#1

Parasitic Architecture

introduction

The notion of parasitic architecture is often associated with German architect O.M. Ungers. According to Ungers parasitic architecture is a fill in of the Grossformen of the city. In his article "Grossformen im Wohnungsbau" he explains this theme: "Warum Grossform?... Die Antwort: Die Grossform schafft den Rahmen die Ordnung und den geplanten Raum fur einen unvorhersehbaren, nicht planbaren, lebenden Prozess, fur eine parasitäre Architektur. Ohne diese Komponente bleibt jede Planung Starr und leblos." [1]
According to Ungers a Grossform is a coherent frame larger than the individual parts it comprises. It is the bedrock of a dynamic society. Parasitic architecture is the personal, informal and unplanned use of a larger structure. However, as mentioned by Ungers himself, the Grossform without individual adaptation is deadalive. Formal architecture and the unpredictable adaptation cannot live without each other. In fact, their coexistence is a mutualism rather than parasitic relation. A Google search for the term 'parasitic architecture' gives a wide array of contemporary associations connected to it. This 'parasite paradise' consists of a whole of reuse of and addition to existing constructions. These parasites literally live on the energy that was collected in these buildings over the years. But they do no more than that: they have no social meaning nor do they use their parasitic character to transform urban systems.Besides this, there are the so-called 'design parasites' with their scale between street furniture and buildings. They are able of landing in many places, without actually critically approaching these locations. Their mobile nature gives them a lack of engagement. Their surprising appearance is not matched by an equally interesting opinion on urban or architectural themes.
In our opinion, the qualities of parasitic architecture can be employed to serve a greater good. The parasite has the capacity to transfer energy for one system to another, new system.
Parasitic architecture can be less superficial and more meaningful by doing so.

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Parasitic architecture

terminology

Origin of the term

The parasite used to be someone who eats next to someone – was a well known figure in the ancient Greek society. At first, it was used to describe the priests involved with the sacrifices. Later, it referred to guests invited to diners to entertain their host in exchange for food. Only later did parasites get their negative image of spongers. This negative association is still recognizable in the biological definition of parasitism as a symbiosis or coexistence in which the parasite has an advantage at the expense of its host. Gain and damage in this are expressed as influences on the success of the species. The parasite is selfish since it does not return its host's favor; it is parasitic for its own well being and gives its species an advantage in the long run.

The parasite has to understand the working of its host and exploit this knowledge in order to survive. Such a relation between parasite and host, in which the former takes advantage over the latter, is also imaginable in architecture. However, this cannot lead to the destruction of the host, since this would also mean the end of the parasite. In biology, a relation in which an organism kills its host is defined as parasitoide. This is impossible in architecture, since its consequence is destruction instead of creation. The analogy between biological and architectural parasites is limited though: Architecture is creative, it will always produce something and can therefore not just merely be at the expense of a host. Architecture's intentions are sympathetical for its users. The question about parasite and host remains: what is the host for this parasitic entity of architecture and user? The biological host is, both literally and metaphorically, the carrier of the parasite. Comparable carriers exist in architecture too, namely the systems of the city.

The host

In *The Storm and the Fall* Lebbeus Woods describes how architecture traditionally has had a reassuring role: "The unity and symmetry of monumental architecture refers symbolically to a harmonious and balanced universe in which contending forces are reconciled. The traditional role of architecture has been one of reassuring us that things are under control, that is, stable and static. But it is quite another thing to think of all architecture 'in tension'."[2] Architecture is stable and static to give the impression that things are under control. The continually developing society, however, is obstructed by the inertness of the existing systems. They cannot be an up-to-date expression of the condition of society, simply because these systems always lag behind. The rupture between the systems that are present and the ones desired by society does make a fertile breeding ground for our parasite.

The urban systems mentioned before can be distinguished into physical and mental systems. The physical systems are infrastructure, built environment, etc. Mental systems comprise among others the expectations that exist in society. Juridical regulations and policy notes are part of this, as are the unwritten rules of a society. These systems create a whole of different layers that make it possible for them to coexist, amalgamate or interfere. Social and cultural changes are expressed in uncertain territories, many physical and mental boundaries and unclear conditions making it possible for temporary phenomena and processes to come into existence. Parasitic architecture can be employed to facilitate these temporary phenomena and processes within the existing urban context by making the systems more flexible and more porous.

The mediator

Parasitic architecture can be employed as a mediator between the changes in society on the one side and the urban systems on the other. The parasite is informal compared to its host. Therefore, the parasite can be used to stimulate and accommodate spontaneous processes and informal initiatives. This is achieved because the parasite provokes, explores and breaks open both physical and mental boundaries in order to offer opportunities for the elusive and new propositions.

In this way parasitic architecture can start a process of changes. The parasite functions as a medium used by a group of people to negotiate with existing systems and to propose certain changes of these systems. So, the parasite is a political means. BLDGBLOG: "It's the idea that a building – a work of architecture – could directly catalyze a transformation, so that the society that finishes building something is not the same society that set out to build it in the first place. The building changes them." [3]

The process of changes does not necessarily have to be actually executed: As a negotiator between different groups the parasite is an experiment to investigate the amount of support for proposed changes. It is a clear sign or symbol of a desire, of an urban problem, of a hidden possibility existent in society. The parasite provokes both opposition and support for its proposal. To overcome indifference is a goal in itself.

Immune System

By applying a parasite, changes in society can be embedded in the slow, permanent systems, because parasitic architecture is fast, temporary and dynamic. When the parasite is embedded the immune system of city comes into action, because the parasite always is a provocation against what already exists. Just like architecture, which is passive ands needs people to represent it, the city also needs people to defend it. The parasite activates the battle between the people who support the transformation (thus the parasite) and the people who want to maintain the city as it is. They are the ones who are provoked by the parasite.

The immune system has two categories:

The random immune system:

The primitive defense system of the city against everything that is out of the ordinary. Like phagocytes, the vandals ravage through the city trashing phone boots, car mirrors and Eindhoven's smallest apartment. The removal happens fast en unnoticed, but is – speaking in terms of parasitic architecture – meaningless: this can only occur if the support for the parasite is temporarily absent. Another example appears from one of the rules of the street game "Urban Warfare": "In most cities there are game-officials in the streets (paid by local governments) removing soldiers hat are place too visible. It is the art of placement and camouflage in the urban surrounding." 4 Since this kind of immune system is random, removal of the parasite often is more a coincidence then a sign of rebellion.

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The immune system as a reaction to provocation:
The second kind of immune system is specifically targeted at the detected parasite. Therefore it can be seen as a reaction against the transformation of the existing urban systems, as proposed by the parasite. The scale of this reaction can vary from individual (in the case of affecting personal boundaries) to a mass reaction (when there are major objections against the transformation or when a group feels violated in its privacy).
There are a number of strategies to prevent the immune system to come into action. Firstly, the parasite could use the technique of deception. A camouflaged parasite could blend in with the existing urban systems, so it can not be recognized as new or different. It could use the appearance of the existing urban systems but function entirely different. The parasite then is invisible for the masses, only the explorer can recognize the provocation. This small group of persons often consists of experts of the situation, they are directly involved with the border that is crossed by the parasite. The parasite can be much more effective because the provoked can immediately see the context of parasite.
Another form of the deception technique uses a suppressed immune system to survive. When the opportunistic infection strikes, the parasite only is accepted because the immune system is fighting other (worse) diseases. In the urban environment this means that the reaction of the immune system in "delicate" areas of the city will not be very strong. A parasite at a former harbor area could feel as an improvement of the situation.
Secondly, the parasite could use the technique of inviolability. By positioning itself out of reach of the immune system it can escape from it. This can be highly frustrating, because the provocation cannot be followed by demolition or destruction of the parasite. This inviolability can be designed. It can be extremely solid or be situated at an unreachable place, or more practical, it could have a physical protection like fencing.

Lebbeus Woods: Havana re-imagined

Inviolability can also be understood more metaphorically: An urban dictator has the authority to propose changes in the urban systems and to execute those even if they are not supported by the population. The modification, however, is defended by the authority (in effect police, army) preventing the natural reaction of the immune system and making sure it cannot be removed.
This dictator is also present in the bureaucratic legislation. These rules do result from democratic decisions, but they always are a tying up of sentiments in society at a certain moment in time. By examination a priori and a posteriori legislation defends the exact existing built structures the parasite wants to change.
The built parasite has already broken its first barrier: the red tape of formalized consultation and compromising is being ignored. This inertia cannot be combined with the parasite's swift action. But, as soon as the parasite has a physical presence it can use the legislation in its advantage: By truly understanding this, the parasite can make sure to fall within the protection of the same legislation. The legislation – an opponent at first – changed for the better and now serves as a reversed immune system protecting the parasite against its opponents.
Thirdly, the parasite has the possibility of looking for support against the immune system by campaigning: by reacting to an imagination the parasitic operation obtains sympathy from groups in society that collaborate against the conservatives. The parasite's survival and tradition are depended of the strength of its protecting group. It is essential to address a clearly defined target group to maximize its effect.

Course of life

Life and death of the parasite are depending on the force of the immune system and of the support for the proposed changes. It will disappear if there is too much provocation, if there is too much resistance against the parasite. Apparently, there is not enough energy in the rupture between social and physical systems to change the situation.
If, however, the parasite does a proposal that is widely supported by the society it will in fact change the physical systems of the city. The parasite brings society and urban structures closer. The definition of parasitic architecture expires in this case: A new structure comes into being. The architecture has become an expression of a social demand or subculture. A mental desire has been transformed into a tactile structure; the paradigmatic parasite will act as an example for the city.
Between these to extremities there are several forms of partial acceptation and partial rejection. A direct action of the immune system does not have to mean the end of the parasite's functioning. It can disappear physically, but survive symbolically: the parasite as a martyr. The awakening created by the parasite can be sufficient to initiate changes in the city.
As a form the parasite can become incorporated, tolerated and encapsulated. The immune system does not have a reason to destruct the parasite, since the threat it poses is small or not yet fully understood. It might seem unlikely that the proposed change will actually take place. The parasite remains an incident, because support for large scale changes is lacking or because the parasite proposes an impossibility.
The parasite's course of life is no indication of its success. But the change (both small-scale and large-scale) of the physical or mental systems it causes surely is. Without mental changes (read: awareness) of the urban systems or transformation of the physical urban structures the parasite turns out to be a misconception.
Apparently, there was no breeding ground for the parasite.

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Conclusion

The preceding text has explained our idea of parasitic architecture as a means of proposing transformations in the city. With this, we have excluded the 'design parasite' mentioned in the introduction from our definition of parasitic architecture. This also applies to Ungers' vision of the parasitic in architecture and urbanism, for Ungers sees this parasitic as an enlivenment of his Grossform: He plans the unplannable and he expects the users of the Grossform to be parasitic to the form he invented.

Our point of reference is the existing situation in which a certain desire, criticism or problem has to be dealt with in order to come to a transformation of that situation. These things are by no means generic; the society's dynamics are expressed by group or individual initiatives. It becomes an expression of the pluralism of our society. This same pluralism will always cause resistance from the initiative's opponents. They are the city's immune system.

We have described several ways of dealing with this immune system. There are possibilities of deliberate confrontation or deliberate dodging: With the former, the point is to find as many supporters as possible to overcome the immune system. The latter deals with minimizing the opposition or with the prevention of the materialization of this opposition.

The importance of the parasite is to be found in the residue of its aspirations. This can be a physical transformation of the urban systems and will cause the city to better fit the needs of the capricious society. Another residue is the awareness with users of the parasite. This is not about a physical, but a mental transformation of the urban systems.

According to us, the parasite is a political means to offer or propose a transformation that currently has no place in the existing systems. It is able to react swiftly do changes in our society. The current process (the bureaucracy) is incapable of admitting these changes. Therefore, parasitic architecture always has a illegal element to it. It withdraws itself from the existing system of legislation. It is looking for the boundaries between possibilities and admissibilities. Parasitic architecture is thus an effective means for the architect to create the rapidly changing desires of society into urban shapes.

Notes

1. Lara Schrijver, The archipelago city: piecing together collectivities; Oase 71, 2006, Nai Uitgevers, Rotterdam

2. Lebbeus Woods, The Storm and the Fall; 2004, Princeton Architectural Press, New York

3. Geoff Manaugh,"Without Walls: interview with Lebbeus; 2007, http://bldgblog.blogspot.com/2007/10/without-walls-interview-with-lebbeus.html

4. http://members.chello.nl/j.jongeleen/guidelines.html

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Biological Analogies

Designed by mother nature

Introduction

Obviously, parasitic architecture has a reference to parasitism as it occurs in nature. This biological parasitism has many variations and the parasite often has ingenious solutions to benefit of its host. The phenomenon is known for thousands of years, but there was no technology to study the often extremely small organisms. For instance in the Renaissance it was believed that parasites were a product of the body itself. A massive tapeworm was considered to be an independently functioning organism, but nobody had ever seen this worm crawling into somebody's mouth, so it had to be produced by the body. A change to that came when Antonie van Leeuwenhoek invented the microscope. This allowed biologists to study the tiny parasitic organisms which for example, could evolve into a tapeworm.

Symbiosis

Symbiosis means that two organisms live closely together. Parasitism is a version of symbiosis. "Two organisms which are phylogenetically unrelated co-exist over a prolonged period of time, usually the lifetime of one of the individuals," as Wikipedia clearly states. The host and parasite live together, but only the parasite benefits while the host is harmed. The parasite uses its host to comply with its needs of survival and reproduction. But it also understands its host; it knows how to use it to its full potential without killing it. Cymothoa exigua (shown on the left) replaces the tongue of a fish by eating it and positioning itself in that place. It even helps the fish to retrieve food for itself but also for its host.
Another form of symbiosis is commensalism. This means that two organisms live in the same space, one of them benefits while the other has no harm or profit from this relation. A bird that lives in a hole of a tree is an example.
Mutualism is a more positive form of symbiosis. Both organisms benefit from their relation. One organism is usually smaller than the other. A good example of this is the Egyptian Plover, this bird helps a crocodile keeping parasites of its body, while retrieving food for itself. Many forms of parasitic architecture are a form of mutualistic architecture. The "parasite" in architecture is usually deployed to meet mutual benefits.

Case study: the parasitoid

A parasitoid is a more destructive version of a parasite and is the opposite of mutualistic interaction. It is defined as a parasite that ultimately kills its host. In architecture this is not a very appealing scenario in most cases, but it is a very interesting one to study a bit further nonetheless.

Upper left: *the Egyptian plover*
Upper right: *the Ichneumonidae*
Below: *Cordyceps unilateralis*

A well known example of a parasitoid is the Ichneumonidae. These wasps parasite on butterflies, beetles, caterpillars and even other ichneumon wasps. When the Ichneumonidae finds a suitable host it places its eggs in it. There the eggs will hatch and the resulting larva will devour its host from the inside, before it finally emerges from it. The host is no more, as Stephen Jay Could describes, then a "food factory". Since a dead host will degenerate fast, the larva will consume the non-vital tissue first. Right before emerging parts like the heart and the brain are finally eaten.
Another example is the Cordyceps. When a host (mainly insects and especially caterpillars) is infected, the fungi will enter the inner parts of it body and multiply itself. The Cordyceps will grow from there. Soft tissue will be absorbed, but again, vital tissue will be spared at first. When the fungi has developed enough it can reproduce itself by spreading its mycelium. To do this it literally takes control of its host and makes it commit suicide.
The Cordyceps unilateralis, that parasites on a specific species of ants is capable of producing a protein which manipulates the ant's brain and nervous system to stimulate it to climb to the top of a tree. The manipulated ant will climb higher and higher and will eventually attach itself to a tree by biting in it. When that happens the fungi will kill its host and uses it as a source of nutrition to spread its mycelium.
Another parasitoid, the Taxoplasma gandii uses Felidae (the biological family of cats) to reproduce. At first it parasites on mice and rats and manipulates them to take more risk. This increases the changes for them to be eaten by a Felidae. Similar parasitoids can be found in shrimps, that start searching for predatory fish instead of avoiding them.
These parasitoid eventually result in the death of the host, while the benefiting organism lives on. So it is a transformation where the existing is destroyed: a revolution where the energy of the host passes into a new phase, leaving it residue liveless. When ap-

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The Sacculina

plied to architecture, these parasitoid strategies would lead to the destruction of the existing structure. Our proposal is not to create a completely new city, but to transform the existing urban systems instead. No tabula rasa but a correction, so the urban system fits the changes of society. This is continuing process, it will happen again and again since our society is dynamic. Parasitic architecture is an ongoing phenomenon that will keep negotiating with the existing systems, while parasitoid architecture will constantly have to start all over again instead.

Casestudy: the Sacculina

In parasitism there is a distinction between endoparasites, who live inside the body of their host, and ectoparasites, living on the outside of their host. Endoparasites are considered to be more devious, because there is no visual indication of their existence on the outside of the host. The parasite can be relatively harmless but also be very influential, even to the extend where it completely controls its host.

The Sacculina is an ingenious example of how a parasite is able to influence its host. It is specialized to parasite on crabs. The Sacculina knows exactly how to approach and treat the host.

The female Sacculina is a small larva; with an organ that is able to "smell" a potential host. When she lands on the crabs armour,

The Sacculina Crab

she will search for the joints of the crab's legs: this is a weak spot. There it will inject its soft body into the cavity, leaving its outer shell behind. This 'soft' Sacculina will travel inside the crab's body to the underside of the crab's rear thorax, where the crab's eggs would be incubated. There the Sacculina will grow and evolve into a sac. It grows small 'roots', which extract food from the blood of the crab. An important fact is that even though the crab can live on like this, it does stop growing and reproducing. It is in the Sacculina's interest to leave the crab alive so it can provide food. The parasite keeps on growing 'roots' in its host body, until it is almost completely filled with it. All this time the crab is able to live on, unless a male larva finds it.

The male Sacculina also lands on the crabs outer shell, but he will

crawl along the body until it finds the sac at the rear of the crab. At the top of the sac, he will find a small hole, like the female he will inject himself into it. He will travel to the centre of the female body and merge with the female and start producing eggs. The female Sacculina can merge with two males, and will carry them throughout the rest of her life. From that time on it will not stop producing eggs, every few weeks she will deploy thousands of new Sacculina larva. The parasitized crab only lives to serve the Sacculina. The crab has no chance of defending (its immune system is no match for the parasite) ; it even thinks it is part of its body. The female and even the male crabs, protect the sac as if it were their own eggs. The crab will keep the sac clean and protect it against all treats. When the Sacculina is ready to release the larva the crab climbs onto a high rock where the current is strong, thereby helping to release dozens of new parasites into the water.

Conclusion

The Sacculina parasite is an example of how ingenious parasitism can be. It is more then just an attachment to the body of the host. It knows all its weaknesses and knows how to manipulate it to benefit from it. To make parasitic architecture work it is important to know the weak spots of the host (the urban systems). At what spot can the architectural parasite be most effective? The architectural parasite also wants to manipulate the host to serve its needs, but that is also the freightening part. Nobody likes to be controlled by an external force. So in architecture it is important to convince the users (of the urban systems) of the good intentions of the parasite. A parasite should explore and reveal new possibilities for the urban systems to function. When a group of people is convinced of the proposal of the parasite, they can start defending it - like the crab defends the parasite sac - and persuade other groups to join them until eventually the parasite is accepted as part of the new urban system.

Raoul Hausmann , the spirit of our time

/Karel Steller, Gerjan Streng