

Zoo Architecture

The Building Typology of Large-scale Constructions in Zoological Gardens

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Abstract—In this research, zoo architecture is mapped out in a systematic manner which has not been in evidence until now. On this basis, the development of this building category is firstly -examined by addressing theoretical, historical and typological aspects. It may be noted that large-scale constructions in -zoological gardens can be seen as an autonomous building typology which, in common with any other category, follows the societal trends and scientific findings of the respective -epoch. A selection of thirty historic buildings from the past 200 years helps to raise the profile of this architectural category. In addition, this research defines ten design parameters which may serve as a reference guide for the planning of zoo centres. The categories defined specifically within the framework of this research are set out in the concluding -analysis of each of ten contemporary large-scale constructions for -elephants, primates and large cats. The results show that the methodology of the theoretical approach, historical architectural chronology and identification of building typologies followed by the elaboration of strategic planning recommendations is well-founded.

Architecture, Zoology, Building Typology, Building History

I. BUILDING FOR ANIMALS THE STALKING OF A RARE CATEGORY

The aim of this work is to address a gap in research. Since the dissertation by Hellmut Heinsdorff in 1967, an academic synopsis of building for animals has not yet been published which fathoms the complexity of this issue. In more recent years, only Philipp Goldschmidt has presented a paper on constructions tailored to large cats in 2010 with a focus on surface analyses and spatial arrangements. This work has thus set itself the challenge of presenting a comprehensive manual and informed planning resource, almost half a century -after Heinsdorff. Research here has a sole focus on accessible large-scale constructions which have been masterminded by architects. Garden and landscape architecture is only -accorded peripheral mention. Similarly, the overall urban planning concept behind zoos is examined merely briefly since this is relatively trivial in terms of the design parameters of high-rise structures. Notions of architectural theory are

examined and analogies between zoology and architecture carved out. That Which Unites Architects and Zoologists, whereby specific terms are viewed in context. The development of zoo architecture over the past 150 years is outlined in the section *From Colonialism to Democracy. How the Relationship between Man and Beast has Changed throughout Architectural History*. Here, the focus is on the completed building. Design parameters for a typology of zoo buildings are established in the section *From Prisons to Stage Construction*. These may serve as a future reference and be aligned with the evolving role of wildlife in a post-industrial society. The compositional principles are examined here.

The content of this research is based on an evaluation of the scarce literature devoted to this subject and a collection of documentation – thus all the more extensive – on zoo buildings which has been published in periodicals and architecture-related Internet portals. Only completed buildings, but not projects or competition tenders, are subject to analysis. The primary source of the explanatory texts introducing the buildings is primarily attributed to textual material provided by zoo administrators or architects for the purpose of this -research project. Editorial amendments have been made to the building descriptions written by architects in order to adopt a uniform style. However, content and meaning have not been altered. All buildings depicted herein are presented in both general and detailed terms. The contemporary projects of the second main chapter were realised primarily - between 1995 and 2015.

Buildings have been chosen following a repeated critical examination and represent a personal selection, corresponding to the objective of this research. These do not reflect the significance or benchmark status of individual architectural styles and specific floor plan options. Several projects have been incorporated since these manifest rare spatial -arrangements or combinations. This research seeks to deliver an appraisal of typifying examples. An empirical analysis and thorough documentation of all large-scale constructions in European zoos is thus unable to be drawn up.

II. LEARNING FROM CHARLES DARWIN THAT WHICH UNITES ARCHITECTS AND ZOOLOGISTS

Although architects lent the most frequently constructed building types a framework composed of thoughts and words right from the outset of architectural theory, the niche -topics of design and construction are largely met with muteness. During the course of the research relating to the subject of this work, one inevitably stumbles upon theoretical writings on architecture from the mid-nineteenth century that have been influenced by the findings of naturalists. This was the period of intensive research journeys (Charles Darwin in South America as of 1831; David Livingstone in Africa as of 1849), but also the first foundations of zoos, such as those in Berlin (1844) or Stuttgart (1846). Architectural theory at the time was marked by late-classicist matters of style and romantic analogies to nature. Building types such as theatres and both art and cultural historical museums abounded, as well as the intellectual analysis of these. It speaks for itself, therefore, that the debate on architecture produced a theory of zoo buildings as early as the nineteenth century, since the requirements for prisons, theatres and museums are at one with this type of construction task.

It may be determined, however, that a fundamental theoretical review of architecture in zoological gardens came about only approximately 100 years after the first zoo centres. The Berlin-based architect Heinz Graffunder and the Basel-based architect Arthur Dürig play a key role in this regard, as -attested to by numerous articles and lecture notes authored by them. However, the theory of zoo architecture is not only predicated on the basic research of Graffunder and Dürig. Its origins are traceable to the philosophy of Georg -Wilhelm -Friedrich Hegel, the architectural theory of Gottfried -Semper and the art-historical contributions of August Schmarsow. In addition, the zoological findings of the time and their terminology are incorporated into the discussion of this research. A theory of zoo architecture would be incomplete without an examination of the terminology applied to both architecture and zoology.

III. FROM COLONIALISM TO DEMOCRACY THE EVOLUTION OF ARCHITECTURAL HISTORY

The architectural history of zoos is a reflection of Western humanity's relationship with animals. Christian values, academic emancipation and political power are key factors in this. Developments always crystallised in the form and reform of architecture. In common with general notions of appealing architecture, humanity's relationship with architecture and animals also changed. Therefore, the respective understanding of what an architecture accepted by society – and thus considered appropriate – constitutes for zoological gardens was permanently subject to change. The zoo evolved from a collection of living trophies and a museum with live exhibits to an amusement park with a moral duty. To date, five generations of zoo buildings may be identified which are based on a temporal chronology and illustrate the ever-changing perception held by humans regarding wildlife – from

a mere showpiece to an entity with rights. The individual periods of time reflect political, zoological and design aspects. Although the first three generations of zoo architecture may be clearly assigned to the fields of politics (I: Buildings in the Colonial Style), zoology (II: Barless Structures) and design (III: Functionalist Buildings of the Modern Era), politics and zoology are intertwined in the fourth generation (IV: Land Recultivation and Landscaping). In contrast, the fifth and thus youngest generation combines the aspects of design and zoology (V: Branding through Large-scale Constructions). Any such systematisation in terms of built architecture in zoological gardens has not yet been elaborated, -although the history of the zoo has been described countless times in the meantime. Consequently, it is risky to refer to a historic evolution of a building type and its -appearance. Nonetheless, this historical overview allows for an -understanding of the development of building forms and spatial concepts prevailing today. It is illustrated how modern the structures in zoological gardens were during their respective periods, -although a complete account of the architectural history of the zoo has been omitted in this research. Rather, the focus is essentially on the contextualisation of zoo architecture in the respective epochs of their creation. In this research an attempt has been made to prove that zoological gardens were an experimental ground for a new building type.

A. *The First Generation of Zoo Architecture: Exhibition Structures in the Colonial Style*

The first generation of zoo buildings emerged around the mid-nineteenth century. It is marked by a heterogeneous architectural vocabulary and colonial influences. Large-scale constructions for exotic wildlife, which had been -imported from foreign countries as living trophies, provide the architectural backdrop for these “exhibits”. It is also striking to note the stylistic links between zoo buildings and contemporary archaeological research on the sites of ancient civilisations.

B. *The Second Generation of Zoo Architecture: Barless Structures amid a Panoramic Landscape*

It was only circa 1900 that an impetus in zoo architecture could be defined for the first time owing to Carl Hagenbeck's panoramic zoo which rid the hitherto existing animal enclosures of their quaint pavilion-like appearance and liberated these to form an autonomous architectural landscape. Animals were no longer separated from spectators but, as it were, visually freed from their cages and presented on a “natural stage”.

C. *The Third Generation of Zoo Architecture: Formalism and Functionalism*

If zoo architecture was marked by Hagenbeck's idea of the domination of landscape over architecture from the beginning of the twentieth century into the 1920s, today modern designs arising from functionalism are ushering in a new era. The shift away from landscaping is characterised by formalism, the eschewal of exotic ornamentation and a minimalist architectural vocabulary (for example, Diergaard Blijdorp in -Rotterdam).

D. *The Fourth Generation of Zoo Architecture:*

The Landscaping of Buildings and the Enclosure of Nature

With the emancipation of zoology in the second half of the twentieth century, architecture too set out to embody a conscious orientation towards nature. As of the 1970s, the landscaping of architecture on the one hand and the methodical enclosure of nature on the other are common features among fourth-generation zoos. Architecture disappears to a certain extent from zoological parklands. Landscape architectural elements are increasingly prevalent. This development can in part be attributed to the report of the Club of Rome (*The Limits to Growth*, 1972) and the awareness of a more resource-saving approach to nature which came to the fore during that period.

E. *The Fifth Generation of Zoo Architecture:*

Branding through Iconic Large-scale Constructions

The trend towards the so-called adventure zoo asserted itself at the beginning of the 1990s. Since then, many traditional facilities have been remodelled upon this basis. Thematic architecture and story-telling play a significant role in today's adventure zoos. On the other hand, several iconic buildings which in turn divert attention from the animals have emerged in zoological gardens.

IV.

FROM PRISONS AND THEATRES TO MUSEUMS

PARAMETERS FOR A TYPOLOGY OF ZOO BUILDINGS

Zoological gardens represent a special form of cultivated -coexistence between man and beast. Animals are not kept primarily as livestock, in the sense that direct economic benefit is to be drawn from this coexistence. Moreover, the zoo is devoted to research, the preservation of animal species and, furthermore, breeding programmes which allow the release of endangered species into their hunting grounds. To that -extent it has strayed from its original function: to provide "gardens geared to the general public with enclosures and animal -houses for keeping and presenting – predominantly exotic – wildlife". One distinguishing feature of today's zoological gardens is that humans and animals share the same habitat. Zoos lie mostly in densely populated areas – in the broadest sense within residential developments since the zoo is dependent on visitors. One cannot, therefore, speak of a beast's natural territory. Its habitat can however be simulated – except in the case of indigenous animals. The wildlife -remains constrained and its natural inclination to move around is restricted, in light of the need to prevent it from escaping.

Three factors remain essential in this context: confinement, presentation and, increasingly, dissemination of knowledge. Constraint, protection mandates and controlled freedom are the aspects discussed in the Building Typology section. This triad arguably best describes the relationship between the captor and the captive against the backdrop of the development of construction typology. At the same time, the influence of the main objectives of a zoo centre – protection, staging and education of the public – upon the architectural

and creative execution of the buildings in the zoological garden is examined. Therefore, the focus is placed upon basic research into zoo architecture. Since this has been examined from the point of view of individual aspects in its history, it has not been possible until now to establish a comprehensive typology of zoo buildings.

A highly succinct repertoire of design guidelines could be drawn up on the basis of three comparable architectural categories, the typologies of which are scientifically and generally recognised and which can also be identified within the typology of zoo buildings we wish to define, namely prison buildings (security and space constraint), stage design (display and presentation) and museums (education and pedagogy). In addition, in this work three further content-related categories have been established which facilitate a more nuanced systematisation.



A. *The Aesthetics of Constraint*

Zoo Buildings as Prisons

There is no doubt that the typology of zoo buildings has its origins in prison architecture. The requirements for imprisonment or spatial segregation have changed little. When it comes to prison buildings, the separation of individuals on disciplinary grounds is uppermost. Although a zoo centre is not exclusively geared to the disciplining – or even the taming – of wildlife, structural requirements lend themselves to comparison, in particular spatial separation.

B. *The Aesthetics of Perspective*

Zoo Buildings as Theatres

When it comes to building typology, the development of zoo architecture also presents similarities with the development of theatre construction. The relationship between the auditorium and stage space is at the forefront of consideration. Just as the theatre has undergone a metamorphosis from a proscenium stage into an in-the-round stage, a comparable conversion of zoo buildings from caged enclosures offering confined vistas to immersive spaces can similarly be traced, whereby the distance between bystanders and animals seems to diminish. In common with a staged setting involving -actors, set -design and spectators, it is essential to simulate the scenery to be displayed in the zoo with artificial elements.

C. *The Aesthetics of Knowledge*

Zoo Buildings as Museums

The zoo as an institution has evolved out of the natural history museum. In terms of building typology, it initially took a roundabout approach through prison and theatre architecture in order today to integrate elements of the museum as an important constituent part within the dissemination of knowledge. To that extent zoo centres of modern times display properties typical of museums. These may in particular include visitor guidance (individual movement within the space), dissemination of knowledge (sensory perception of the space) and exhibits (authenticity of the space).



1) *Staging of the Natural Environment*

The staging is chosen to evoke a certain effect and does not necessarily require theatrical spaces. The stage for animals in zoos is able to manage on natural looking components.

2) *Staging of the Event*

In recent years, zoological gardens have become a fixture of a city's cultural programme. This refers not only to the zoo as an institution that mediates between an educational establishment and a research facility; in many places, the zoological garden has become a location that competes with unusual venues.

3) *Staging of Symbolism*

Symbolism links the building to its contents. It stands to reason in zoos that this visual language refers to the animal and its natural environment. However, symbolism in zoos is still ongoing; often elements from the habitat of the individual species are also used.

[1] Meuser, Natascha, "Architektur im Zoo. Theorie und Geschichte einer Bautypologie," DOM publishers, Berlin 2017