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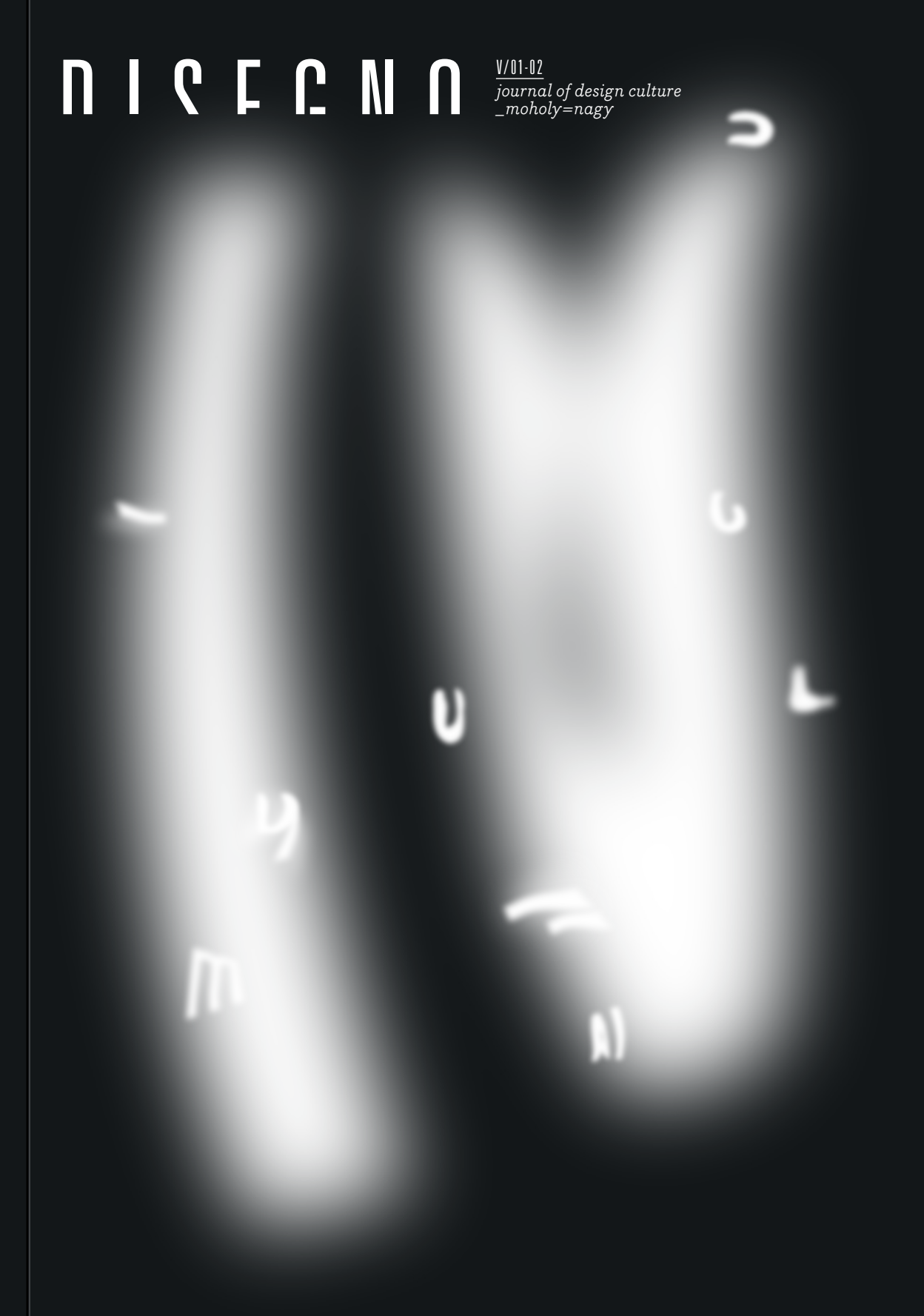

Disegno

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.

Contact: *Moholy-Nagy University of Art and Design*
H-1121 Budapest, Zugligeti út 9-25.
Editors: disegno@mome.hu

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BIOS, LOBSTERS, PENGUINS:

MOHOLY-NAGY'S VITALIST THINKING FROM FRANCÉ TO LONDON ZOO

Edit Blaumann

ABSTRACT

In this essay I will examine how László Moholy-Nagy's relationship to biology evolved and how the beginnings of ecological design underlying the Bauhaus's modernity project were outlined in two movies shot during his London years. Two documentaries, the Lobsters *and* The New Architecture and the London Zoo *directly address the relation between animals and humans. The narrative of the documentaries, their camera work and the contemporary reception of them reveals a lot about the reconfiguration of Bauhaus ideology as a blueprint of ecological design during the emigration to the United States. We can trace Moholy-Nagy's approach to "design according to the laws of nature" back to the impact of Raoul Francé's concepts of* Biotechnik, *the notion of Bios and his monist beliefs, which were already present in his worldview during the Weimar years of the 1920s. The difference between the English edition of his design method and pedagogy book* New Vision *(1938) and the original* Von Material zu Architektur *(1929) clearly demonstrates the shift towards biological functionalism. Aiming to establish harmony between human life and the biological forces of nature and he asserted that a well-functioning biotic community is the precondition for a well-functioning human society. Even if he only indirectly argued for ecological protection in that early stage of ecological awareness, Moholy-Nagy wrote his name in the history of ecological design.*

#biocentrism, #biological functionalism, #ecological design, #vitalism, #London Zoo

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In the work of the Bauhaus and Moholy-Nagy, biological thinking was never fully expressed in architecture as literal copying of nature, biomimicking, and curvilinear biomorphic forms and structures. Nevertheless, and as Oliver Botar has shown, through various influences biocentrism and the biofunctionalism permeated the thinking of all schools of the Bauhaus (Botar 2017, 17–51).[1] These tendencies were precursors of today's ecological thinking and design (Kallipoliti 2016). According to Peder Anker, besides the Central European influences of proto-environmentalism, Moholy-Nagy encountered different circles in London advocating environmental sensitivity after fleeing the Nazi's harassment. There, he created two documentaries directly linked to the animal kingdom, and which reflect his vitalist worldview. The search for biological harmony can be traced in his pedagogical program and in his writings. In this essay, I will track down the infiltration of biological thinking into Moholy-Nagy's life and oeuvre, and itspresence in his two London documentaries, *Lobsters* and *The New Architecture of the London Zoo*.

PROTO-ENVIRONMENTALISM

To have a clearer understanding of the early appearance of the environmental thought in the Bauhaus I will briefly trace its origins from the end of the nineteenth century until the 1920s when Moholy-Nagy first encounters it. This period is often described as the first stage of environmental thought, as proto-environmentalism or as "the awakening" (Jamison 2001, 82). As Bramwell argues, ecology has its roots in rational scientific movements as well as in the romantic anti-scientific, and anti-industrial movements. (Bramwell 1989, 37–63) Romanticism can also be understood as a reaction to the rationality of Enlightenment since romanticism "is widely associated with both the cult of nature and profound spirituality" (Bennett 1999, 124), and expresses enthusiasm for localism and the interest in vernacular culture. This is an area where scientific progress is accompanied by a moral and philosophical reconsideration of the relationship between man and nature (Bramwell 1989, 37–63). Here already, ecology has evolved from a life science into a political or ideological program.

[1] *Due to certain ties to National Socialism, this aspect has been largely overlooked by researchers. The school itself was decidedly on the anti-Nazi side, but there were some Nazis who supported the Bauhaus because it was a centre of biocentric thought (Botar 2017, 17). Besides Oliver Botar and Peder Anker only a few researchers recognize Moholy-Nagy's biocentrism, like Alain Findeli, who calls Moholy-Nagy's oeuvre a kind of organic, or vitalist functionalism (Findeli 1990, 10) or Andreas Haus, who was the first author to point out Moholy-Nagy's biocentrism, and who sees Moholy-Nagy shifting from a dialectical and revolutionary organicism towards one co-opted by John Dewey's concept of harmonious society (Haus 1983, 113–4). Alan Powers' recently published book* Bauhaus Goes West *also stresses the importance of Moholy-Nagy's biocentric worldview (Powers 2020).*

ECOLOGY

The term "ecology" was coined by the German zoologist and philosopher Ernst Haeckel in 1866 to describe the "economies" of living forms (Bramwell 1989, 39). In his *Generelle Morphologie* (1866), he produces a revolutionary synthesis of Darwin's ideas with the German tradition of *Naturphilosophie* going back to Goethe and the progressive evolutionism of Lamarck. Beside his scientific career, Haeckel was an accomplished artist, and he developed an exquisitely detailed illustration method for his scientific findings. His work also provides an important link between ecology and aesthetic. His work directly informed the early manifestations of ecology in architecture, the art nouveau movement which made use of natural motifs and biological forms. His influence is clear in the form and the decoration of René Binet's Porte monumentale, which was designed for the 1900 Paris Exhibition. Binet was also influenced by Haeckel's Monism and cosmic synthesis unifying science, art, and religion (Proctor 2006, 148). Haeckel saw biology as a discipline that could be the foundation of a scientific religion (Haeckel, Breidbach, and Hartmann 1998, 24). In the early part of the twentieth century, Haeckel joined with others and formed the Monist League,[2] evidence he believed biological research is connected to political, social and spiritual questions. In his writings we can find collected the most important ecological themes of the epoch: naturalism: seeking truth in nature rather than human constructs and abstractions; vitalism: the idea of a life force; and holism: the belief that the universe and especially living nature should be understood in terms of interacting wholes that are more than the mere sum of elementary particles (Lewis 2019, 108–9). (Fig. 1)

[2] *Monism rejects such dichotomies as mind vs. matter or reason vs. emotion, because they are not helpful in understanding complex systems as life. Monism is a framework for understanding the world as a single reality without the need for religion.*

BIOCENTRISM

Biozentrik (biocentric) is the German term that Botar adapted for the early twentieth century Central European worldview, which is based on Darwinism, neo-Lamarckism, biological determinism, Nietzscheanism, and a materialist romanticism of Nature, and which rejected anthropocentrism in favor of a monist, neo-vitalist, organicist/holist and ecological world view (Botar 1998, 7–9). Although the concepts and beliefs within these narratives are not identical, we can nevertheless recognize similarities between them. They all privilege biology as the source for the paradigmatic metaphor of science, society, and aesthetics, which we call biologism. Biologism is a consistent biological-based epistemology and even a psycho-biology that emphasizes the centrality of nature, life, and life-processes over culture. The above-mentioned narratives all share an anti-anthropocentric worldview; they believe in the self-directedness and unity of all life, in other words, in the cosmo-vital feeling of unity or *Vitalmystik* (vital-mysticism). They all accentuate change, diversity and variability in nature over permanence; and a concern for "whole-ness" as opposed to reduction (Botar 2017, 18).

FIGURE 1. *Plate no. 63 from the 1904 edition of Ernst Haeckel's* Kunstformen der Natur. *Leipzig: Verlag des Bibliographisches Instituts. Author's archive.*

The major German lifestyle and pedagogic movements of the epoch, such as the *Reformbewegung* or *Lebensreform*, the movement for life reform, or the (educational) reform movements were also permeated by the nature-centred ideas stemming from the abovementioned discourses. (Botar, 2016, 20)

The members of the Bauhaus were touched by these ubiquitous ideas of the time, and various threads link them to these movements. The school itself was more than the stronghold of rational, formalist, technocentric, anti-natural objective positivism. Biocentric attitudes—as well as esoteric ones during Itten's period—were inherent to it. Essential components of Biocentrism persisted throughout all the Bauhaus periods (this is clear in the case of some professors, such as, Oskar Schlemmer, Paul Klee, Wassily Kandinsky, Lothar Schreyer, and Herbert Bayer).

László Moholy-Nagy's first recorded encounter with Biocentrism was through his first wife Lucia Schulz (the future Lucia Moholy) who participated in the biocentric wing of the *Lebensreform*'s youth movement, until 1919. She and Moholy-Nagy spent summers together in the circles of prominent pedagogic leaders of the movement and made long term friendships with them. Arguably the most important source for Moholy-Nagy was his compatriot, Vienna-born, Budapest-raised biologist and popular philosopher Raoul (Rezső) Francé. After Haeckel's death in 1919, Francé became one of the most influential intellectuals professing a biologistic worldview in Central Europe. He invented the term *Biotechnik* (biotechnique), which we now call bionics or biomimetics. In his view, all technologies (natural and human) are based on the *Bios*, the world as the sum of our sensory perceptions. He suggested that humans should learn from the organic technology of nature and benefit from adapting it for their own purposes. He linked the biocentric attitude to techno-optimism. He saw technology as an integral part of nature and therefore as something that does not necessarily destroy it. In his popular book *Plants as Inventors* Francé methodically analyzed plants and the possibilities they offer to solve technical problems. He stressed that radical functionalism is innate in nature and its technologies: "All must have its best form, its 'optimum' which is also its nature at the same time [...] There is for everything, be it a concrete thing or a thought, only one form that corresponds to the nature of that thing." (Francé [1920] 1923, 11) (Fig. 2)

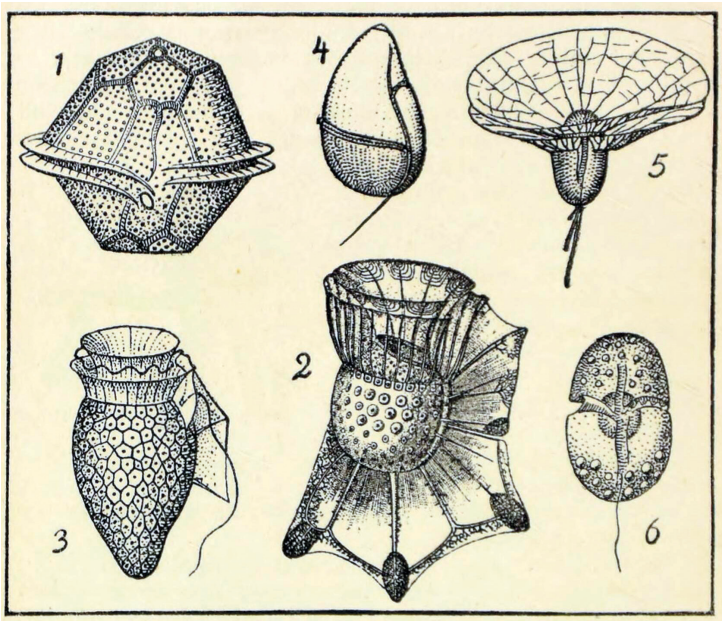

FIGURE 2. *"Peridinae of the Sea as Natural Turbines" from page 30 of Raoul Francé' book* Plants as Inventors. *1923 (1920) New York: Albert and Charles Boni. Author's archive.*

According to him, all forms of nature are organic because they are the product of selection (evolution) and a necessary consequence of the functions inherent to it, consequently, for any given biological problem there is a unique and optimal form that provides the solution.

Like El Lissitzky, Kurt Schwitters, Hannes Meyer, Werner Graef, Hans Richter, and Mies van der Rohe—all Berlin-based international constructivists of that time—Moholy-Nagy probably encountered Francé through the January 1923 publication of an excerpt from *The Plants as Inventors* in the art journal *Das Kunstblatt*.[3] Francé became a principal source of inspiration for biocentric Constructivism as Botar calls it (Botar 1998, iii). Francé's writings had a profound impact on Moholy-Nagy's understanding of function as the source of all form, shortly after Gropius hired him at the Bauhaus in the same year.

In Moholy-Nagy's *New Vision* we find traces of Francé's concept of *Bios*, "the message[s] of an inexhaustible cosmic energy he tried to decode" —"[h]e was Utopian, I a historian; he the vitalist and I the humanist" as Sibyl Moholy-Nagy recalled ([1950] 1969, xviii, xi).[4] His interest in technology and its creative possibilities has mostly been viewed as evidence of a purely technocentric approach. Even in 1996 Rainer Wick, the German art historian, states: "A half century after his death, the fascination with László Moholy-Nagy as the prototype of the progressive, avant-garde, techno-optimistic and media-optimistic artist is still unbroken." (Wick 1996, 61–62) But in light of *Bios* we may recognize Francé's influence on Moholy-Nagy's approach to technology and art:

Technical progress is a factor of life which develops organically. It stands in reciprocal relation to the increase of human beings in number. That is its organic justification […] we can no longer think of life without such progress. (Moholy-Nagy 1930, 12)

As for the question of *art*: similar to how Francé understands ecosystems as the optimal expression of interacting elements, Moholy-Nagy wrote that "art" is created when expression is at its optimum level, "when at its highest intensity it is rooted in biological law, purposeful, unambiguous, pure" (Moholy-Nagy [1925] 1969, 17). The appearance of the "biological law" marks the emergence of ecological thinking in Moholy-Nagy's approach to the world and to art, which will continue to evolve in the years to come. It is clear that his relationship with biology, which is henceforth linked to the notion of technology in the field of creation, continues to evolve. As a result of the above-mentioned influences, he moves step by step closer to the concept of ecology as we know it today, and to biodesign, which we need to incorporate into the design of today and tomorrow.

[3] *Francé never became an open supporter of the Bauhaus, but he did come into direct contact with it. In 1923 Francé not only visited the* Bauhaus Exhibition *but also spent an evening with Gropius, who explained to him the Bauhaus pedagogical principles. Francé had left Germany for Austria by 1924. (Botar, 2003–2004, 58).*

[4] *She also referred to her husband's sacrifice of his artistic career for his commitment to teaching, as dictated by "biological law," "because it was bios—the interaction of vital impulses, that stimulated man to work for his emotional fulfilment." (S. Moholy-Nagy, xviii)*

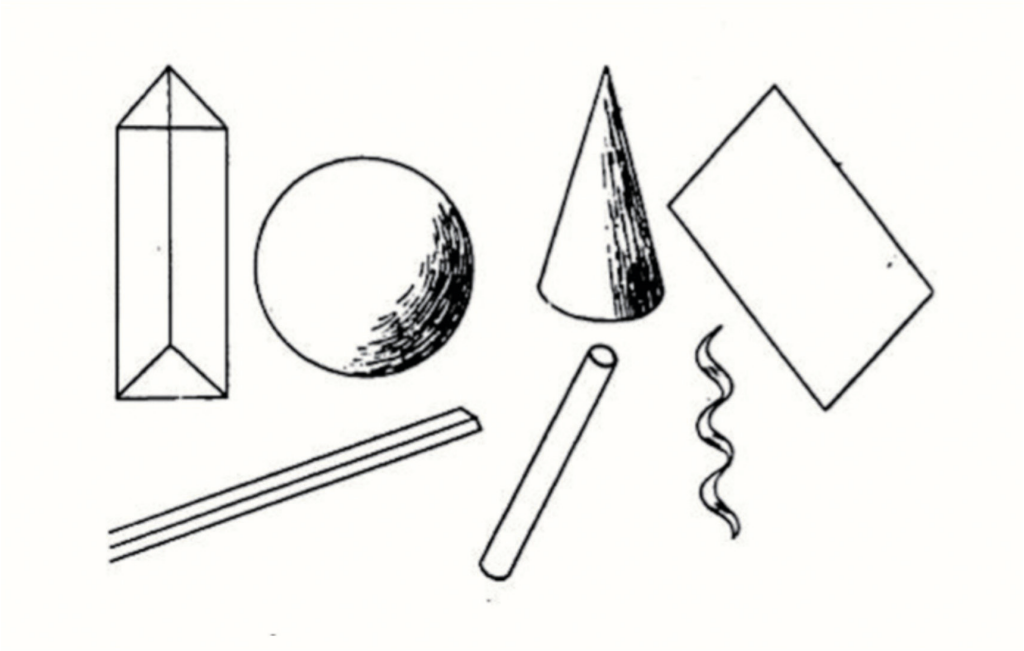

FIGURE 3. *Moholy-Nagy's drawing of the seven biotechnical elements after Francé: crystal, sphere, cone, plate, strip, rod, and spiral (screw) from page 46 of* The New Vision*'s 1947 edition (New York: Wittenborn, Schultz, Inc). Author's archive.*

Francé conceived of the world as an interlocking, interdependent ecosystem, aiming to find a balance, and what he called the "integrated harmony of nature" is a model that benefits both society and culture. Likewise find the same vitalist terminology in Moholy-Nagy, who seeks the unity of culture as opposed to its over-specialization:

What we need now is not the 'Gesamtkunstwerk' *[separated from life], but a synthesis of all the vital impulses spontaneously forming itself into the all-embracing Gesamtwerk (life) which abolishes […] isolation, in which all individual accomplishments proceed from a biological necessity and culminate in a universal necessity.* (Moholy-Nagy [1927] 1969, 17).

Moholy-Nagy believed that while in the design of machines, man often accidentally found solutions that later turned out to have natural antecedents, it is still possible to create "organically functioning" works that have no such natural antecedents. The point is to follow the general principles of nature's methods, and this is the essence of the biotechnics (Steadman 1979, chap. 10) "In all fields of creation, workers are striving today to find purely functional solutions of a technical-biological kind: that is, to build up each piece of work solely from the elements which are required for its function." (Moholy-Nagy 1930, 54)

Moholy-Nagy also noted and illustrated how all processes in the world develop according to the following seven fundamental technical forms: the crystal, sphere, cone, plate, strip, rod, and spiral (screw),

making reference to the *Funktionsgesetz* (function law) aspect of the concept of *Biotechnik*: "The laws of the least resistance and economy of action force equal actions to lead to the same forms, and force all processes in the world to develop according to the law of the seven fundamental forms." (Francé [1920] 1923, 23) (Fig. 3) In the introduction to the American version of *The New Vision*, Moholy-Nagy inserted a new section entitled "Biological Needs".

In this book the word "biological" stands generally for laws of life which guarantee an organic development. If the meaning of "biological" were a conscious possession, it would prevent many people from activities of damaging influence […] The oncoming generation has to create a culture which […] strengthens the genuine biological function (Moholy-Nagy 1938b, 13–14).

The importance of his ecological approach is further enhanced in this passage where the biological is equated with the basic laws of life. In addition, awareness and non-harm are emphasized. Moholy-Nagy also challenges future generations to create a healthy culture focused on biological functions.

THE LONDON YEARS

In this new introduction, the biological and related terms occur much more frequently than in the previous versions. After fleeing Germany to escape the Nazi harassment and before arriving in the United States, Gropius considered Britain as a potential new home for the school and having the best prospects for work. Gropius, Moholy-Nagy, Breuer and Bayer tried to re-establish the school in London between 1934 and 1937. They settled in the leafy London borough of Hampstead, at the time the heart of the avant-garde community of artists and intellectuals. Businessman Jack Pritchard offered his newly built "Lawn Road Flats" (later known as the "Isokon Flats") as a temporary, rent-free residence for them and a common room for the faculty. Gropius described the place as "a socially and technically exciting housing laboratory" where tenants, mainly intellectuals and designers, often gathered. Coates, the architect of the building, was at the heart of these gatherings, and he and other colleagues soon formed the MARS Group (Modern Architecture Research Group). Moholy-Nagy began collaborating with them on the design of the influential MARS exhibition of 1938 (Carullo 2017). In the exhibition's manifesto, MARS proclaimed environmental sensitivity: "There must be no antagonism between architecture and its natural setting" and "the architecture of the house embraces the garden. House and garden coalesce, a single unit in the landscape." Some of these architects were introduced to Bauhaus research methods through the English-language publication of *Von Material zu Arkitektur*, published in New York in 1930 under the title

The New Vision (Summerson 1957, 308). At the time American books did not cross the ocean as easily as they do today, as the journal *Shelf Appeal* noted "instructors and lecturers in Art Schools in this country have little likelihood of seeing it" (Anon 1935, 38). In late 1938, the publishing company Faber & Faber purchased 520 sets of printed pages from the American edition, and the book was published under its imprint the following spring. It was advertised as the first in a series of "New Bauhaus Books", but subsequent editions, and therefore more information about Moholy-Nagy's "New Bauhaus" in Chicago, never appeared (Powers 2020). In the journal *Scrutiny*, Storm Jameson wrote an in-depth and generally appreciative review (Jameson 1939, 81–88).

During his stay in London, Gropius often gave lectures and speeches, Moholy-Nagy less often. Leslie Martin invited Moholy-Nagy to lecture at his newly founded school of architecture in Hull, but at the time Martin had only four students and the location was far from the busy capital (Carolin and Dannatt 1996, 66). In *The New Vision*, the English audience encountered a focus on design that sought to harmonize the artificial and the natural such that human life would be enhanced while a balanced environment is maintained. This would have resonated with the values and ideas promoted by contemporary English environmentalists too. Their basic premise was that old-fashioned housing reinforces the unfortunate dualism between man and nature, while modern architecture promises to reunite man and nature through healthy living. It is also worth noting that the English botanist A. G. Tansley coined the word "ecosystem" in 1935, which represented a subtle but significant shift in thinking about the interaction of individual life forms.

It was also at this time that the crossover between scientists, creative artists and humanities scholars became fashionable. Peder Anker describes Gropius' large farewell party in 1937, before leaving for Harvard in the US (also the gathering of Bauhaus émigrés and British environmentalists, hosted by evolutionary biologist and zoologist Julian Huxley) as one of the first attempts to establish an environmental architecture (Anker 2010, 9). However, while Anker identifies some interesting relationships, there is little evidence in Sibyl Moholy-Nagy's biography of her husband that he was especially excited by the question (Lewis 2019, 109).

LONDON ZOO

Nevertheless, these connections lead Moholy-Nagy to participate in a movie connected to ecological issues and to make two shorts in which his biocentric thinking is evident. For the science fiction movie, *Things to Come*, based on H. G. Wells' vision of the future of architecture and the ecological possibilities for survival of the human race, Moholy-Nagy created some special effects, which were finally left out of the movie. Wells's chief source of inspiration regarding ecology was Julian Huxley, who was the director of London Zoo at that time. Huxley was also

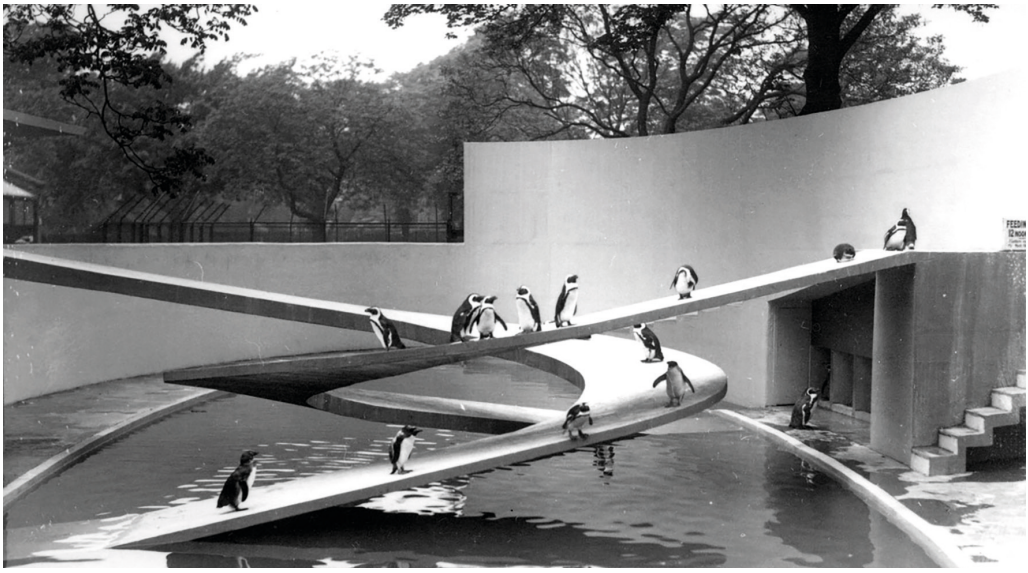

FIGURE 4. *Lubetkin's Penguin Pool. Postcard (cropped), author's archive. Original photograph F. W. Bond.*

instrumental in bringing Berthold Lubetkin to design the new London Zoo buildings. Huxley and his colleagues used constructivist design to promote the idea behind Darwin's thesis, the evolution of the human species from the animal kingdom. The new zoo design was seen as an evolution from the animal house to the Bauhaus, offering health, well-being and peaceful relationships within humans and the natural worlds. Chalmers Mitchell, who served as secretary of the London Zoological Society from 1903 to 1935, saw evolutionary biology as a cooperative model of social behavior in which peaceful coexistence was the best survival strategy in both the human and animal worlds. He believed that all species could thrive and prosper in a peaceful and healthy environment. He argued that penguins are "the most unlikely animals seem to thrive under what would seem the most unnatural conditions," provided that they had "freedom from enemies, regular food and general hygiene." (Mitchell 1936, 362) The press also echoed this idea. *The Times* wrote of the penguin pool that "architectural unity and pleasing effect, and at the same time be thoroughly hygienic, give the birds what they require, and afford ample space for visitors." (Anon 1934, 7.) (Fig. 4)

The precursor to the evolutionary model was the mechanistic view of nature popularized by Haldane and Huxley in their book *Animal Biology*. (Haldane and Huxley 1927) Huxley saw the success of human society in a new, mechanistic and mathematical approach to biology, an orderly, mathematically inspired master plan that coincided with the architectural patterns of the Bauhaus. The geometric order of the zoo buildings is a visual representation of this turnaround: the mathematical approach to biology. The new Bauhaus dwellings thus reflected this new understanding of the order of nature (Huxley 1933, 85–86). The London Zoo has become a showroom for modernist design. It was also

meant to demonstrate that this type of architecture could provide more healthy homes with better air and more light for the English poor (Hurt 1939, 32). While still a place of pilgrimage for admirers of modernist architecture, the ensemble of buildings has been frequently and rightly criticized for showcasing modernist architecture to the masses rather than providing a healthy environment for animals and for not being particularly concerned with harmony between humans and animals (Anker 2010, 18–29).

In 1936, Moholy-Nagy was commissioned by the Museum of Modern Art in New York to make a documentary about this utopian piece of avant-garde architecture. Critical reception of the film *The New Architecture of the London Zoo* was tepid. As Botar declared, it is "cinematically among his least interesting" works. "Despite the experimental nature of the buildings, the film is rather anaemic." (Botar 2008, 462) Lubetkin also was clearly unsatisfied with Moholy-Nagy's work, having expected a much more epic documentation given his oeuvre's revolutionary potential. Even in 1971 Lubetkin still remembered it disparagingly: "I protested against such a naturalistic approach." (Senter 1975, 103). Although Moholy-Nagy used mostly pure, geometric shapes in artistic practice up to that point, because he believed they were the basic building blocks of nature, in this movie he turned to much more organic visual language. Lubetkin also reflected on this philosophical tension between his geometric or mechanistic biology, on which his design was based, and on the vitalism of Moholy-Nagy's film. However, some moments, such as the abstract camera movement and the dutch tilt which reveal the double helix of the famous Penguin Pond and display the possibility of an alliance between modernist architecture and modernist film-making practices. Lubetkin's strategy for presenting the animals was derived from theatre, or more precisely, the Russian circus heritage. In defense of his geometric approach he argued that "there are two possible methods of approach to the problem of zoo design; the first, which may be called the 'naturalistic' method, is typified in the Hamburg and Paris zoos, where an attempt is made, as far as possible, to reproduce the natural habitat of each animal; the second approach, which for want of a better word, we may call the 'geometric,' consists of designing architectural settings for the animals in such a way as to present them dramatically to the public, in an atmosphere comparable to that of a circus." (Allan 2012, 199) The strange camera angles, the abrupt cuts, shaky, handheld camera motions of Moholy-Nagy come across as an attempt to escape from the peek-a-boo stage conventions implied in Lubetkin's forms.

In this movie Moholy-Nagy shows the Zoo and its visitors from the animals' perspective too: looking sharply down from a roof at the human spectators, followed by a quick counter-shot looking at an African penguin high up on the canapé. The shifts between human and animal gaze express different biological experiences of space. Moholy-Nagy's narrative—that human vision evolves into something much greater

through photographic technology—is disrupted by the captive zoo animals' way of seeing (Hornsey, 2016). It destabilizes the hierarchy of species, encouraging us to step out of the anthropocentric norm. Before this film, Moholy-Nagy had frequently used perspectives other than the typical human one, achieved through the use of non-human eye level camera views, the "bird's-eye" or the "worm's-eye" perspective to show an object from above and below. Although, in 1936, he realized that this way of showing has the risk of becoming a mere stylistic play (Moholy-Nagy 1936, 18), barely a year later, a brand new metaphor: the "camera unleashed" gave new impetus to his quest for perceptual evolution (Moholy-Nagy 1937a, 25–28). The camera/eye is set free like a beast previously on a leash. This unpredictability and freedom of Moholy-Nagy's camera movement through this fifteen-minute, silent movie destabilizes the spectacular statement of Lubetkin's architectural framework, but fits well in Moholy-Nagy's worldview in which humans share space with nature. As he expresses this view through the posthumously published *Vision in Motion* which is "an attempt to add to the politico-social a biological 'bill of rights' for people to live in harmony with nature" (Moholy-Nagy 1947, 12). This idea is practically the foundation of more recent ecological thinking, for example, the idea of a natural contract proposed by Michel Serres (1990) half a century later, or in Donna Haraway's (2007) concept of multi-species coexistence.

LOBSTERS

In the November 1935 edition of the magazine *Shelf Appeal* there is a profile of Moholy-Nagy in which the following line on his current job can be found: "If you had been at Littlehampton towards the end of this summer, you might have seen one of the town's famous lobster boats setting out with an extra cargo—a man and motion-picture camera.'' (Anon 1935, 38) He worked on a movie at that time that was released in 1936 under the title *In the Cradle of the Deep*, later called *Lobsters*. This fifteen-minute nature film was co-created with John Mathias, a wealthy amateur, through his company Bury Films. He co-produced it with Moholy-Nagy's fellow Hungarian émigré Alexander Korda who also produced of the abovementioned *Things to Come*. *Lobster* is about the life cycle of the crustacean from baby to old age and beyond to the table of a seafood restaurant, and the Littlehampton fisherman's struggle to find them. The film style is analogous to The Private *Life of the Gannets*, a nature documentary made for London Films by Julian Huxley in 1934. Although its mood is closer to the French surrealist filmmaker Jean Painlevé's *Les Oursins* (1929). The result is an odd mix of the styles of Painlevé's nature study and the General Post Office Film Unit industry celebration.

Moholy-Nagy spent several weeks getting to know the fishermen and their families, who had a long history of fishing for lobsters. He filmed their work both at the harbor and out at sea which may have

been a struggle for Moholy-Nagy who was prone to seasickness. The final film features members of the Burtenshaw and Kemp families, who fished the waters off Littlehampton, West Sussex since the 1700s. A member of the Burtenshaw family, Peter, who appeared as a tiny boy in the movie, is still alive. He remembers the everyday struggle of the fishermen: "There was no typical day, because every day was different. Sometimes you got caught out and you had to run for shelter [...] generally it was hard" (Benette 2010). Moholy-Nagy uses an artificial storm, created with the help of film effects, to show how they are at the mercy of nature, never able to count on a good catch. Burtenshaw also mentions the importance of local communities: "I think it has made me realise how important local industry is. Everyday tasks become mundane until [this industry is] not there anymore." (Benette 2010) The introduction shows Moholy-Nagy's interest in local craft processes, he describes the fishermen's work in detail, how they make lobster pots from willow twigs and how they bait. The previously mentioned worm's-eye view, however, seems to place the viewer in a trap, giving him/her the opportunity to empathize with the lobster, who looks up at the fishermen through the cord. During the rest of the movie, Moholy-Nagy switches back and forth between the human and animal perspectives.

After the introduction, the film takes the form of a classic nature documentary of the time. We observe the lobster through a scientific lens. The film shows incredible underwater footage of lobsters in their "natural" habitat, filmed at Marine Biology Station at Port Erin on the Isle of Man (Powers 2020). *Lobsters* includes novel footage of a lobster casting its shell. Beside its relevance in terms of pioneering scientific observation, the film thus showed designers and architects how they could learn about form and function by observing animals like lobsters. A year later, Moholy-Nagy mentions the horseshoe crab, the lobster's marine neighbor, as a possible biofunctional inspiration in an article in American Architect and Architecture: a "prehistoric animal shell is constructed in such a wonderful way that we could immediately adapt it to a fine bakelite or other molded plastic form" (Moholy-Nagy 1937, 23). Moholy-Nagy's idea of using nature's forms in design in this way is one possible method of a current biodesign toolkit. His observation foreshadows the methodology of biomimicry[5], the translation of solutions developed in nature into design practice, which became a discipline in its own right in the decades since.

In addition to presenting the fishermen as the protagonists of the narrative, allowing the viewer to be part of their lives, and rooting for them to land safely, Moholy-Nagy often portrayed the lobsters as personified and shaped, anthropomorphized characters to make them more endearing to evoke sympathy and identification. Ultimately, he ends the film with the victory of the lobster. In the final frames, the lobster physically tears through the back of the restaurant menu, managing to escape and get away (Schouela 2019, 156–68). Yet, in his final view, lobsters are characters, or as we say nowadays, non-human

[5] *In medical jargon biomimicry is bionics. The term bionics was first used by an American physician, Dr Jack E. Steele, in 1958. The term biomimicry appeared in 1982 and it was popularized by the scientist and author Janine Benyus in her 1997 book* Biomimicry: Innovation Inspired by Nature. *(1997) It means "a new discipline that studies models of nature and then imitates (or uses as a starting point) their structure and processes in solving human problems". Benyus' basic principle was that it is therefore worth learning from nature, because by exploiting its structural and functional regularities, human goals can be achieved with the least possible energy, and industry can become sustainable. The practical application of the principles of biomimicry goes back further: the Chinese used it 3000 years ago when they tried to produce artificial silk, and Leonardo used it to design flying structures by modelling the flight of birds, to name but a few examples.*

persons, as well as goods that help local communities survive. Focusing on localism and local economies is the basic idea of sustainability, according to contemporary ecologists. Treating animals and other non-human persons like this is a flagship concept of Anthropocene criticism or rather of a "Chthulucene" world view which draws attention to the need to achieve inter-species equity and multispecies ecojustice (Haraway 2015, 159–160). So, *Lobsters* can be also seen as an old school, post-Anthropocene movie.

CONCLUSION

Through his journey from Weimar to the United States Moholy-Nagy was one of the clearest advocates of biocentrism and the vitalist worldview. He stressed the importance of understanding "nature as a constructional model" (Moholy-Nagy 1930, 29) as a new kind of functionality. He developed his social responsibility program accordingly, with the aim of providing communities with informed planning that supports human and non-human biological needs. "The thesis on which the Bauhaus was built," he argued in the introduction to the first of series of monograph published by the Institute of Design, Chicago "is that art and architecture which fail to serve for the betterment of our environment are socially destructive by aggravating instead of healing the ills of an inequitable social system." (Gropius 1945). His pedagogic program is based on Francé's conception of *Bios* which relies on instinctive behavior, a pedagogy of maximum usage of our biological sensory capacities and their expansion. In his paper "Education and the Bauhaus", he presented the problem of the "whole man" in the context of the limits of technology:

> *Man, who if he but works from his biological center, when faced with all the material things of life, can again take his position with instinctive sureness, who does not allow himself to be intimidated by industry, the rush-tempo, external influences of an often misunderstood "machine-culture."* (Moholy-Nagy 1938a, 26)

He proposed instead a bio-technical utopia, an "ideal plane, where biological and technical functions meet", and he imagined a more balanced humanity living in harmony with its environment, rather than with technology occupying center stage (Moholy-Nagy [1927] 1969, 18). Learning from nature was thus at the heart of the Bauhaus program and the New Bauhaus program, which aimed to meet human biological and psychological needs by combining art, science, and technology. This is clearly in line with the objectives of contemporary ecological design and can arguably be seen as its precursor.

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