

# **The Abstract Organism: Towards A Prehistory for A-life Art**

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An examination of historical precedents for contemporary art practice using artificial life, in particular in the work of Paul Klee and Kasimir Malevich. Similarities are identified between artificial life and the philosophical tradition of organicism; specific examples from Klee and Malevich indicate that those artists were engaged in a form of creative organicist thought which imagined the realisation of living structures in artificial media.

Over the past decade artificial life has attracted the interest of a significant number of new media artists. The work of artists such as Jon McCormack, Troy Innocent, Karl Sims, William Latham, Simon Penny, Jane Prophet and Christa Sommerer and Laurent Mignonneau is relatively well-known within the field. Artificial life was chosen as the theme for the 1993 Ars Electronica festival; more recently, a juried competition for a-life art — “Life 2.0” — attracted a wide field of international artists. Just as a-life science has entered the consciousness of cyberculture in general, in part through the accounts of popular writers such as Stephen Levy and Kevin Kelly, it has become part of the conceptual and technical landscape of new media art.

Of course a-life ideas have been taken up in a wide variety of ways and with diverse creative intentions. Sims, Latham, Steven Rooke and Jon McCormack all use artificial evolutionary processes, but for different aesthetic and conceptual purposes. Simon Penny and other roboticists such as Ken Rinaldo and Bill Vorn and Louis-Philippe Demers use similar bottom-up techniques, but once again their artistic agendas, and resultant aesthetics, are diverse. A-life techniques are applied in a wide range of media forms — virtual worlds, generative systems, still images and animations, online environments and robotic installations. Asserting “a-life art” as a category or a genre may seem suspect, then, in that it overlooks that diversity; however here it is intended as a very simple, very general indicator of the particular conjunction that all these works share — between a-life science and art practice.

This conjunction seems an unlikely starting-point for an historical analysis. Artificial life was founded in 1987, with a Los Alamos symposium organised by Christopher Langton; it is a young field, and like other fields reliant on contemporary technology it looks more to the future than to the past. A-life art, like new media art in general, shares these characteristics — its focus is generally on the technologically-charged present and its rapidly unfolding future. The result is a kind of illusory historical vacuum which isolates contemporary practice from a wider context and places limits on its critical analysis. This paper is an attempt to indicate the presence of a historical context for a-life art. However it does not plot a linear, progressive history or an ancestry; instead, it suggests a “prehistory” — a handful of moments which anticipate the interests of a-life art and destabilise any sense that it is a strictly contemporary practice. Rather than weave a-life art into a set of pre-existing historical traditions, this prehistory is intended to provoke an altered interpretation of current work, and a sense of its possible relationships with other lines of creative thought and practice.

### **Towards a Prehistory: Organicism**

The first stage in sketching this prehistory involves considering the distinctive approach of Langton’s newly-minted science. Influenced by evolutionary theory, molecular biology and theories of complex systems, a-life sees in the natural world a set of dynamic material processes spanning all forms of living matter. It is these processes which it regards as the stuff of life. There is no ineffable vital essence: life is, as Langton says, “a property of the *organisation* of matter.” [1] This tenet enables a-life to do its central work, which is to analyse and formalise this material organisation and the processes it involves, and reproduce that organisation in an artificial medium — most often a computational medium. If living things are nothing but matter organised just so, if they are as Langton suggests “*nothing more than complex biochemical machines*”, and if it is their dynamic organisation that gives them the distinctive qualities of living things, then a structure inside a computer with the same dynamic organisation is truly artificial life.

A-life, then, is fundamentally concerned with understanding and formalising the underlying dynamic structures of living things. A-life art, defined in the simple sense outlined above, engages with the same ideas: it is a form of art practice which begins to take on, in various ways, the abstract dynamics of nature. It is here, at this more general level, that a broad prehistory begins to unfold: within the history of notions of art’s relationship with nature, there is a prominent tradition which regards nature, and specifically the manifestation of nature’s underlying form or structure, as central to art. Formal analogies between art and nature are traceable to Plato and Aristotle, who use the living body (quite casually) as a model of organisation and coherence in discussions of rhetoric and drama. (See for example Osborne [2]) Around the turn of the nineteenth century poet, critic and amateur botanist Wolfgang Johann von Goethe develops the same ideas. He commends artists to study nature, not in order to imitate its appearance, but to gain an understanding of its structure: he holds

up the example of the naturalist, who “imitates objects by recognising and emphasising the important and significant parts from which the character of the whole derives.” [3] The greatest art “is based on the profoundest knowledge, on the essence of things... .” [4] The artist should aspire to “...not only something light and superficially effective, but, as the rival of nature, something spiritually organic... to a content and a form by which it appears both natural and beyond nature.” [5] Goethe’s contemporary August Wilhelm von Schlegel is even more direct, writing in Ritterbush [6] that art “must form living works, which are first set in motion, not by an outside mechanism, like a pendulum, but by an indwelling power...”

At this general level, analogies between organic structures and works of art are widespread throughout the arts: appear in literary criticism (Coleridge), musical analysis (Schenker) and architecture (Lloyd Wright and Häring). However a-life art involves far more than a vague organic metaphor: it involves a detailed engagement with particular processes and structures, and their translation into technological media — into structures of code and engineering, into explicit and formal rules and processes. The clearest predecessors for a-life art practice, then, would combine this adoption of natural form with a tendency towards rigour and systematisation — where life emerges from the interactions of formal elements in a medium deliberately abstracted from nature. Examples of such an approach appear, oddly enough, in the work of two prominent painters of the European avant-garde: Paul Klee and Kasimir Malevich.

## **Paul Klee**

More than a hundred years after Goethe and Schlegel, European painting was still grappling with the shift away from realism and towards abstraction; Paul Klee, by now a lecturer at the Bauhaus, was articulating a wide-ranging theory of composition which in part addressed this shift. Klee was influenced heavily by Goethe’s romantic natural philosophy , but was also inspired by the physical sciences. His lectures and essays from this period adopt the language, scope and systematic style of scientific thought — enquiring into the general mechanics and dynamics of art and the picture plane — but also manifest the artist’s fascination with a natural creative energy.

Klee’s natural philosophy is best articulated in his 1923 essay “Ways of Nature Study”. Like Goethe, he advocates an intimate relationship between the artist and nature: “For the artist, dialogue with nature remains a *conditio sine qua non*. The artist is a man, himself nature and a part of nature in natural space.” [7] Klee describes the traditional artistic approach to the study of nature as “a painfully precise investigation of appearance.” “In this way excellent pictures were obtained of the object’s surface filtered by the air; the art of optical sight was developed, while the art of contemplating unoptical impressions and representations and making them visible was neglected.” These “unoptical impressions” are cultivated through close study and an intuitive perception that “can transform outward impression into functional penetration...” — an understanding of function and process, as well as structure:

“Anatomy becomes physiology.” At the culmination of this process of nature study the artist attains a new vision, and a new creative capacity.

His growth in the vision and contemplation of nature enables him to rise towards a metaphysical view of the world and to form free abstract structures which surpass schematic intention and achieve a new naturalness, the naturalness of the work. Then he creates a work, or participates in the creation of works, that are the image of God’s work.

One lecture from 1923 illustrates the way Klee pursues this natural ideal through close formal analysis; headed “Primary forces of form production, form-creating and form-articulating nature”, it is a lesson based on the forms and dynamics of the leaf and the tree. Klee begins with a sketch of the articulated unity of the tree: “[a] leaf is part of the whole ... an organ” — these organs are “again articulated in themselves.” [8] Klee notices the tree’s fractal quality, its self-similarity across scale: “articulate ideas and relations prevail that reflect on a small scale the articulation of the whole.” The leaf itself is analysed in terms of a motivated branching line, emerging from the leaf stem: “[n]ote that the line is charged with force especially at the point where it must produce as many branchings as possible, namely at the beginning, close to the stem.” The form of the leaf emerges as this force is exhausted; the branches of the central vein become smaller towards the leaf tip; “[t]he intervals and dynamic forces dwindle to the point of no return.”

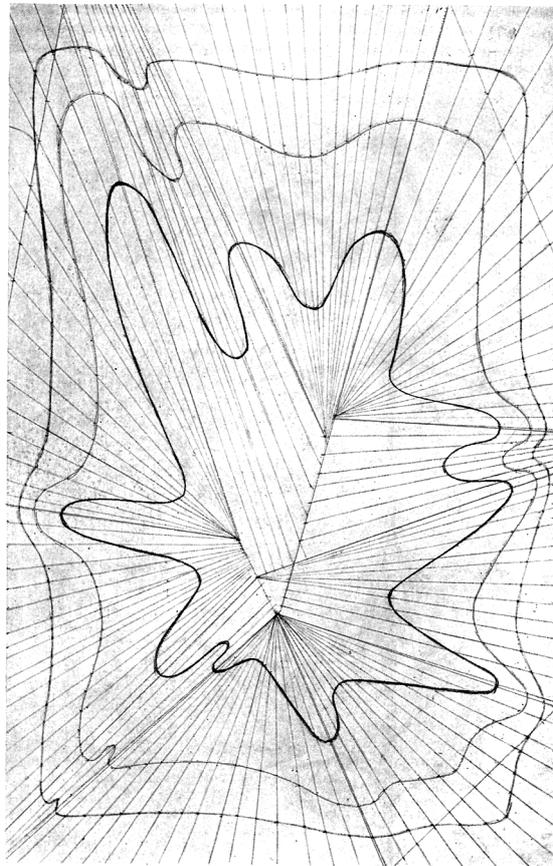


Figure 1. Paul Klee, “Figuration example for an exercise set on Tuesday, 30 October 1923.” From Klee [8], p.22. ©

Paul Klee,1923/Bild-Kunst. Permission of VISCOPY Ltd,Sydney 2000.

Klee set a graphic exercise after this lesson which clearly illustrates the final, synthetic or creative stage of this pedagogical process: it was entitled “Imaginary leaves on the basis of the foregoing insight into basic rules.” Klee describes his own example of a solution to this exercise as a “free geometric-aesthetic effort”; an artificial leaf with ruled veins extending in all directions, and wavy, amoeboid lines indicating several possible contours for the leaf’s edge (Figure 1). It is a very clear demonstration of the way an analytic understanding of natural processes and structures informs the “free abstract structures” of Klee’s work — and note here that this artificial leaf diverges from its natural model: it has no stem — it has separated itself graphically and metaphorically from the larger plant, forming an abstract, self-contained structure. Klee’s visual analysis of the leaf involves a translation of its morphogenetic forces into a two-dimensional diagram: it comes to be understood in an artificial universe which consists of lines, planes and tones. Elsewhere in Klee’s work it is clear that he imagines the picture plane as a kind of contained, artificial world. Throughout his Bauhaus lectures on form and composition, Klee can be seen to be exploring a kind of artificial physics for the picture plane — or more, an artificial cosmogeny. “Abstract formal elements are put together like numbers and letters to make concrete beings or abstract things; in the end a formal cosmos is achieved...”. [9] There is a strong sense that the artificial world of the artwork embodies not only metaphysical natural laws, but more basic, formal *rules*: “The work grows in its own way, on the basis of common, universal rules...”. [10] Finally, the realisation of these rules in the picture plane gives rise to a form with its own “face”, “physiognomy” and “posture” — if the form seems organic but somehow unearthly, Klee explains, “Entirely different forms may well have arisen on other stars.” [11] Here the artist is travelling “the paths of natural creation”, paths that for Klee lead, as Christopher Langton puts it, not only to life-as-we-know-it, but to life-as-it-could-be.

## **Kasimir Malevich**

In Russia, Klee’s contemporaries in the avant-garde were infused with utopian zeal: after the 1917 revolution, art became involved in a wave of social transformation. The Constructivists, perhaps the movement most strongly identified with this period, looked to industrial production and the machine as agents of change. Suprematism, the movement declared by Kasimir Malevich around 1913, was founded on a rhetoric that was equally utopian, but far more esoteric. Writing in 1919, Malevich describes Suprematism as a “hard, cold system, unsmilingly set in motion by philosophical thought.” [12] It aspired to the creation of a new, “non-objective” reality based on the dynamic interrelations of pure forms — figures presented in Suprematist painting with a strict, utilitarian economy. Malevich pursued the reduction of form to its logical conclusion, showing a canvas in 1915 consisting of a single black square on a white ground — a Suprematist icon, a reduction, as fellow Suprematist El Lissitzky writes in 1922, of all painting to “zero”. [13] Suprematism is most commonly identified with this extreme abstraction, a pursuit of painting’s absolute endpoint. However in the writings of Malevich and Lissitzky this “hard, cold system” is interwoven

closely with ideas of organic form; the organism appears as a metaphorical figure, but also, remarkably, as another absolute endpoint for art: the creation of a structure so perfectly refined that it attains living autonomy.

Suprematist a-life emerges, rhetorically, just as it does in Klee: a process of abstraction or analysis gives rise to a notion of the underlying form or dynamic of life, and this dynamic is then applied in an artificial medium. Like Klee, Malevich takes outward form as an indication of an underlying dynamic, and once again he anticipates the incorporation of these natural dynamics into Suprematist art. In “On New Systems in Art” (1919) he argues that the artist, observing a natural landscape, sees not a pictorial scene but “painterly masses in motion and in rest... the composition of nature, the symmetry and harmony of contradictory elements ... . He stands and exults in the flow of forces and their harmony.” [14] Later he writes simply that “[f]orm clearly points to the dynamic state of a situation...”. [15] Malevich denounces realistic or imitative painting, which he labels “dead”; instead, Suprematism renders this “flow of forces”, imagining its paintings not as framed-off representations, but as objects in their own right — instances of a “non-objective” reality. Instead of imitation, Malevich announces “absolute creation”, whereby this adoption of natural dynamics comes to its culmination: “*a work of pure, living art.*” [16] “Creating means living, eternally creating newer and newer forms. ... Forms must be given life and the right to individual existence.” [17] Where Malevich parts company with Klee is in imagining the ultimate implications of an art pursuing natural dynamics: the artwork is no longer a representation of nature, but a new, artificial-natural object. “The ... living picture will be a real part of the whole living world...”. [18] In “Infinity...” (1919) he writes that the “highest and purest artistic, creative structure ... does not possess a single form of the existent. It consists of elements of nature and forms an island, appearing anew.” [19]

In an extraordinary, extropian flourish, Malevich also imagines the Suprematist conquest of interplanetary space: the pure forms of painting give way to a “Suprematist machine”, a spacecraft which is propelled “not by means of engines, ... but through the smooth harnessing of form to natural processes, through some magnetic interrelations within a single form”. [20] In fact, “[E]very Suprematist body constructed will be incorporated into a natural organization and form a new satellite ...” These organic machines are destined to leave the planet: the forms of Suprematism

... have nothing in common with the technology of the earth’s surface. All technical organisms are nothing but small satellites, a whole living world ready to fly away into space and take up a particular position. Indeed, every such satellite is in fact equipped with reason and prepared to live out its own personal life.

Once again this autonomy is a result of the extremely refined nature of the forms: “Suprematist forms have achieved utilitarian perfection. They are no longer relevant to the earth, and they can be treated or studied like any planet or complete system.”

The Suprematist canvas, following this organic line, appears not so much as a pure formal essence or metaphysical icon, as an abstraction of natural dynamics; Malevich imagines a manifestation of those dynamics so perfect that the work moves off the canvas and into interplanetary space, propelled by the “natural processes” of its internal articulations. Malevich foreshadows the completion of the Suprematist pursuit of “pure creation” in the form of an autonomous “technical organism”.

## **A Prehistory?**

Klee and Malevich offer an anticipation of a-life art which is at times uncannily close: their writings develop a notion of an inner natural dynamic — one that involves a particular understanding of natural structures. They pursued, by their own accounts, a creative practice which abstracted, formalised and adopted that dynamic, applying it in an artificial (pictorial) medium, and in the case of Malevich, imagining its ultimate manifestation in living, autonomous works of art. There are also some very detailed premonitions: Malevich anticipates the manifestations of “natural processes” in a machine, a “technical organism”, traversing the opposition between the mechanical and the organic long before Kevin Kelly. Malevich’s desire to radically amplify or extend the artist’s creative capacity is evident in the contemporary use of artificial evolutionary techniques, where the user/artist navigates a vast space of aesthetic potential. (See Whitelaw [21]) The Suprematist imagination of an autonomous “technical organism” is likewise echoed in the aspirations of contemporary artists such as Yves Amu Klein [22] and Kenneth Rinaldo [23]. Also evident in contemporary work are traces of Klee’s organicism — a sense that a-life art entails a heightened understanding of nature: Australian artist Rodney Berry [24] comments that his work “fosters an interest in an aesthetic of systems and processes, rather than objects and images”, and links this aesthetic to a changed appreciation of nature, one which is ultimately expansive and ecological. Similarly, Jon McCormack [25] remarks that experience with a-life processes triggers “a wider appreciation of natural systems...”.

In as much as these correspondences simply indicate the presence of an uncharted prehistory for a-life art, they are valuable in themselves. They destabilise conventional assumptions about the very contemporary, techno-centric nature of a-life art by suggesting an alternative approach — a proto-a-life based in oil painting and philosophical speculation. Similarly, simply playing art-historical “snap” here is less useful than considering the ways in which this history seems anachronistic even as it feels familiar. The thinking of Klee and Malevich reminds us of a-life, but predates it by over sixty years — and in comparing it with contemporary a-life art, one element is obviously misplaced. By definition, contemporary a-life art involves applications of a-life science — it borrows and implements a-life’s repertoire of computational techniques and formal templates. However for Klee and Malevich, there was no such relationship: as Henry [26] and Douglas [27] show, they borrowed conceptual elements from the science and philosophy of their time — Romantic vitalism, evolutionary

theory and physics — but had no single, pre-existing body of thought and technique to draw on. Their “proto-a-life” is itself a kind of synthetic mixture, one which incorporates these scientific and philosophical influences but is fundamentally an approach to art and art-making. For both Klee and Malevich, the notion of a creative process somehow inherent in the formal structures of nature is central, and they imagine art’s appropriation of that process as an ultimate point in its progression. For Klee, that point is mystical or metaphysical — an approach to the divine; for Malevich, it signifies “absolute creation”, endless generative novelty, a transformed reality. Thus both artists can be seen to provide not only a premonition of a-life art, but more basically, a premonition of artificial life as an activity fundamentally concerned with creation and creativity. This is a prehistory of a-life as an artistic practice — one which in fact projects artificial life as a kind of ultimate achievement for modern art.

To what extent, then, can contemporary work be understood as a continuation of this formal organicism? To what extent does it share the goals articulated by Klee and Malevich, their aspirations to “absolute creation” or a mystical affinity with nature? In the thinking of Klee and Malevich there are certain stable categories which, in a postmodern present, we may imagine are no longer viable: notions of art and the artist as involved in seeking some metaphysical natural truth, or some pure or absolute creative state. Contemporary artists often use a-life knowingly, even playfully, and largely in the absence of such an overt metaphysical drive. The rhetoric of an organic ideal is set aside in favour of a more reflective approach: the work raises questions about the status of nature and its simulation, the concept of autonomous agency, our relationship with technology. However that organic thinking somehow persists — for all the reflexive framing, a basic creative interest in the generative capacity of natural structures remains. Contemporary thought tends to avoid the visionary style of artists such as Klee and Malevich, but it seems that elements of their thinking, and of a broader organicist tradition, are unwittingly reworked by contemporary artists using artificial life.

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