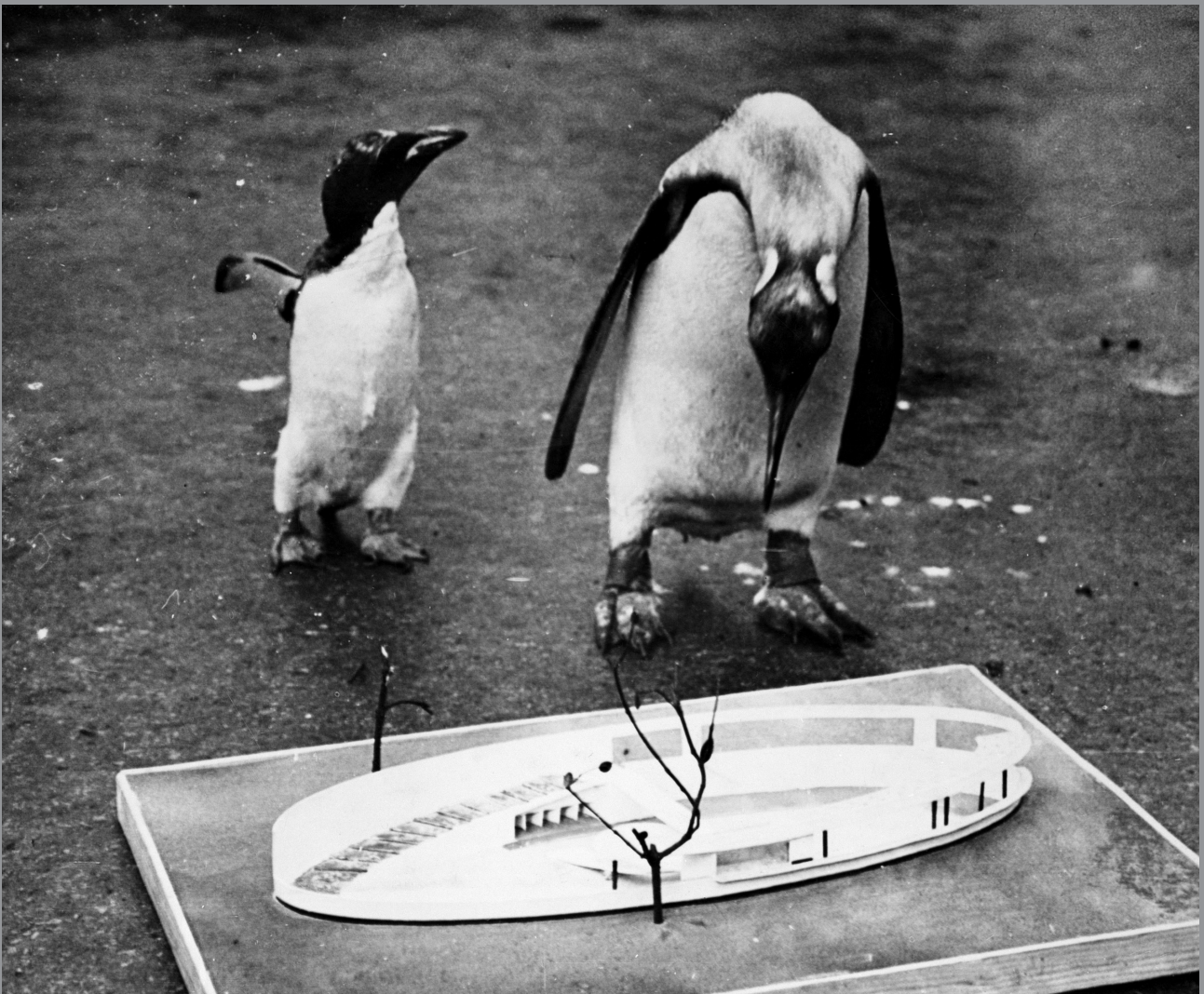


# Bridge of Dreams: The Penguin Pool, London Zoo



**THE Penguin Pool at London Zoo 1934, designed by Berthold Lubetkin & Tecton is one of the iconic landmarks of modern architecture. This article tells the story of its creation, the structural secrets of its audacious spiral ramps and its varying fortunes in the evolution of the zoo as an institution for the display of captive animals. The Penguin Pool, visited and admired by thousands over the 75 years since its completion, also stands as a poignant emblem of the dreams and disappointments of modern architecture.**

By John Allan

**T**HERE can be few visitors to London Zoo who have not gazed at the Penguin Pool—Berthold Lubetkin’s iconic *jeu d’esprit* of 1934—and dreamed of walking upon its miraculously unsupported ramps. This tiny aquatic sculpture—it could hardly be called a building—has captivated who see it, and through its worldwide publication, many who have not. Apparently so simple, yet like so much of Lubetkin’s work, the Penguin Pool is densely coded with stories, references and ultimately—dreams. But where did it come from and how does it work?

By the time of Lubetkin’s arrival in England in 1931 and the formation of his atelier Tecton the following year the early concept of the zoo as a collection of exotic curiosities for spectacle and entertainment had been superseded by ideals of public education and scientific study. This new approach with its naturalistic style of animal accommodation was promoted by the early 20<sup>th</sup> century work of German zoologist Carl Hagenbeck and could be regarded as the progressive orthodoxy with which Lubetkin’s more conceptual manner would be contrasted. While basing his solutions on no less scientific investigation, Lubetkin’s distinctive contribution was his pursuit of a more abstract or idiomatic mode of display. The series of buildings he designed for London Zoo in the 1930s coincided with one of its most vigorous periods of expansion, when the institution’s profile was at its zenith and long before the advent of television brought natural history into everyone’s living room.

Lubetkin’s association with the Zoo proved to be as pivotal as it was unlikely. Born in Tiflis, Georgia in 1901 and moving to Moscow and Petersburg where he was to experience the turmoil and excitement of the 1917 Revolution, Lubetkin was fired by the revolutionary art of the Constructivists and developed an unshakable conviction in the interdependence of social progress and radical architecture. Leaving Russia in 1921 in search of greater technical expertise he proceeded to travel Europe in a fabulous decade of auto-didactic adventures. These had

taken him to Berlin, Warsaw and finally Paris where he had studied under Auguste Perret, worked with the USSR Trades Delegation and then realised his first significant building, an apartment block of extraordinary architectural precocity for a designer not yet 30 years old.

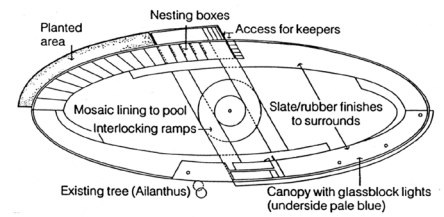
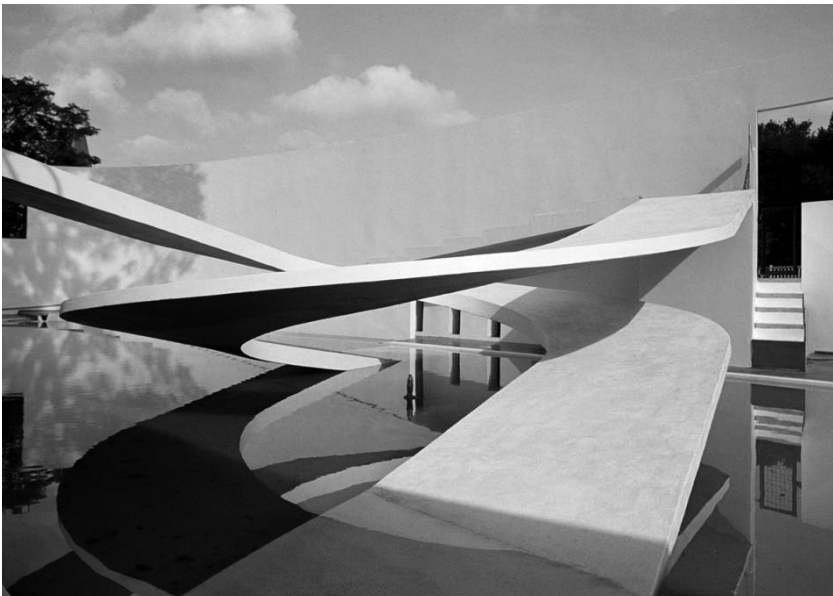
With no further prospects in Paris Lubetkin had come to London in search of work but after months of frustrated commissions was on the point of departure when his first real assignment appeared with the invitation to design a new Gorilla House for London Zoo. This was hardly the challenge of creating ‘homes for heroes’ that had first attracted him to England, but in the immediate vacuum of unemployment it was, as one of his Tecton partners later recalled, ‘simply a lifesaver’. Indeed Lubetkin would remain in England for the rest of his life, dying in Bristol in 1990—a naturalised British citizen.

With its cylindrical form and combining a rotating roof, sliding screens and revolving walls to provide a variable environment for animals and visitors in summer and winter, the Gorilla House caused a stir and even before it was completed Lubetkin had been commissioned to design what would become his most celebrated zoological project, a new exhibit for Antarctic penguins.

The Penguin Pool with its elliptical plan, coiled interlocking ramps and expressive ‘diametry’ (Lubetkin’s term for symmetry across a diagonal axis) took his geometrical preoccupations still further. The pool was conceived as a freestanding sculpture on an open site, its only contextual reference being a nearby *ailanthus altissima* which Lubetkin insisted be retained as a vestigial natural foil to his geometric abstraction. Contrary to the convention of simulating natural surroundings for captive animals, Lubetkin’s objective was not literally to recreate the avian habitat of an emperor penguin but rather to suggest a metaphor for Antarctica in a miniature cameo that both expressed the animals’ natural characteristics and also fully acknowledged, indeed celebrated, the human artifice involved. The enclosure’s perimeter is even inscribed within slotted *proscenium* screens as if to dramatize the theatrical connotation.

Forming the central vortex are the famous spiral ramps

< Nature confronts culture. Photo by Berthold Lubetkin, 1933.

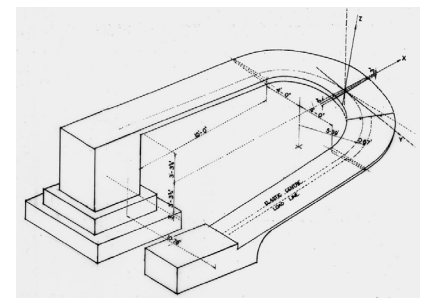


The geometrical proposition.  
Drawing by John Allan.

< Bridge of Dreams. Photo by John Allan, 1987.



< An aquatic sculpture enclosed within  
proscenium screens.  
Photo by John Havinden, 1934.



The structural reality. Drawing by John Allan.

purporting to provide the flightless birds with a purposeful promenade, whilst in fact ceremoniously leading them back to the same bank from which they embarked—an architectural conceit exaggerating their endearingly comic aspect on land in contrast to their dazzling speed and grace in water. However, nobody should imagine this playful *capriccio* was not the result of fiendish ingenuity.

Conjured in reinforced concrete of only 10 cm thickness the surrounding screen walls were a masterpiece of shuttering carpentry and geometrical precision. But the ramps are still more inventive in their exploitation of a double cantilever—their longitudinal outreach extending over 14 m in length, their cross section tapering from 15 cm across to 8 cm to optimise the impression of delicacy by

disguising their inner thickness with a thinner outer edge.

Yet there is still the mystery of how the ramps are supported. What could account for their structural capacity to carry the equivalent weight of 24 adults lining each ramp without collapsing into the water? The answer is right in front of you—artfully concealed. At the top and bottom of each ramp is a massive concrete abutment anchoring and counterbalancing the enormous leverage of the ramp itself. But each of these four enormous abutments is either buried or camouflaged. Those at the ramp feet are hidden below the water line and assimilated into the pool frame. Those at the ramp summit are disguised as something else—one forming the landing of the flight of shallow radial steps that rise around the north-west quad-

rant, the other absorbed into the volume of a keeper's store that sits below the diving tank in the centre of the southern walkway. An illustration of the structural reality, with these concealments removed, reveals just how crucial to the architectural concept is this ingenious deception.

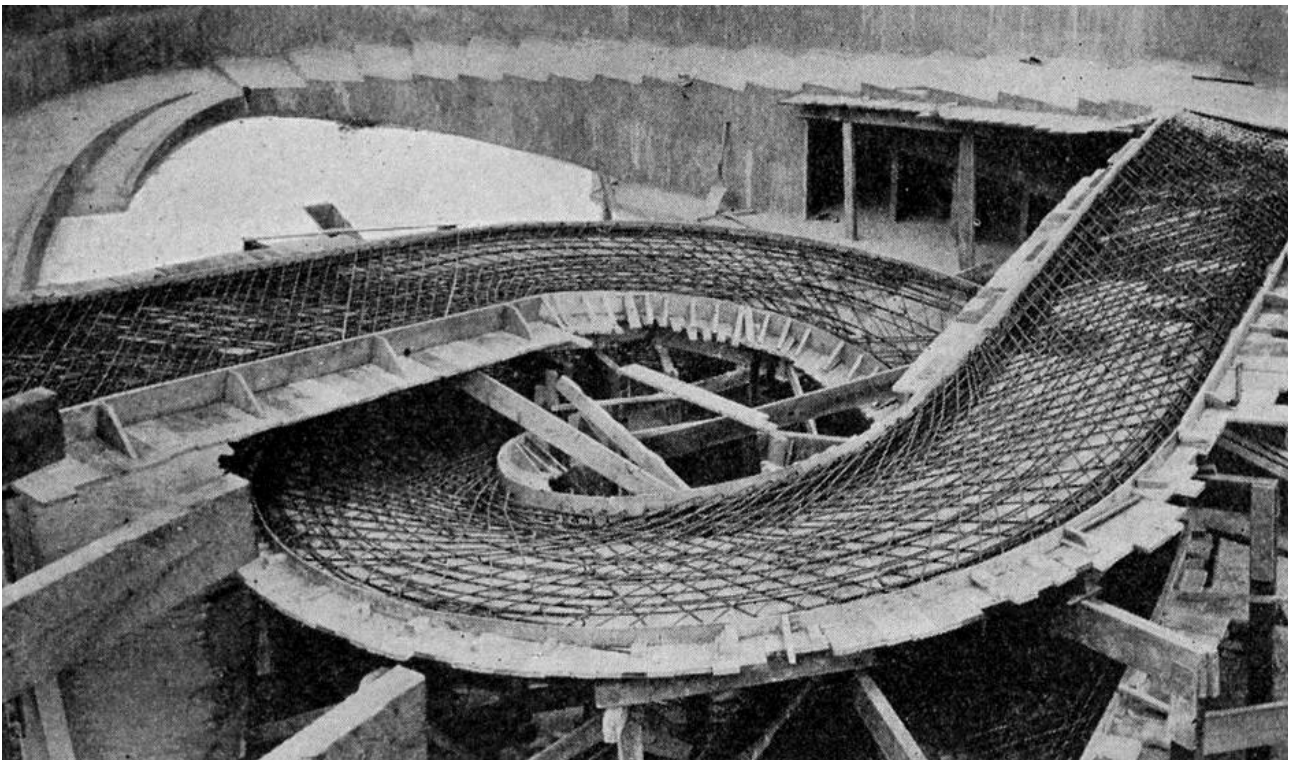
In this subtlety lies the key to Lubetkin's sophisticated approach to structure. Defying the contemporary platitudes of 'Functionalism' with its simplistic conflation of honesty and beauty, Lubetkin's rare vision lay in perceiving that structure should be expressed where it was significant but suppressed where it was not. In this solution he was assisted by the Danish engineer Ove Arup, who supported Tecton in the structural realisation of all its key works—though in this instance, according to participants, the calculations were undertaken by his younger recruit Felix Samuely, who reportedly resolved the Penguin Pool's daunting mathematical complexities over a single weekend. These were summarised as comprising 6 lines statically indeterminate, each section being subject to bending moments in vertical and horizontal planes, a torsion moment, an axial force and two shearing forces.

Beyond the structural gymnastics there are many other details to admire, for example, the semblance of centrifugal motion created by the series of overlapping slipways which chase each other round the perimeter promenade, or the alternating materials and colours—grey slate paving and red rubber compound—that further enhance the

pool's 'diameter' by alternating across the four walkway quadrants.

With its unique fusion of geometric energy, structural brilliance and theatrical bravura the Penguin Pool has invoked many associations. The Constructivists' preoccupation with the spiral and its symbolic Marxist connotations of 'progress' is perhaps the most direct, and would certainly have resonated with Lubetkin as a recent émigré from revolutionary Russia, where he had witnessed the double helix of Vladimir Tatlin's fabled Monument to the Third International. The theatrical stage sets of Meyerhold and Lissitsky with their implied suggestion of 'a world within a world' have also been cited as a possible source of inspiration.

Yet at the heart of his conception Lubetkin had a more philosophical proposition in mind—a particular vision of man's place in nature—as informed by his Marxian reading of science and evolution, and the distinction to be drawn between the kingdom of nature and the kingdom of culture. The Penguin Pool and his many other zoological works were to stand as normative statements of man's intelligent place in nature. Lubetkin's distinctive approach in the design and setting of his architecture lies in rejecting both camouflage and conquest as metaphors of intervention. Rather man's instrumentality was to be both explicit and benign, proclaiming, in his favoured description, a vision of 'nature tamed—not with a fist, but with a smile'.



A masterpiece of carpentry. J.L Kier & Co, 1934.



Symmetry on a diagonal axis. Photo by Ray Charter, 1987.

Such a stunning piece of architectural showmanship, it was inevitable that the Penguin Pool would become a mascot for the early Modern Movement in Britain, whilst providing Lubetkin himself with an international 'calling card' through its widespread publication and critical reception. 'It was that unique monument' the Penguin Pool by Lubetkin and Tecton, which first dramatically attracted the attention of the world to developments in England', wrote the American commentator Henry Russell Hitchcock in 1937.

Its zoological advantages were also acclaimed, at least initially. The first occupants apparently thrived and bred successfully, with the enclosure's clean lines and easy maintenance providing a healthy environment resistant to infection and the incidence of avian malaria more often experienced in simulated 'natural' exhibits. With ensuing developments in animal husbandry however this early success would later be challenged. Different (South African) birds were substituted for the original Antarctic species, their less gregarious nesting behaviour being unsuited to the closely spaced accommodation of the original design. To accommodate this changed pattern of use a series of incongruous wooden hutches were arranged around the perimeter walkways quite contradicting the abstract quality of the original conception.

In the mid-1980s, when the building had reached a state of considerable dereliction, I was privileged to undertake a major restoration of the Penguin Pool, working with Lubetkin himself, then in his 80's. This substantially secured the fabric of the structure, renewed the hydraulic services and reinstated the original colours whilst also incorporating judicious improvements to the nesting accommodation and diving tank. In 1987 Lubetkin together with Ove Arup, also by now an octogenarian, attended the re-opening ceremony and the pool enjoyed a new period of popular and critical acclaim. But more recently its fortunes have altered again and currently the birds have been removed altogether, leaving the exhibit empty and without its sense of humour.

These reversals represent a particular conundrum. While the changing culture of captive animal display reflects an increasing ambivalence over the ethical acceptability of zoos as such, there has been a parallel and growing appreciation of the outstanding architecture they have sometimes produced. Virtually all of Lubetkin's zoological works—some seventeen surviving structures including further pavilions at Whipsnade and Dudley Zoos—are now protected architectural monuments, introducing a dual conservation challenge—conservation of the build-



Cry for an unrealised world. Photo by John Allan, 1987.

ings and conservation of endangered species, now regarded as the principal justification for survival of the zoo itself—a reconciliation not always easily achieved. Zoological controversies aside, however, the architectural acclaim of the Penguin Pool remains undiminished, with it being statutorily protected at Grade I—the highest level of designation available in England.

And what of Lubetkin's dreams? There is no doubt that

the Penguin Pool remains an icon of early Modern architecture—radiant with innocent optimism. But half a century later Lubetkin would reflect otherwise. 'The philosophical aims and orderly character of those designs are diametrically opposed to the intellectual climate in which we live... My personal interpretation is that these buildings cry out for a world which has never come into being'.

The question for our age is whether that cry is still heard.

#### References

- The Architect's Journal, June 14, 1934, 856–859, London, The Architectural Press.
- The Architectural Review, July 1934, 17–19, London, The Architectural Press.
- The New Architecture and the London Zoo*, (Film) by Lazlo Moholy-Nagy, for the Museum of Modern Art, New York, and Dept. of Architecture, Harvard University, 1936.
- Hitchcock, H. R., *Modern Architecture in England*, catalogue for the Museum of Modern Art, New York, 1937, 25.
- Concrete and Clay*, (film), presenter Malcolm Coe, London Weekend Television, 1987.
- Allan, John, 'Tectonic Icon Restored', RIBA Journal, London, February 1988, 30–32.
- Allan, John, 'Landmark of the Thirties Restored', *Concrete Quarterly* 157, London, April/June 1988, 2–5.

- Allan, John, *Berthold Lubetkin—Architecture and the tradition of progress*, RIBA Publications, London, 1992, see Chapter 6. (2<sup>nd</sup> Edition to be published by Black Dog, London 2012).
- Allan, John, *Berthold Lubetkin*, London, Merrell Publishers, 2002.
- Guillery, Peter, *The Buildings of London Zoo*, Royal Commission on the Historical Monuments of England, London, 1993, 82–84.
- Berthold Lubetkin quoted in article 'Historic Pioneers; Architects and Clients', *The Architect's Journal*, 11 March, 1970, 595.

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