

Katja Blomberg Nature Speaks the Language of Mathematics

“[The universe] cannot be read until we have learnt the language and become familiar with the characters in which it is written. It is written in mathematical language, and the letters are triangles, circles and other geometrical figures, without which means it is humanly impossible to comprehend a single word.”

Galileo Galilei, 1564–1642¹

Galileo Galilei’s insights from the early seventeenth century appear to be formative for the steel sculptor and engineer Hans Uhlmann (1900–1975) and the British sculptor and technical draftsman Lynn Chadwick (1914–2003) as well as the philosopher and sculptor Katja Strunz (*1970). All three artists and their works have deep roots in the European history of scientific research. The polymath Galileo did not only propose a new model of planetary orbits and speed of falling bodies but was the first to describe the surface of the moon with its craters and canyons and think about the energies affecting every object on Earth. Defying gravity, recognising mathematical structures in nature and observing its character represent commonalities of Galileo’s works with those of Lynn Chadwick, Hans Uhlmann and Katja Strunz in the twentieth and twenty-first centuries.

Hans Uhlmann, the first steel sculptor in Germany

Hans Uhlmann was born in Berlin in the year 1900. After the end of World War I he completed a course at Technische Universität Berlin, which focused on mathematical and technical problems of construction. At the same time he was able to visit exhibitions of the international avant-garde in Berlin, particularly those of the Russian Constructivists Naum Gabo and Antoine Pevsner, who wrote the ‘Realistic Manifesto’, the benchmark for a radically new approach to sculpture in the 1920s. Uhlmann took the objectives formulated in the manifesto at face value, almost to the letter: ‘The plumb line in hand, the look accurate as a ruler, the mind rigid as a compass, we are building our works as the universe builds. [...] We disown volume as a plastic form of space. [...] We disown, in sculpture, mass as a sculptural element. [...] We proclaim a new element in plastic arts: the kinetic rhythms, which are essential forms of our perception of real time ...’²

Towards the end of the 1920s, while lecturing full-time on electromechanics at Technische Universität Berlin, Uhlmann took his first steps as an artist. It is highly likely that he was familiar with both, the ‘Realistic Manifesto’ and the scientific research of earlier generations.

His first solo exhibition of cage-like, soldered wire sticks took place at Galerie Gurlitt in 1930. Shortly after the Nazis seized power, the communist sympathiser Uhlmann lost his lectureship. Leafleting in the autumn of 1933, he was arrested by the Gestapo and incarcerated for alleged treason at Berlin-Tegel prison. Later he worked at

National Krupp in Neukölln on the development of a calculating machine, while drawing and sculpting in hiding without the slightest prospect of exhibiting his works.

If we compare the exhibited works by Chadwick with those of Katja Strunz and Hans Uhlmann, we venture into an experiment, which relies on the viewer’s readiness to engage sensitively with their commonalities and parallels as well as their differences. At Haus am Waldsee corporeal, nervous bronze formations by Chadwick meet airy wire figures and constructions of geometrical metal cuts by Hans Uhlmann as well as folded metal and steles by our contemporary Katja Strunz.

Inside and outside – a dialogue between Uhlmann and Chadwick

At the outset, there is a filigree ‘beast’ by Chadwick from 1953 (fig. 1). On three spindly legs it cranes itself into the vertical direction. Like a grasshopper it seems poised to jump into the air. Opposite this ‘beast’ stands an ‘avian creature’ by Uhlmann from 1952, which was drawn into space with a virtuoso certainty using bendable steel pipes. The silhouetted shape unfurls from a recurring curvature. As with Chadwick the legs touch the ground only pointedly. Overcoming gravitation seems within reach. The ‘avian creature’ (fig. 2) proudly faces the world, calmly surveying its surroundings, whereas Chadwick’s ‘beast’ radiates a vibrant dynamism.

This initial juxtaposition already demonstrates structural similarities but also differences in building and handling sculptural volumes. Chadwick’s ‘beast’ allows us to track the internal makeup of its supporting frame on the bronze surface of a cubically abstracted body. In between the supporting frame there are planes and folds that are furnished, like the surface of the moon, with rough and uneven chasms and craters.

Looking at this sculpture we can imagine hearing the high-strung tension with which this creature senses and scents the imminent moment. By contrast, Uhlmann’s transparent ‘avian creature’ traces merely a notional volume. He outlines a figurative, recurring fluidity of motion. Towards the end of the 1940s Will Grohmann observes: ‘While all the sculptors, who have used wire as their material, have created non-figurative works [...] Uhlmann connects these peripheral means [...] with figurative representations. The results are birds and other animals, figures, scenes of dancing and acrobatics, metamorphoses.’³

The animal motif of a winged creature plays a central role particularly in the early works of Chadwick as a traditional symbol of freedom of thought and creativity. It appears remarkable, however, that the difference in sculptural habitus remains characteristic of both oeuvres until the very end: Chadwick electrifies with a thin-skinned, wrinkled surface structured by triangles, whereas Uhlmann achieves a harmonic balance that shows no signs of age but displays energies, which are transformed into auratic silhouettes in the early works and later into mathematically constructed interlacings.

Two sculptor-engineers on the path to success

In view of their biographical background, both artists have the experience of a mathematical, scientific education in common. Chadwick worked as a technical draftsman in various architectural

offices until 1939. Having retrained as a pilot he flew missions for the Royal Navy until 1944. After the war he continued to design textiles and take jobs at architectural firms until 1952. Chadwick only began to make sculptures in the late 1940s, creating delicate mobiles from wire, which were sold by the London gallery Gimpel Fils in 1950. Both artists were self-taught. Before the war they followed the developments in art in London and Berlin, respectively, but also in Paris, at the highest stage. Therefore they did not get to work naively with regard to technique and content when they almost simultaneously gave up their day jobs and embarked on their careers as sculptor-engineers in the late 1940s. By 1953 at the latest, Uhlmann and Chadwick had ample opportunity to notice, or even meet each other on the stage of international art. At the very beginning of their careers, both artists took part in the first international sculpture competition after the war, the 1952 competition ‘Monument to the Unknown Political Prisoner’ (fig. 3) commissioned by the Institute of Contemporary Art (ICA) in London. In March 1952, the British diplomat and art critic John Anthony Thwaites, who had worked in Germany since 1946 and supported both British and German post-war art, had explicitly called on Uhlmann to take part in the competition. More than 3,500 sculptors from all over Europe answered the call for entries. For the pre-selection of the German-speaking countries, 262 entries were shown at the Berlin Haus am Waldsee, including the winning design by Hans Uhlmann. Among the final selection of around 140 works exhibited at the Tate Gallery in London was the entry by Lynn Chadwick, which received one of the prizes there.

Additionally, the artists are likely to have met after 1952 at the Venice Biennales, ‘documenta’ (1955), ‘Il. documenta’ (1959) and ‘documenta III’ (1964) in Kassel, where they both had works on display, as well as at ‘documenta 6’ in 1977, in which Uhlmann participated. To the surprise of most observers, Chadwick won the International Prize for Sculpture at the 28th Venice Biennale in 1956. Overnight, that success turned him into a recognised star of the international art world.

Exhibiting together for the first time

Only a few years later, in 1960, a double exhibition with works by Chadwick and his British artist friend Kenneth Armitage toured through Germany. The show stopped at Städtisches Kunstmuseum in Duisburg (today called Wilhelm Lehmbruck Museum) and at Haus am Waldsee. Werner Schmalenbach, at the time director of the Kestner Gesellschaft in Hanover and curator of the exhibition, examines Chadwick’s oeuvre – then still in its early stages – in the accompanying catalogue. In particular, he highlights his architectural composition: ‘In their field Chadwick’s sculptures are what is called a skeleton structure in architecture: a frame construction with padding.’⁴ While Schmalenbach does not consider Chadwick a ‘tectonic’ sculptor, he nevertheless attributes constructive properties to the production process of the works because – as we saw above – the substructure made of steel bars remains visible on the surface. In many instances the artist works with devolution into triangular figures. ‘Moreover, architecture’, Schmalenbach continues, ‘is in our time not only of “tectonic” character. In reinforced concrete, people venture all kinds of dynamic construction.’⁵ Here lies an obvious connection to Uhlmann’s works, which emerge directly from the dynamic of line and form.

The Dresden-based art historian Will Grohmann stresses in 1954: ‘Since Uhlmann considers art to be something absolute – while nature is, for him, not raw material but laws – he is on his own und sets out with more malleable materials like a modern architect would use that assist him in realising the absolute.’⁶ Chadwick transfers architecture visibly to the inside of his sculpture, whereas Uhlmann explicitly addresses the static framework as such. The British artist prefers to see his works in the landscape as the independent creations they are, while Uhlmann seeks the direct relationship to urban space. Over the course of Germany’s reconstruction after the war, Uhlmann, who had been a professor at the Berlin art academy since 1950, won numerous competitions all over West Germany. In sharp contrast to Chadwick’s reproducible bronze sculptures, Uhlmann considered his architecture-related projects, which were always unique, of singular importance, as he points out in a conversation with his biographer Werner Haftmann: ‘Remembering all the various situations I was confronted with, I would have to count my commissioned works among the most important works I was able to realise [...].’⁷ Later, the art critic Camilla Blechen concludes in an article in the Frankfurter Allgemeine Zeitung that Uhlmann was not actually engaging in ‘art on the building’ but in ‘art with the building’.⁸ Working in close contact with the respective architects and a site-specific practice came naturally to Uhlmann.

Two projects, which are presented in the exhibition in the form of models, sketch Uhlmann’s journey from a free, spatial dynamism to a planar, interlaced fold of space. Simultaneity, weightlessness and the motifs of splintering and folding play a crucial role here, just like they do in the works of Chadwick and Strunz.

Two works in public space

Uhlmann’s continued interest in the latest developments of the natural sciences is clearly demonstrated by a commission he won on the occasion of the exhibition ‘Interbau 1957’ for Hansaplatz in Berlin. Uhlmann created a five-metre-tall standing figure made of chromium-nickel steel that towers on three double legs spread wide (fig. 4). In between, thin steel pipes with polished steel balls rear diagonally upwards and downwards, marking the highest point of a pendular movement. Uhlmann’s sculpture on Hansaplatz appears like a confident counterpart to the seminal ‘Atomium’ at the 1958 world fair in Brussels, a statement on the threshold of the space age and the nuclear age.

Regarding Uhlmann’s works, Will Grohmann defers to Johann Wolfgang von Goethe: ‘The work of art should be like a clock with a transparent face. It should tell the hours and reveal how that happens by displaying the entire clockwork at the same time. That is the case here. The shroud has been lifted. We see the gears and cogs and experience the sculptural devices as an act of space-time.’⁹ And not least, Uhlmann attempts to visualise geometry, dynamics and cosmic forces by sculptural means in the impressive sculpture of Hansaplatz.

A mere two years later, Uhlmann created his most prominent work (fig. 5 und 6): in front of Deutsche Oper in Berlin he installed a twenty-metre-high stele of steel with an expansive fold motif. The new opera house was designed by Fritz Bornemann with a 64 by 14 metre façade of exposed aggregate concrete. It forms an ideal background to Uhlmann’s fold motif, which sits on the vertical stele like a giant origami bird. The sculpture of nine metric tons was produced in Berlin

engineering works in 1961. Uhlmann placed it between the street and the building. The main motif is folded back onto itself and as such strictly symmetric in geometric terms. It speaks of rhythmic wing beats taking to the sky like sound.

After harsh protests against the work, the art critic of the Berlin newspaper *Der Tagesspiegel*, Heinz Ohff, invited the artist to publish a statement: ‘I have placed it [the work] in relation to what goes on inside the building, that is, in relation to music: unfolding forms that amount to a dynamic construction, the order of which might correspond to the order of the musical material. As such it contains no illustrative or allegorical elements. For that reason, the sculpture also does not have a name.’¹⁰ It is art, according to the sculptor, because it has overcome technology by means of technology. The chromium-nickel, black-tinted sculpture of 1966 for the city of Bielefeld formulated that thought in an even more pointed manner. It is additively manufactured from triangles and rhombi, opening up from its core like an artificial plant.

Propensities to folded constructions

Irrespective of their many differences, the sculptor-engineers Chadwick and Uhlmann saw eye to eye in the constructivist approach, which resulted in structures that increasingly fan out prismatically. In the final years of his life, Chadwick found clearly formulated geometric shapes in large formats. In the 1990s, he created his last series of ‘beasts’, drawing on the motifs of the older bronze sculptures. Employing the material of chromium-nickel steel, which he had rarely used before, Chadwick rejuvenated the motif. This transformation process lead to creatures with triangular, polygonally fragmented surfaces. While Uhlmann interlaced black plates of steel, Chadwick covered his creations with a closed stainless steel skin made of triangular surfaces. In direct sunlight, these creatures appear strangely artificial, as if the older works of the same motif had been stuck in armoured casings in preparation of a flight to Mars. Opposite, Uhlmann’s ‘Entfaltung’ (unfolding) stands tinted black like a construed cactus from another galaxy. Uhlmann died in 1975 at the age of seventy-five. His oeuvre hardly transcends the multi-faceted space utopia of the 1960s. Artistically, he continued the tradition of the Russian Constructivists Naum Gabo and Antoine Pevsner. Lynn Chadwick, by contrast, managed to produce, at the relatively advanced age of eighty years, a major group of works that seemingly anticipates a future aesthetic. The surfaces of his last ‘beasts’ appear to be 3D-low-poly and freely moveable in every direction. They are foldings such as those currently widely used in fashion, architecture or the medical professions.

The fabric of space and time according to Katja Strunz

Katja Strunz represents a sculptural position of the present. Strunz, too, did not begin her career as a sculptor. She studied philosophy and art history in Mainz before taking up an art degree course in Karlsruhe. Since the early 2000s, she has studied the constructivist-minimalist tendencies of her predecessors from the twentieth-century in her free time. In doing so she deconstructs traditions rather than continuing them. However, concepts such as gravity, the fabric of space-time, construction, fragmentation, shrinking or folding play a central role in her practice.

It seems remarkable that Strunz conceives of the moment of ‘time’ as a traumatised repetition and of ‘form’ as a fragmentation of a whole falling apart. It would seem more natural to expect this notion of a generation traumatised by war like that of Chadwick and Uhlmann. Yet her elder colleagues preferred to approach the basic questions of sculpture regarding time, dynamism and energy from a scientific, mathematical and architectural perspective, whereas Strunz views them from a conceptual-cognitive point of view. Her three-dimensional objects appear to be comparable to the works of Chadwick and Uhlmann at first glance. However, against the background of our digitalised present they evoke themes of transience rather than representing the beginning of a journey into a new age.

Strunz works with the moment of gravity, constituting form not in the sense of overcoming gravitation but in the sense of falling. To this end, she employs second-hand construction materials, clocks or metal to render the ageing process of existing things visible in a haptic manner. Thus she consciously removes herself from a present ruled by technology, media and virtual concerns, a tendency that also holds sway over the art world. In an interview in this catalogue, Strunz declares that she works with folding in the sense of coincidence, idea and even accident. This enables her to render time visible as decay: ‘Folding is a three-dimensional, formal structure in motion. It entails a before and after. The process of folding and unfolding can be reiterated infinitely many times, resulting in new forms at every iteration.’¹¹ In precisely this sense, her great folding work ‘Zeitraum #7’ (2004), a fragmented wall work, takes centre-stage in the exhibition.

- 1 Galileo Galilei, *Opere II Saggiatore*, p. 171.
- 2 Naum Gabo and Antoine Pevsner, *Realist Manifesto*, 1920, quoted from: <http://www.terezakis.com/realist-manifesto.html> (last accessed March 31, 2019).
- 3 Will Grohmann, ‘Druckfahne für Katalog Gerd Rosen’, 1947 / 48, quoted from: *Im Netzwerk der Moderne: Kirchner, Braque, Kandinsky, Klee, Richter, Bacon, Altenbourg und ihr Kritiker Will Grohmann* (exh. cat. Staatliche Kunstsammlungen Dresden, Kunsthalle im Lipsiusbau), edited by Konstanze Rudert, Munich 2012, p. 300.
- 4 Werner Schmalenbach in the catalogue accompanying the touring exhibition ‘Kenneth Armitage, Lynn Chadwick’, which he initiated as director of the Kestner Gesellschaft, Hanover, and which also travelled to Haus am Waldsee, Hanover 1960, p. 29.
- 5 Ibid.
- 6 Will Grohmann and Hans Uhlmann in: *arti visive 1* (1954), quoted from: *Im Netzwerk der Moderne* 2012, see note 2, p. 300.
- 7 Hans Uhlmann, in: Werner Haftmann, Hans Uhlmann, *Schriftenreihe der Akademie der Künste*, vol. 11, Berlin 1975, p. 69.
- 8 Camilla Blechen, in: *Frankfurter Allgemeine Zeitung*, November 27, 1970.
- 9 Will Grohmann in a catalogue manuscript for the gallery of Gerd Rosen, 1947 / 1948, quoted from: *Im Netzwerk der Moderne* 2012, see note 2, p. 300.
- 10 Hans Uhlmann, in: *Tagesspiegel*, October 21, 1961.
- 11 Katja Strunz in an interview with Natalie Weiland in this catalogue, p. 92.

