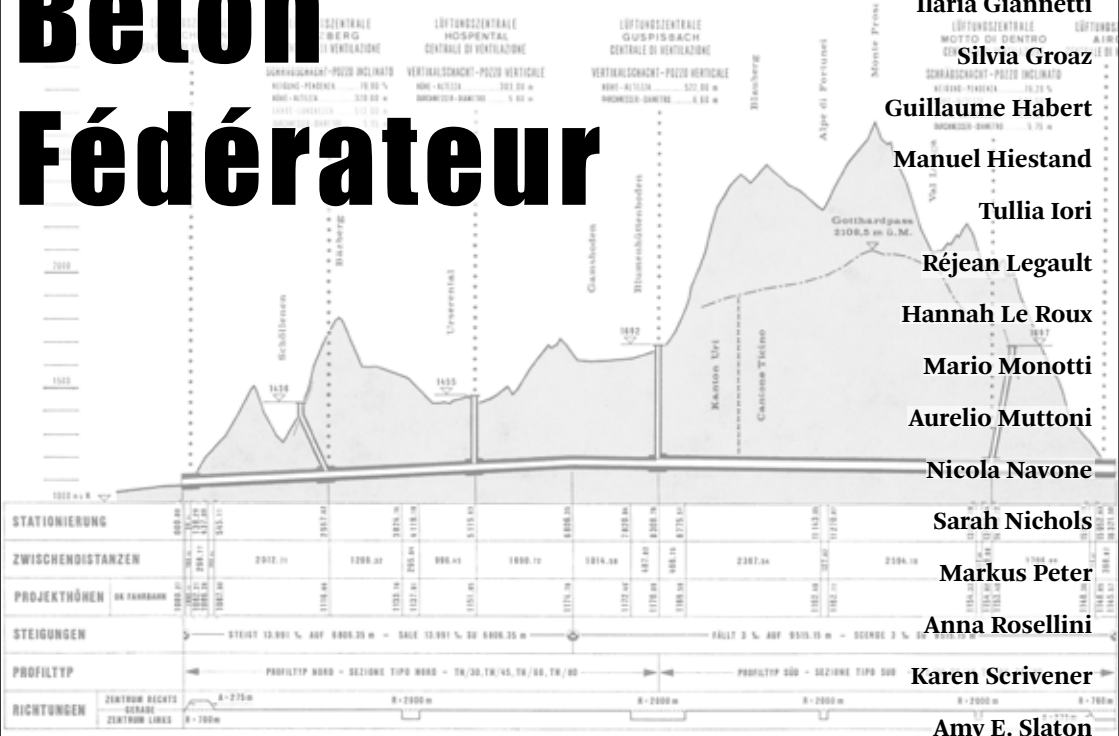
Béton Fédérateur



Salvatore Aprea

Marcel Bächtiger

Eugen Brühwiler

Jürg Conzett

Adrian Forty

Roberto Gargiani

Ilaria Giannetti

Silvia Groaz

Guillaume Habert

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Réjean Legault

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Mario Monotti

Aurelio Muttoni

Nicola Navone

Sarah Nichols

Markus Peter

Anna Rosellini

Karen Scrivener

Amy E. Slaton

Laurent Stalder

Lorenzo Stieger

Martin Tschanz

Workshop
25 January 2019 10:00–19:00
26 January 2019 9:00–18:00
RZ F 21, Clausiusstrasse 59, ETH Zurich
www.gta.arch.ethz.ch/events

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Béton Fédérateur

The workshop proposes to study the transformation of the Swiss territory in light of concrete, from the latter half of the 19th century to the present day, from the first feats of civil engineering to contemporary major rail, road, and energy infrastructures. In particular, it aims to retrace how various structures built independently of one another (dams, bridges, bunkers, as well as storage depots, and housing) came to constitute, in the course of the 20th century, an interdependent infrastructure network covering the Swiss territory in its entirety and encompassing everything in its path, from artificial networks (energy, transport) to natural ones (waterways), from the built environment to topography.

The workshop will bring together national and international scholars from the fields of history, history of architecture, history of technology, and social history. The first day of the symposium will be devoted to methodological questions, covered by international experts, followed by a panel that will open the field to current research on concrete. The second day will propose a broad-ranging survey on key studies in Switzerland.

Friday, 25 January 2019

An International View

10:00–10:30 ***Welcome and Introduction***
Laurent Stalder ***Switzerland – A Technological Pastoral***

10:30–12:00 Amy E. Slaton ***Knowing Concrete: Some Historiographic Possibilities***

Adrian Forty ***A "Global Medium", or "an Agent of Territory"?***

Hannah Le Roux ***AC: The Pressing of an Asbestos-Cement Development Complex***

Discussion

12:00–14:00 Lunch break

14:00–15:30 Réjean Legault ***The Making of Architectural Concrete: Between Invention and Discovery***

Tullia Iori ***The Role of Reinforced Concrete in the Italian School of Engineering***

Roberto Gargiani ***The Primitive Frame in Concrete of Mies and SOM***

Discussion

15:30–16:00 Coffee break

16:00–17:30 Jürg Conzett ***Attitudes Towards the Use of Concrete in Swiss Bridge Building***

Eugen Brühwiler ***Non-invasive Interventions on Three Concrete Structures of High Cultural and Aesthetic Value***

Anna Rosellini ***Primordial and Ideological Values of Matter: Concrete in Art***

Discussion

17:30–18:00 Coffee break

18:00–19:00 ***Futures Roundtable***
Guillaume Habert Mario Monotti Markus Peter
Karen Scrivener

Saturday, 26 January 2019

A Swiss View

09:00–10:30 Aurelio Muttoni ***Does a "Swiss Federal Building Identity" Exist?***

Martin Tschanz ***Concrete Architecture? The Examples of St Nicolas in Hérémence and the Capuchin Monastery in Sion***

Salvatore Aprea ***Concrete Buildings in French-speaking Switzerland: The Predominance of Frame Structures***

Discussion

10:30–11:00 Coffee break

11:00–12:00 Nicola Navone ***Concrete in the Canton of Ticino: An Overview***

Ilaria Giannetti ***The N2 Chiasso–San Gottardo Motorway: The Design and Construction of 143 km of Concrete***

Discussion

12:00–14:00 Lunch break

14:00–15:30 Sarah Nichols ***Building and Blowing-up the Monolith***

Manuel Hiestand ***Cement for Swiss infrastructure***

Lorenzo Stieger ***Both High-rise and Bunker: The Terrassenhaus in Switzerland***

Discussion

15:30–16:00 Coffee break

16:00–17:00 Silvia Groaz ***Banham's New Brutalism and the "Swiss School"***

Marcel Bächtiger ***Béton is a State of Mind: On the Representation of Concrete in Swiss Cinema***

Discussion

17:00–18:00 Aperitif

Laurent Stalder, ETH Zurich

Switzerland – A Technological Pastoral

In architectural discourse of the recent past in Switzerland, concrete has been related mostly to the architectural object, its technique, surface and texture, furthering an understanding of architecture as an autonomous discipline. This approach has led to a highly differentiated formalist discourse on which the success of Swiss architecture has relied. Considered as an autonomous object, architecture could be addressed as a purely formal and thus artistic problem, leaving aside the larger environment in which buildings are embedded. And even where the large concrete infrastructures – bunkers, dams or power plants – were investigated, with a few exceptions the focus was put on the individual object, minus any reference to the corresponding networks. Yet, thanks to the new material, these infrastructures have not only left deep traces on the physical appearance of the country, but have also shaped its perception. Since the last years of the nineteenth century, architects and engineers have been reflecting on this transformation in projects, pamphlets or visionary drawings, allowing a history of Switzerland as a technological pastoral to be written.

Amy E. Slaton, Drexel University Philadelphia

Knowing Concrete: Some Historiographic Possibilities

For some time now, ambitious scholars of building have been tracing historical trends in architecture and engineering as expressions of imperial expansion, national identity formation or other flows of power. Explanatory projects such as these, including histories of concrete use, can be further advanced by applying an ontological perspective. Drawing on both history and STS, this talk suggests in particular that the idea of "historical context" – the notion that prevailing cultural or political circumstances condition the uptake of concrete in any given episode – might itself helpfully be problematised. That is: the process of analytically demarcating materials' characteristics from materials' applications and siting, and the naturalising of categorical distinctions between materials and their human handlers, may in fact hide significant causal forces shaping the built environment. An ontological perspective alternatively suggests that in any historical instance, a given material (here, concrete); the desirability of its use (for a modernised skyline, affordable housing, durable infrastructure or efficient warfare); and those seen to be its authoritative handlers (concrete producers, architects, engineers or government authorities) come into being together. How concrete has historically become knowable to and with its advocates; its users; and all those who live with its labour, economic, security and environmental consequences, may thus be thrown into clearer perspective.

Adrian Forty, University College London

A "Global Medium", or "an Agent of Territory"?

Can a substance that is a global medium also define a territory? This question – by no means straightforward – lies at, or close to, the heart of concrete's remarkable, worldwide success. Reflections on the paradox suggest how it might productively be used to enlarge both our understanding of concrete, but also of the operations through which territories are defined.

Hannah Le Roux, University of the Witwatersrand Johannesburg

AC: The Pressing of an Asbestos-Cement Development Complex

As a likely consequence of legal challenges to asbestos-cement companies and their owners, the corporate archives of Eternit and its holdings are inaccessible for research. In this absence, the architectural media becomes the primary record of the mid-twentieth-century history of the Swiss asbestos-cement industry. A magazine for architects, *AC*, the *International Asbestos-Cement Review*, was overseen from Eternit's plant and headquarters at Niederurnen, globally circulated and associated with various conferences and think-tanks on asbestos-cement use in architecture. As such, it constitutes a significant record of the creation of new markets between the mid 1950s and 1980s. The presentation will chronicle *AC*'s activities and content as a proxy history for Eternit in the "developing world", exploring its evolution in relation to that of a complex of capital, industrialisation, transnational housing policies and avant-garde architectural thought.

Réjean Legault, Université du Québec à Montréal

The Making of Architectural Concrete: Between Invention and Discovery

Architectural concrete occupies a central place in twentieth-century architecture. Inspired by Le Corbusier's *béton brut* at Marseilles, many post-war American practitioners – Paul Rudolph, I. M. Pei and Louis Kahn chief among them – developed novel expressions of exposed concrete. Privileging intentionality, historians have often presented them as "inventors" of their diverse materialisations. Conversely, some theorists have argued that materials in architecture are always involved in a process that allows them "to have their say". And indeed, close studies of the design process reveal that architects are often drawn into what might be described as a "battle of wills" with their chosen material, and that the end results are as much unexpected discovery as controlled invention. Informed by various theoretical positions on material agency, I will show how several key post-war explorations of exposed concrete came out of a productive tension between architectural intention and the material's conditions of existence.

Tullia Iori, Università degli studi di Roma Tor Vergata

The Role of Reinforced Concrete in the Italian School of Engineering

In the 1950s and 60s Italian engineering attracted international attention through a series of highly original structural works. In the transition from the reconstruction period to the economic miracle years, there were numerous opportunities to create large-scale works: the construction of the Autostrada del Sole, the 1960 Rome Olympic Games, the Centenary of the National Unification, the Italian-style skyscrapers in Milan, and more. In this fervour, a veritable school of structural engineering took shape.
The brilliant achievement of this engineering was the culmination of a long trial period, which started with reinforced-concrete technology coming into use in the early twentieth century, and went on uninterrupted during the autarchic regime and the World War II years. The boom in Italian engineering was an exciting but short-lived phenomenon. It disappeared during the global economic crisis that followed, and in subsequent works – with a small number of exceptions – this golden-age identity became lost forever.
The contribution aims to share some of the results of the SIXXI research programme, conducted at the Rome Tor Vergata University.

Roberto Gargiani, EPF Lausanne

The Primitive Frame in Concrete of Mies and SOM

Mies's architecture is most renowned for his use of steel in his works. However, he also contributed crucially to the affirmation of a type of exposed reinforced-concrete frame which transformed 1950s Chicago into an American Le Havre. His research on reinforced concrete was intertwined with that of SOM's Chicago office into skyscrapers and wide spans, generating the new and original reinforced-concrete Chicago Frame.

Jürg Conzett, Chur

Attitudes Towards the Use of Concrete in Swiss Bridge Building

What are the dominant conceptual thoughts which determinate the use of concrete in Swiss bridge building? I try to outline the different forms of common sense or individuality that lead to the variety in Swiss concrete bridges. Whether coming from functional needs, laws, standards, theories, entrepreneurship, national and international exchange, personal experience or silent reflection, what were the dominant influences on the use of concrete? An interesting example is an exchange of letters between Alexandre Sarrasin and Emil Mörsch concerning the construction of slender concrete beams. Or how did engineers find the form of the arch bridge? Do we find personal preferences in the arrangement of post-tensioning tendons? The aim of the lecture is to outline a type of network spanning different relationships and tied to the same material – concrete.

Eugen Brühwiler, EPF Lausanne

Non-invasive Interventions on Three Concrete Structures of High Cultural and Aesthetic Value

This lecture reports on the restoration of three reinforced concrete structures of high cultural and aesthetic values located in Switzerland: the Goetheanum theatre building at Dornach SO, the Guillermaux road bridge at Payerne VD and the Chillon motorway viaduct near Montreux VD. The projects highlight the importance of understanding the cultural values of engineering structures, and concrete architecture in particular, when undertaking interventions to satisfy modern use demands. Non-invasive interventions for re-establishing durability and for structural strengthening were developed and realised; and in all three cases, UHPFRC (Ultra-High Performance Fibre-Reinforced Cementitious Composite material) was applied. It is shown how moderate-cost, non-invasive interventions were performed on "old" concrete structures with adequate respect for their cultural and aesthetic values in order to improve them in view of a second service duration. Finally, principles of modern structural engineering related to existing structures are outlined.

Anna Rosellini, Università di Bologna

Primordial and Ideological Values of Matter: Concrete in Art

With the questions of the nature, the truth and the meaning of materials as a backdrop, the contribution aims to present the experimental works made in concrete by modern and contemporary artists. Artists have created a corpus of works that delve into the artistic potential of concrete and the various ways of processing it. They have increasingly made a special use of concrete, transforming it into one of the most important materials in art, particularly since the second half of the twentieth century. The contribution will place concrete artworks created from the post-Second World War period onwards in a thematic and chronological sequence, highlighting several key issues. These artistic phenomena will also be presented in their cultural, political and technical context, and in relation to parallel developments in architecture and engineering. The final goal of the contribution will be to define the meaning and the artistic potential that artists have been able to discover in a material so far used mainly for its structural and technical performances.

Aurelio Muttoni, EPF Lausanne

Does a "Swiss Federal Building Identity" Exist?

At beginning of the twentieth century, reinforced concrete rapidly replaced timber and masonry construction in buildings, bridges and other engineering works, thus becoming one of the key symbols of modernity. The impressive rapidity of this change introduced elements of a common building language in Switzerland, potentially identifiable as a quasi "Swiss federal building identity". Therefore, if this concept truly existed, a number of theses require investigation and verification. This applies in particular to the role of various actors and institutions in disseminating the new material in unison, countrywide and amongst architects and engineers. This includes: (i) the influence of Samuel de Mollins, Hennebique's agent for Switzerland; (ii) the role of the journals *Schweizerische Bauzeitung* and *Bulletin Technique de la Suisse Romande*; (iii) the role of a "federal education"; (iv) the role of technical building codes; and (v) the role of Robert Maillart, whose concrete bridges and structures were greatly admired by architects. However, this "identity" and the question of its existence are best treated not simply by examining Switzerland, but also by comparing the Swiss case with developments in neighbouring countries.

Martin Tschanz, ZHAW Winterthur

Concrete Architecture? The Examples of St Nicolas in Hérémence and the Capuchin Monastery in Sion

Two key studies focus on two ecclesiastical buildings of the 1960s, built only few kilometres apart in the Canton of Wallis. Although concrete is decisive for the expression of both examples, the two architectures are of very different, if not opposite sorts. The church St Nicolas in Hérémence (1962–1971) by Walter Maria Förderer is the work of a sculptor; it has a monolithic character and an almost rock-like quality. In contrast, the Capuchin Monastery in Sion (1962–1968) by Mirco Ravanne is a structure formed of elements, full of separate layers, gaps and joints. The striking difference between the two buildings is an ideal starting point from which to formulate some general thoughts about the multiple natures of concrete and the potentials offered to architecture by this strange and unprincipled material.

Salvatore Aprea, EPF Lausanne

Concrete Buildings in French-speaking Switzerland: The Predominance of Frame Structures

This contribution gives an account of how concrete construction developed in French-speaking Switzerland since the end of the nineteenth century. The narrative is based on original sources from the Archives de la construction moderne (Acm) and on data and facts from local technical literature. Most attention is paid to reinforced-concrete frame structures. This method of construction had been well-rooted in French-speaking Switzerland since Samuel de Molin became a dealer of the Hennebique system in Lausanne in 1892. Hidden behind cut-stone facades (Jean Taillens and Charles Dubois, UBS Building, Lausanne, 1922) or skilfully exposed (Fernand Dumas and Denis Honegger, University of Fribourg, 1937–1941; Marc Piccard, College du Belvedere, Lausanne, 1952–1965), the reinforced-concrete skeleton was a capital resource for architects and engineers, and was developed over the decades, under the influence of cultural, technical and formal factors.

Nicola Navone, Università della Svizzera italiana

Concrete in the Canton of Ticino: An Overview

Dams, tunnels and motorway viaducts, schools, libraries, sports and leisure facilities, collective housing, single-family homes – reinforced concrete has played a fundamental role in the construction of the Canton of Ticino in the twentieth century. To what extent, however, does this role reflect the condition of the sub-Alpine canton as a "threshold" – and at the same time as a link – with respect to Swiss and Italian architectural cultures? And what are the distinctive features of Ticino's contribution in this context? This paper presents a survey of these two main issues.

Ilaria Giannetti, Università della Svizzera italiana

The N2 Chiasso–San Gottardo Motorway: The Design and Construction of 143 km of Concrete

Based on an exploration of the historical archive of Ufficio Strade Nazionali and the private archives of engineers, the reconstruction of the material history of the N2 Chiasso–San Gottardo has opened up novel investigation perspectives about the design and construction of the Ticino motorway within the history of structural engineering. The authorship of Rino Tami, the architectural consultant of the Ufficio Strade Nazionali since 1963, dovetailed with what was a daring collective adventure, simultaneously involving, engineers, construction firms and manufacturers in the design of each single "artefact" – viaducts, portals, tunnels. Combining together architectural theories, regional planning, methods of calculating structures and a "craftsmanship" of construction, with its 143 km of concrete the motorway embodies the social, political and cultural histories of the Canton of Ticino in the second half of the twentieth century.
The study is part of the Swiss National Science Foundation (SNF) research project "Architecture in Canton Ticino, 1945–1980", directed by Nicola Navone, with the further aim of widening the debate on the structural-engineering heritage of the canton.

Sarah Nichols, ETH Zurich

Building and Blowing-up the Monolith

Until World War II, concrete – like any other material – was used in moderation. When construction began again after the war, concrete poured across the Swiss landscape, reshaping everything from the subterranean to the Alps. Poised at the turning point between these two periods is the Zementhalle exhibition for the 1939 Swiss National Exhibition in Zurich. In it, the cosmos of concrete was displayed under a soaring, thin concrete shell by Hans Leuzinger and Robert Maillart. The exhibition hall and the exhibition itself stood in contrast to one another, presenting, in places, competing visions for what concrete should be. While the monolithic shell was a vision of utmost material restraint, the palette of concrete products underneath it suggested another view, namely

an agenda of ubiquity. Using the Zementhalle as a point of entry, this talk will examine the relations between limited and potentially unlimited material use, between the material and construction industries, and between architect and engineer.

Manuel Hiestand, Wollerau

Cement for Swiss infrastructure

Without cement, no concrete. This article describes the start of the Swiss cement industry in the late nineteenth century at a firm-based level. The industry itself installed harmonised standards for quality assurance and organised supply within what was a cartel. These two factors provide information about how the growth-potential of the Swiss producers was restricted and to understand how strong an impact they had on the affiliated industries. Overall, the study reveals insights into how the supply-side of the industry was organised and why cement – in form of concrete – was the most widely-used material in transforming the territory of Switzerland.

Lorenzo Stieger, ETH Zurich

Both High-rise and Bunker: The Terrassenhaus in Switzerland

Since the early 1960s, like hardly any other dwelling form the rapid proliferation of the hillside *Terrassenhaus* (terraced house) has expedited the transformation of the Swiss landscape. Legal, technical and constructive advancements in the building sector eventually facilitated the exploitation of the steep topography by using this building type, which was celebrated by its supporters – despite the historical evolvement – as a new, modern and specifically Swiss dwelling form. Nevertheless, this initial popularity soon gave way to profound criticisms concerning the architecture's amorphous design. The typology defied the notion of common urbanist categories by transgressing the traditional distinction between a house and the city, by addressing both architectural and infrastructural aspects and, not least, by simultaneously emphasising both the individual and the collective. As the buildings and projects by local architects from the period exemplify, the core strength of the *Terrassenhaus* lies precisely in this ambiguous character, whose potential for urban design has barely been recognised and exhausted as such.

Silvia Groaz, EPF Lausanne

Banham's New Brutalism and the "Swiss School"

Reyner Banham's book *The New Brutalism: Ethic or Aesthetic?* represents a pivotal shift in the critical construction of one of the most ambiguous yet successful architectural categories of the second half of the twentieth century: the New Brutalism. The proposed contribution intends to address the instances that led to the publishing of the book in 1966. Based on archival material, the paper sheds light on an entangled process that involved different personalities, and which in turn contributed both to the international success of the New Brutalism phenomenon and its problematic end.
This investigation also allows the rationale behind the choice of a series of examples to be questioned, as well as examining the significant role played by what Banham recognised as a "Swiss school" and its contribution to the interpretation of an issue which appeared as a crucial component of the New Brutalism, namely the habitat.

Marcel Bächtiger, ETH Zurich

Béton is a State of Mind: On the Representation of Concrete in Swiss Cinema

Practically since the day of its invention, cinema turned its gaze towards the Swiss landscapes, thereby demonstrating a peculiar interest in the frictions between both tradition and progress and in the continuous transformation from cultivated Nature to operated infrastructure. Being the most visible and recognisable expression of this transformation, "*béton*" plays a crucial role in the history of Swiss films, appearing not only as a physical reality that shapes the contours of the territory, but also as a recurring metaphor that alludes in various ways to the mental state of its inhabitants. This case study sketches out a short filmography on the topic. Attention is focused on the 1970s and 1980s, when films like Alain Tanner's *Messidor*, Fredi M. Murer's *Grauzone* or Christian Schocher's *Reisender Krieger* adopted a clear critical stance towards the built environment of Switzerland, yet were nonetheless unable to escape the strange fascination of its concrete landscapes.

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Graphic Design
Philippe Mouthon, gta Verlag

Support

FNSNF
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