following the flow

the revival of fluid architecture in the 21st century

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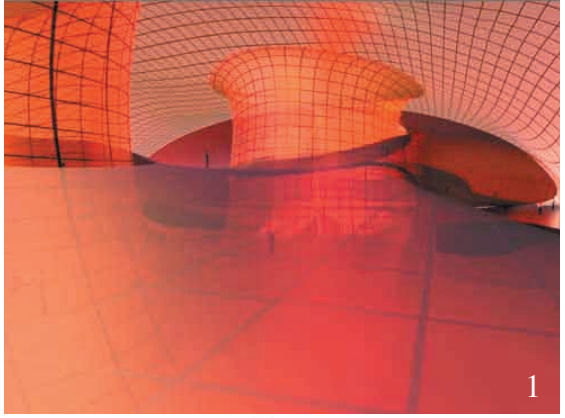

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introduction

The labelling of new, computer aided designs based on organic shapes as blobs, has resulted in a need for further investigation within the formal language, the design techniques and parameters to create an architecture using the same software, but avoiding the free shape forming that makes the blobs. Opposed to the negative connotations of the blob, a new architecture based on movement and fluidity is still able to raise enthusiasm; whereas the blob space per definition is considered something bad, the fluid space is a good one.

background

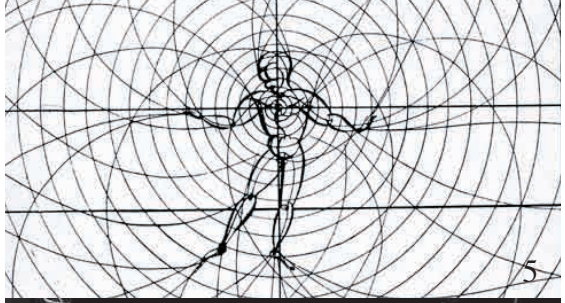
The idea of fluidity in architecture is not something new. As early as in the Baroque, experiments were done in creating new spatial systems by combining different defined geometrical shapes into new, less defined geometrical spaces that seemed, to a higher degree than ever experienced before, to flow into each other.

The idea of fluid organic shapes reached a new level with the invention of reinforced concrete structures at the beginning of the 20th century. The new technology made it possible to achieve an even more advanced architectural language, where the concrete – itself being fluid on the construction site – could make nearly every possible form. The advances in building technology coincided with a technological development of transportation devices resulting in an extreme belief and interest in speed and progress.

Artists and architects soon began to give shape to the idea of speed; investigating how new technology could help fulfil their dreams of a new, formal language. An early example is Mendelsohn's Einstein Turm (fig 2), where the architect's studies of the new physics, movement and mass reduction were important design factors resulting in a building with a formal language never seen before.

In the art scene, the most radical group were the Italy based futurists – presenting paintings and sculptures that aimed at showing the dynamism of mechanical speed. Their representations of movement (fig 3) did not resemble the shapes used by architects, but rather as staccato, intersecting lines, dynamic compositions and superpositioned images of movements. There was in other words not any fixed image of how speed might look.

Architects continued to take advantage of the reinforced concrete structures possibilities in creating free shapes, but the organic shapes soon became an answer to other ideas than the mere concept of speed, travel and movements. Even if the organic shapes of the concrete roofs in Eero Saarinen's TWA Terminal (fig 4) are still standing as the symbol of the dynamics of airplanes, the curved lines and the reference to "organic" forms turned into an architecture referring to man's relationship to nature.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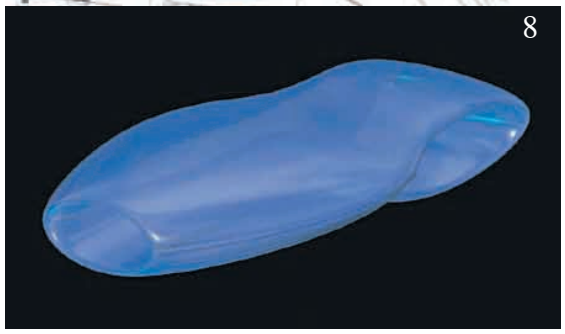
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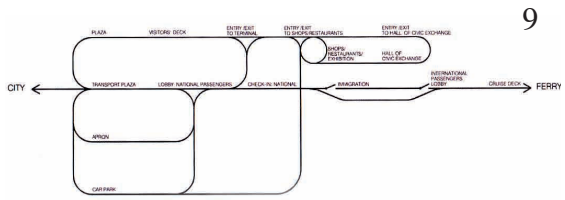

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Starting in Bauhaus with Oscar Schlemmer's account on artificial spaces and man's natural movements (fig 5), this approach was further stressed by the works of architects such as Alvar Aalto and Oscar Niemeyer (fig 6).

"It's not the right angle that attracts me, nor the hard inflexible straight line created by man. It's the free and sensual curve that seduced me; the curves I can see in the mountains of my country, in the sinuous curves of its rivers. On the sea waves. On the body of a favourite woman. The universe is all made of curves."[1]

Niemeyer's comment is interesting because he points at two issues that at once are very similar, and at the same time very different. His associations to nature and the concept of the natural goes for both the mountains, the rivers as well as his favourite woman. The fact that the right angle is not to found in nature has inspired many architects to design buildings that supposedly literally have grown out of their surroundings. What goes for rivers and sea waves however, are also closely related to the ideas of movement, dynamism, flow and changes over time.

diagrams

Technical advances has not only made it possible to extend the formal vocabulary to even more daring shapes and structural systems, it has also become a tool for mapping and overlaying more information than ever before. One office that has been working extensively with such overlapping systems of information is UN Studio. In their project for Arnheim Centraal, the design process involved solutions for six different, overlapping transportation systems – as well as "scenarios, diagrams, parameters, formulas and themes, encompassing the mapping of political, managerial, planning, community and private relations"[2]. Starting with relatively simple and straightforward movement diagrams for each of these systems (fig 7), new computer techniques were used to merge this into a three dimensional diagram, the so-called 'Klein Bottle diagram' (fig 8), where surfaces are transformed into a whole. By their use of graphics, both the two dimensional diagrams, the three dimensional diagrams as well as early schematic renderings – they closely knit the different design stages together. Even if the Klein Bottle diagram seems much more abstract than simple movement diagrams, there is an unmistakeable resemblance in the graphic representations of them in shape and colour.

It comes as no surprise that flow patterns are studied extensively in buildings for public transport such as stations and terminals. Foreign Office Architects mentions studies of movement patterns as essential to their initial design of their ferry terminal in Yokohama[3]. The principal diagram of urban flows affecting the building design (fig 9), even used as cover illustration of the book documenting the process of the project, is far more schematic and abstract than the ones used in the Arnheim Centraal project, and gives

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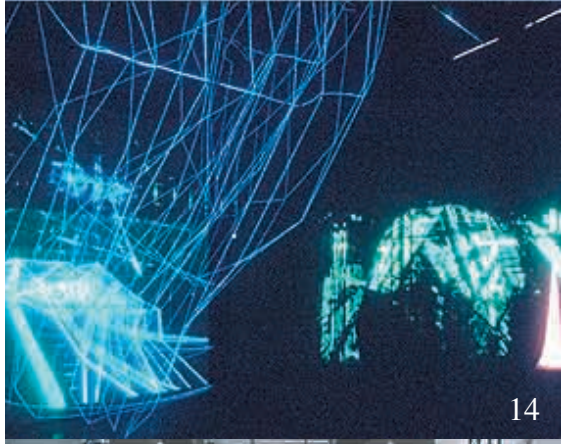
hardly any indication for what the final design might look like. Still, after project views are seen together with the original diagram the architectural connection seems vague.

Movement flows are not only considered in terminal buildings, but are also object to discussion in huge urban public developments. In Zaha Hadid's project for the Center for Contemporary Arts in Rome (fig 10) the architects refer to the urban geometry as the starting point for the design, a geometry they "flood (…) with streams of parallel walls". The project's organization is based on "directional drifts", its character that of "inferred mass subverted by vectors of circulation"[4]. In the architect's description they are constantly referring to natural phenomena such as floods, streams and drifts, and connect them with discussions of circulation. The existing and desired circulation affecting the project is not mapped diagrammatically as the case with Arnheim Centraal and the Yokohama terminal. Instead Hadid uses a set of almost monochrome conceptual paintings, that in one way can be interpreted as rather dry, showing what eventually will become the structural system of the project – or in a more imaginative way, showing existing urban patterns, new patterns created by the project, building, construction and its inhabitants using the building simultaneously. This interpretation is possible because she, even if the paintings employ a level of abstraction and means of representation (few colours, simplified lines etc) as many architectural diagrams, hides behind the words "conceptual" and "painting"; words that in themselves distance themselves from dry facts investigated and mapped on site, allowing for a intuitional approach to the design task.

new typologies

Similarities between the diagrams and the conceptual paintings are especially evident when comparing the architects' intentions. Ben van Berkel of UN Studio says that "the diagram functions for us as a sort of mediator. We see it as an external element, in between the object and the subject, that we use to introduce other themes and organizations into a project with the aim of escaping from pre-existing typologies"[5], while Patrik Schumacher of Zaha Hadid Architects state that "abstraction implies the avoidance of familiar, ready-made typologies" and continues to talk about the "liberating spirit of abstraction"[6]. They both see abstraction as crucial in the process of developing new typologies, and even if the interests as well as the goal of the completed design of both offices are indeed similar the development of the diagram itself is based on completely different techniques. While UN Studio claims, similar to a row of Dutch practises such as MVRDV, to almost let the facts design the building for them, Hadid relies on her architectural instinct and lets her general interest for natural systems lead the design. Still, it is striking how short the way from either "Klein Bottle diagram" or "conceptual painting" is to the finished scheme (fig 11-12).

Studying the behaviour of big crowds, after a finished football game, in a demonstration or simply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waiting to cross the famous Shibuya crossing in Tokyo (fig 13) – the idea of people generating, or acting like flows and streams does not seem farfetched. Still, the huge number of people using public spaces and buildings was not Schlemmer's main interest when drawing the diagrams of the natural space opposed to the artificial.

down in scale

New technological opportunities have brought new life into this individual aspect as well. As UN Studio superimposed different layers of material and crowd's flows to generate a three dimensional form, the American office Asymptote used a similar strategy in one of their installations for the US Pavilion at the Venice Biennale in 2000 (fig 14-15), this time on a micro level. By filming a gymnast's movement through space, they used digital modelling programs to create an abstracted movie, and eventually a life size sculpture (fig 15). The sculpture was a result of one person's movement through space; the physical form directly transcribed an action that never can be repeated in the exact same way. The idea that the audience, while observing the tunnel that came out of the original movement, will experience any of the gymnasts' movement seems unclear without backup of the movie; the installation then ends up going in circles – understanding of the work is dependent on the movie that generated it and vice versa.

If architecture is frozen music, then what decides the actual timing of the freezing? When a work is transferred from moving images of a movie, or morphing processes of computerized design, how do you choose the parameters for stopping the process and decide to construct the forms? The creation of a solid "dynamic" framework does not necessarily involve the audience, but might rather limit explorations of space. The question could then be if the result ended up like it did because of technological limitations hindering the architects to fulfil their dreams of an actual flowing space, or if their installation really is seen as a satisfying answer to their fascination.

The same question comes to mind when looking to Zaha Hadid's interior design for the Hotel Puerta America, recently finished in Madrid (fig 16-18). Taking full advantage of new techniques for both design and execution, the interior is made of LEG Hi-Mac, a new material made of acrylic and artificial stone that form seamless curved lines only seen in film sets and the like before. In describing the project, Hadid mentions the desire to create "fluid spaces"[7] as the main goal of the project, while the project architect claims the project being a dream for many years, now with help from advanced production techniques as well as new materials, finally come true[8]. The office's obvious and clearly outspoken interest for natural flows, including those of lava and glaciers, can be realised in the micro scale as well, but the paradox, like with Asymptote's installation, is that the fluid shapes desired are created with a stone like material that will never be able to change like a stream of lava or a melting glacier. In describing another interior the office did for an exhibition at MAK in Vienna, they say that "via this


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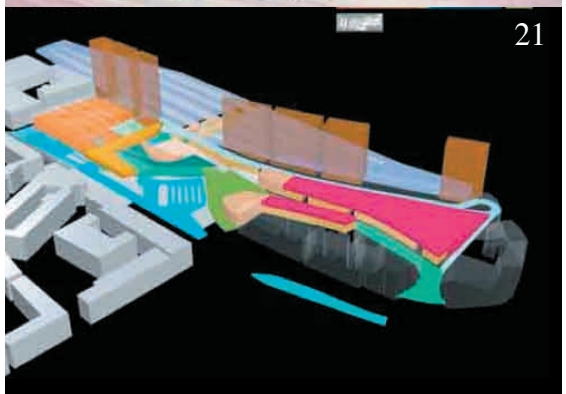
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morphing operation, the pre-existing furniture pieces are embedded within the overall fluid mass of the ensemble and become integrated organs of the overall organism (…) The installation asks the visitors to occupy the structure and to explore for themselves this new, open aesthetic, which invites us to reinvent ourselves in term of posture, demeanour and life-style"[9]. They zoom in from the scale of urban patterns to a coach; still their vocabulary – both in writing and designing - remains the same. The flow of people in a city or within a public building is seen as formally the same as the one found in a lounge, a lobby or even in a private hotel room. When arguing that 'circulation vectors' are responsible for a formal language in the Center for Contemporary Arts in Rome, what factors should imply a need for fluid spaces in a room used mostly when you move the least during the day, asleep? To share the dreams of the architects of a fluid formal language of possibilities?

More powerful computers than ever before opens up a world of shapes, systems of construction and application of materials that so far have not been available. The new complex geometries that were impossible only few years ago have revitalized an interest in flows, movements and fluid systems. Like a high speed train recovering after the fin-de-siecle moods both in the beginning of the 20th century (collapse of modernity), as well as the beginning of the 21st century (collapse of the computerized world) – speed, movements and flow are the optimistic terms towards the future – either as trains, cars and armours for the futurists – or as bytes per second, morphing programs and the information highway architects are cruising today.

Even if this renewed interest in what occupied artists and architects in the 1910's and 1920's has got one more palette to use – both to represent their ideas to the public, as well as transfer those representations to built form – they are still struggling with the same questions, and they are still struggling with finding the physical answers. "Movement implies geometry, and geometry then implicates form"[10] says Hani Rashid of Asymptote, but is that really so – and how important are the different types of movement? Executed with the most advanced technology at the time and with a precision and accuracy unseen before does their installation for the US Pavilion (fig 19) say anything more or anything more relevant about speed, dynamics and movement than Carro Balla's picture "Dynamism of a dog on a Leash" (fig 20) painted almost one hundred years ago?

In the excitement of all the new software available, many architects seem to uncritically embrace both a language and means of representation that, for some projects seems justified, in others just as manner, pastiche and questions of formal preferences. Does it make sense to speak about the flow of the individual, and if so; does this give the same formal answer as in a station building used by thousands? Even in stations like the Arnheim Centraal, Ben Van Berkel of UN Studio confesses that they "are beginning to realize that obstacles to flow can be functional and add value"[11]. These are new words in an

architectural scene where flow and fluidity is the functional, programmatic and formal answer in projects ranging from terminal buildings to hotel rooms and art installations. Could be he is right then, the Norwegian urbanist Erling Dokk Holm, when he claims that “one of the biggest problems in modern city planning is that we try to reduce the friction, so that people no longer meet – unless there is an accident and you meet in the collision.”[12]

notes

1: Andreas, P (ed): Oscar Niemeyer
2: Thakara, John: 'Deep Planning', from Domus 852 October 2002
3: Sakamoto, Tomoki (ed): The Yokohama Project
4: Schumacher, Patrik: 'Digital Hadid', p 33-34
5: Thakara, John: 'Deep Planning', from Domus 852 October 2002
6: Schumacher, Patrik: 'Digital Hadid', p 27-28
7: From the official website of 'Hotel Puerta America'
8: From a video of Woody Yao, Zaha Hadid Ltd., on the official website of 'Hotel Puerta America'
9: Schumacher, Patrik: 'Digital Hadid', p 55
10: Asymptote: 'Flux', p 60
11: Thakara, John: 'Deep Planning', from Domus 852 October 2002
12: Ødegården, Olav: 'Velparfymert sosial snøbrøyting', Arkitektnytt 17/05, p 10 (my translation)

literature

Andreas, P. (ed): Oscar Niemeyer
Published by Birkhäuser, 2003

Asymptote: 'Flux'
Published by Phaidon, 2004

Noever, Peter (ed): 'Zaha Hadid - Architektur'
Published by MAK (Wien)/Hatje Cantz Verlag, 2003

Sakamoto, Tomoki (ed): The Yokohama Project
Published by Actar, 2003

Schumacher, Patrik: 'Digital Hadid - Landscapes in motion'
Published by Birkhäuser, 2004

ARCH'IT Files
Molinari, Luca: Interview with Hani Rashid (first published in Vanity Fair, Italy)
http://architettura.supereva.com/files/20040913/

Arkitektnytt no 17 2005
Ødegården, Olav: 'Velparfymert sosial snøbrøyting'
Published by NAL, 2005

Domus no 852, October 2002
Thakara, John: 'Deep Planning'
http://www.edidomus.it/Domus/magazine/edicola_articolo.cfm?codice=15787&lingua=_eng

Metrolpolismag
Hall, Peter: The Rashid Machine – Interview with Hani and Karim Rashid
http://www.metropolismag.com/html/content_0201/ras.htm

Observer 31.06.2005
Rattray, Fiona: 'Suite on You'
http://shopping.guardian.co.uk/travel/story/0,1586,1538092,00.html

Asymptote Architects
http://www.asymptote-architecture.com

Hotel Puerta America
http://www.hotelpuertamerica.com/

UN Studio
http://www.unstudio.com