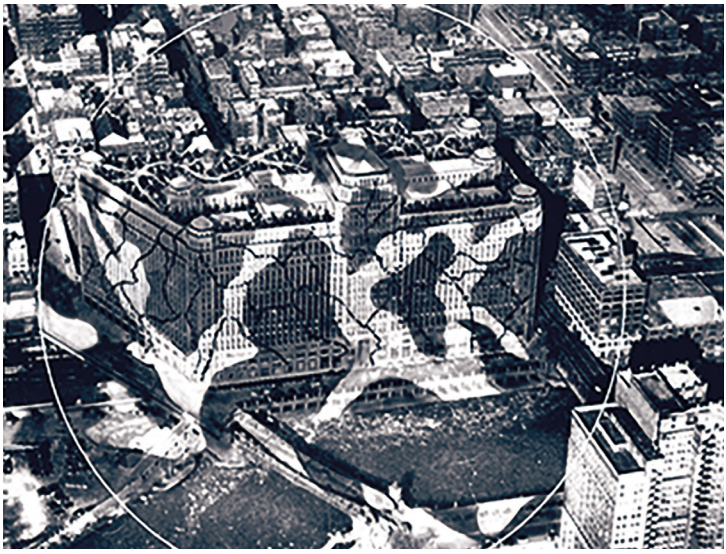

FIGURE 7. *Still from Moholy-Nagy's 1943 film* Work of the Camouflage Class. *Courtesy of the Moholy-Nagy Estate.*

Also included in the film are biomimetic camouflage patterns derived from the animal and plant world and applied to military vehicles and uniforms. The first article in Moholy-Nagy and Kepes's series for *Civilian Defense* magazine in June 1942 also showed examples of these nature-inspired camouflage patterns. In his 1944 book *Language of Vision,* Kepes references the nature-inspired camouflage innovations that emerged from the workshop: "The numerous optical devices which nature employs in the animal world to conceal animals from their enemies reveal the workings of this law [i.e., perceptual grouping] of visual organization." (Kepes 1945, 45)

These three cases alone do not fully demonstrate Moholy-Nagy's life-centered design blueprint. But collectively they do provide some insight into how elements of his life-centered vision manifested in his teaching and practice. All three cases were initiated by Moholy-Nagy to contribute to the war effort and are therefore strongly anchored within the socio-ecological level, aligned with his belief in a "new individuality where designers work in solidarity for the collective good (notwithstanding Moholy-Nagy's motivations were also somewhat self-serving as the School of Design's work in wartime was also intended to save the institution from decreasing enrollment and financial ruin). Individually, each case gives a snapshot of the life-centered vision as they traverse one or more of the three levels (individual, socio-ecological, and utopian) and one or more of the four systems (biological, social, natural, and cul-

tural). The Victory Springs project, for example, is more product-focused, involving transforming wood to mimic metal springs. The occupational therapy project proposed an entirely new approach to psychotherapy through sensory conditioning as well as a new proposal to transform the entire system of charity-based rehabilitation in the service of war veterans and injured workers. And the camouflage project utilized new visual techniques and technology, and psychology and biomimetic inspiration in service of the collective effort to deceive the enemy.

These individual cases also give insight into how Moholy-Nagy's broader vision for a "parliament of social design" might manifest in practice. In the closing of *Vision in Motion*, he proposes a laboratory campus of diverse experts and disciplines—including physics, chemistry, biology, botany, zoology, bacteriology, agriculture, and forestry alongside anthropology, economics, public health, political economy, and government, among others—"united and synthesized into a coherent purposeful unity focused on sociobiological aims" and working together in an "integrated system through cooperative action" to address a myriad of problems and to "prepare new, collective forms of cultural and social life for a coming generation." (Moholy-Nagy 1947b, 359, 361) This integrated laboratory system, he believed, "could serve as the intellectual trustee of a new age in finding a *new unity of purpose*; not a life of metaphysical haze but one based upon the biological justice to develop all creative capacities for individual and social fulfillment [...] It could translate Utopia into action." (361) What is unique about Moholy-Nagy's life-centered vision is not the individual inspirations or levels but rather the connections and integration he envisioned between and among them. This systemic view is what he saw as the differentiating opportunity for artists and designers:

The actual aim is sociobiological synthesis. This cannot be achieved without "laboratory experimentation [...] Although the 'research work' of the artist is rarely as 'systematic' as that of the scientist they both may deal with the whole of life, in terms of relationships, not of details. In fact, the artist today does so more consistently than the scientist, because with each of his works he faces the problem of the interrelated whole while only a few theoretical scientists are allowed this 'luxury' of a total vision." (Moholy-Nagy 1947b, 31)

CONCLUSION

As social design educators and practitioners look to the future for guidance on reimagining design education and practice to address the simultaneous crises of the global pandemic, a climate crisis, economic and racial inequities, and political divisiveness, the authors believe that looking to the past, and in particular to Moholy-Nagy's conception of "designing for life", provides a rich and relevant blueprint for the future. It also challenges us to question the anthropocentric view that domi-

nates design discourse, pedagogy, and practice today. The life-centered design vision outlined here was not presented by Moholy-Nagy himself in this exact form or with this exact terminology. But it draws directly from his own (and his family's) words, from his prolific writing and correspondence, from the myriad of influences that shaped his thinking, from his design teaching and pedagogy, and from cases of his work in practice. Collectively these reveal that Moholy-Nagy embraced life: the simplicity and beauty of living daily life, life as an individual and collective endeavor, the complexity of life, life as a guiding principle, life as creative inspiration, the majesty and diversity of all (not only human) life in nature. It reveals a holistic, integrated, and idealistic vision about the ethical and moral responsibility of designers to celebrate all life, to realize their own individual creative potentiality, to act with humility in solidarity with others and in alignment with the wisdom of nature. And it reveals a visionary approach, one that was ahead of its time with revolutionary, transformational, utopian ideas for new ways of thinking, doing, and seeing, and for reimagining social systems in harmony with nature.

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