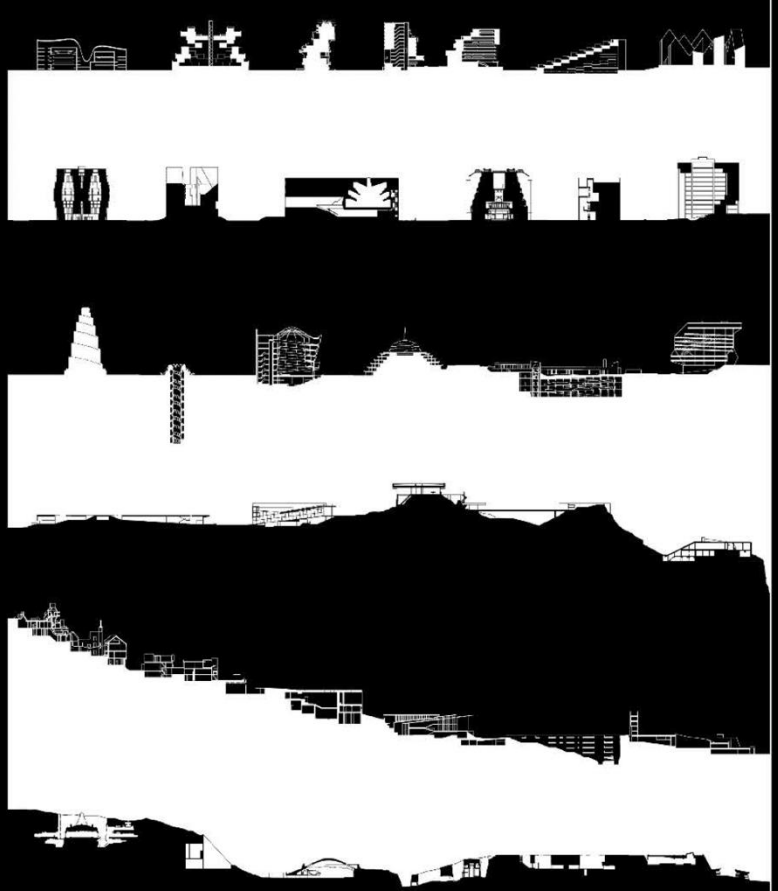
SeARCH

Bjarne Mastenbroek



Taschen

digitality

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building bound to the ground

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Taschen

Nature's Lack of Design

An essay that traces the history of humanity to better understand the relationship between the built environment and the ground on which it sits. It includes a timeline of pivotal moments in which humankind constructed, embraced and retreated to its own environment over the last millennia.

Building Bound to the Ground

Six strategies for reconnecting architecture and landscape, merging building and ground.

Bury

The building sits below the earth's crust, allowing for an uninterrupted landscape above.

Embed

Building and landscape share an equal position within the earth's crust. The building is embedded in the landscape and the landscape is manipulated to accommodate the building.

Absorb

The building sits atop the earth's crust, receiving information from the land below. Externally, the building alters the landscape, but within the interior, landscape dictates.

Spiral

The spiral twists the ground upwards or downwards, multiplying the building's surface area without breaking it into discrete floors. The fluidity of movement and continuity of surface offer a way of unifying building, infrastructure and landscape.

Carve

Space is carved out of the centre of the building to form a new interior landscape. Natural elements of air and light are invited inside and enclosed.

Mimic

The building learns from the landscape. It mimics and simulates natural features and systems, terracing, branching and growing. Building and landscape have begun to merge.

When I look at a landscape I cannot help seeing all its defects…
If Nature had been comfortable, mankind would never have invented architecture."

Oscar Wilde

From cave to canopy

Ritualization of life

Domesticating Nature

Shelter to shed

From Shelter to Shed

The settling of the hunter-gatherer was a slow, uneven, fragmented process, and practices of foraging and farming coexisted within many early settlements.

Roughly three typologies are distinguished within these early settlements: shelter for people (houses), shelter for food (storage) and space for worship (temples). It is often presumed that these programmes were separated out. Art was concentrated in special ritual buildings, houses were laid out in zones, and human skulls were buried communally.[17] But in Çatalhöyük there was no marked separation of ritual and domestic functions.[18]

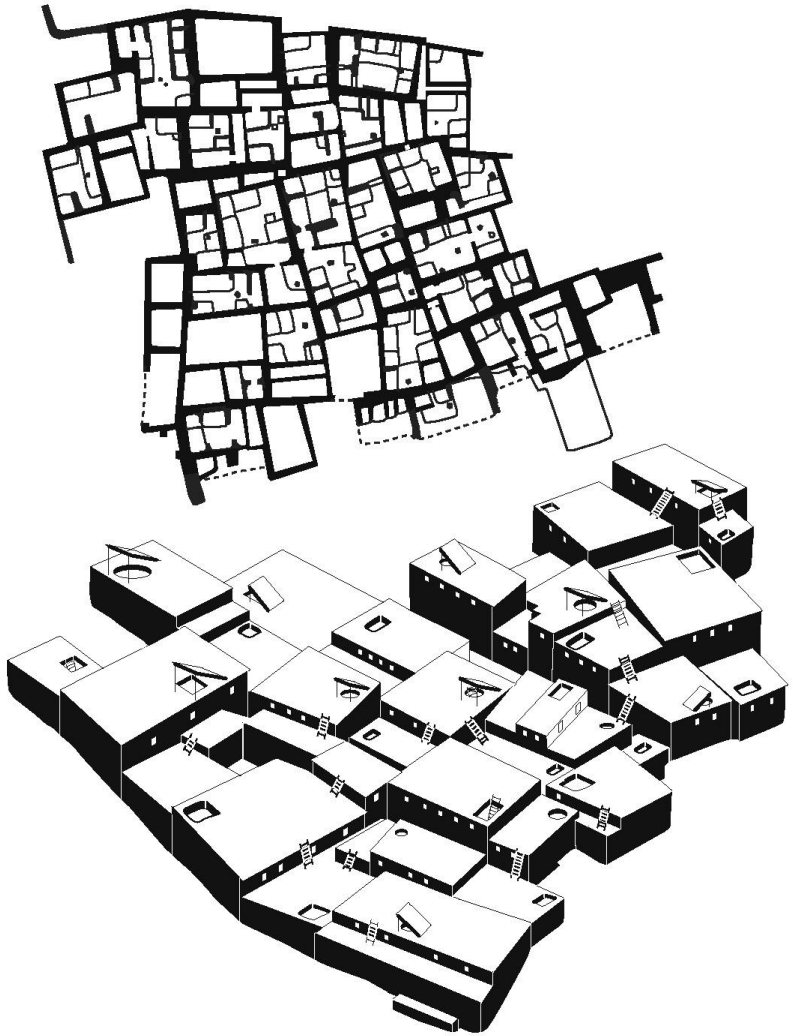
Quadrangular mud-brick houses (left) and storage for cereals (right), Mehrgarh, 6000–4000 BCE.

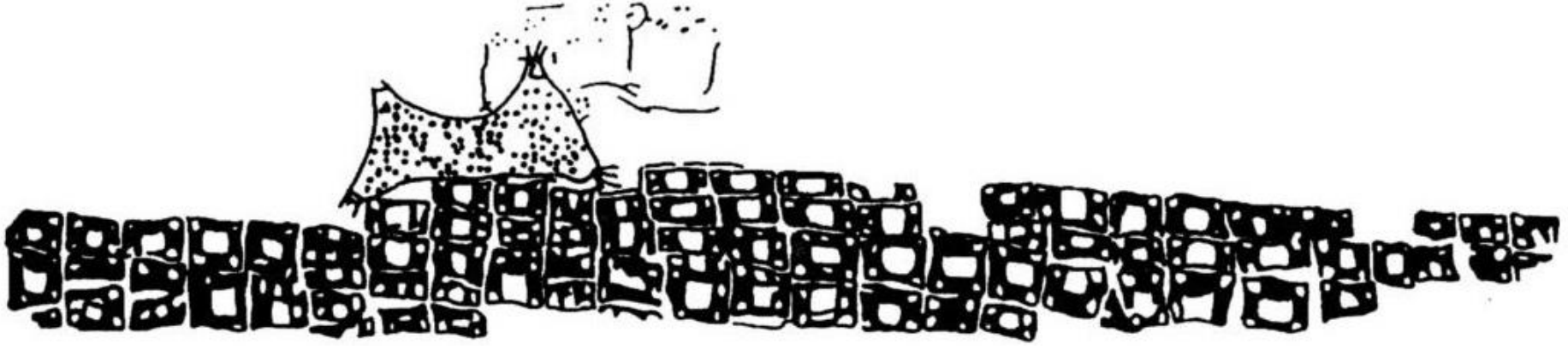
At Çatalhöyük, all dwellings are different in shape, size and level of decoration, yet most consist of a central room with raised platforms. These platforms had a double function: inhabitants slept above and buried their dead below. Subtle differences in material, height and colour described function, and space was remade and reworked for different purposes.

The larger urban form shared this fine-grained complexity. Dwellings were continuously built, levelled and rebuilt upon previous dwellings with an immediate and abundant material: earth. Çatalhöyük's built form was a topography. Dwellings were clustered together with mutually supporting walls; there were no gaps, passages or 'streets'. Instead, inhabitants traversed the honeycomb-like maze of Çatalhöyük's rooftops, accessing their homes through an opening in the ceiling.

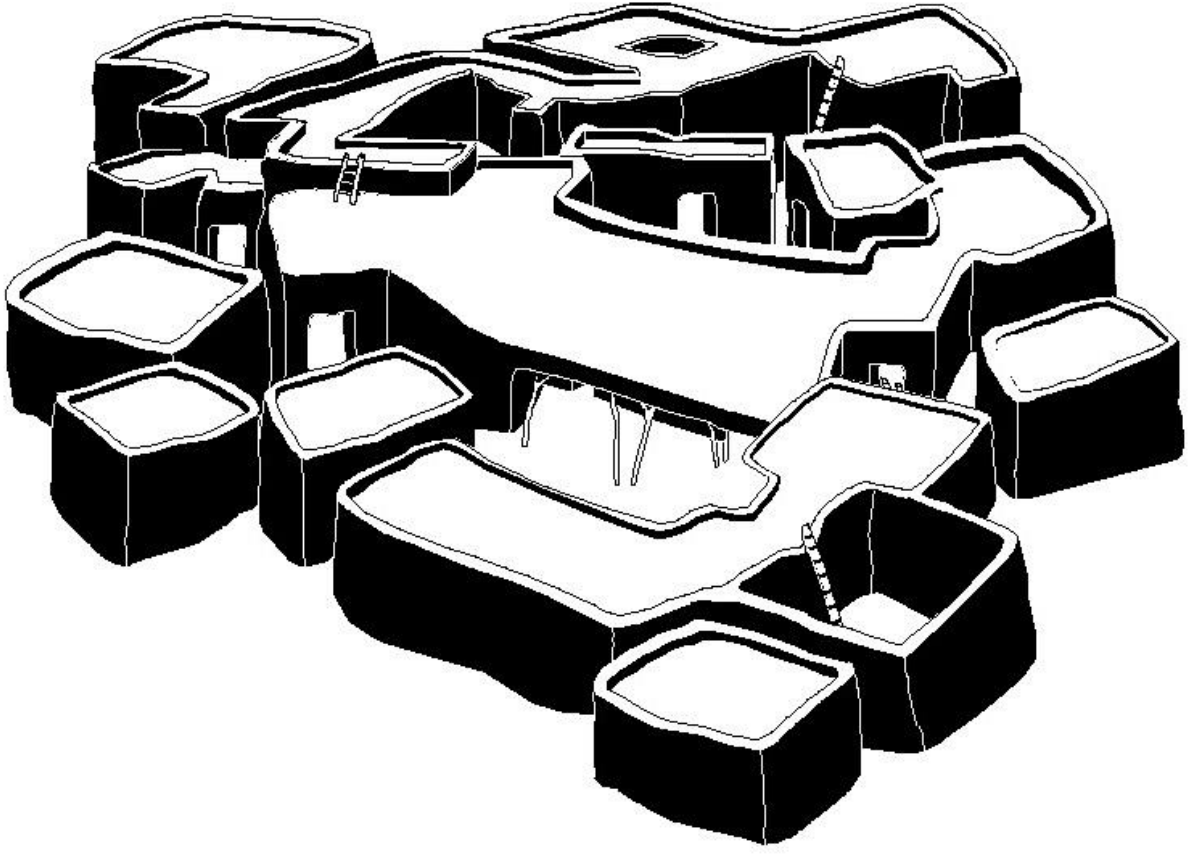
The efficiency of this urban form is evident. Every surface is maximized, while structure and material are kept to a minimum. Roofs are not purely elements of shelter but a space

The plan (top) and axonometry (bottom) shows how dwellings were clustered together, sharing walls and accessed from the roof. Çatalhöyük, 7400–5700 BCE.





Çatalhöyük, first known depiction of ‘urbanization’, discovered by James Mellaart in 1964

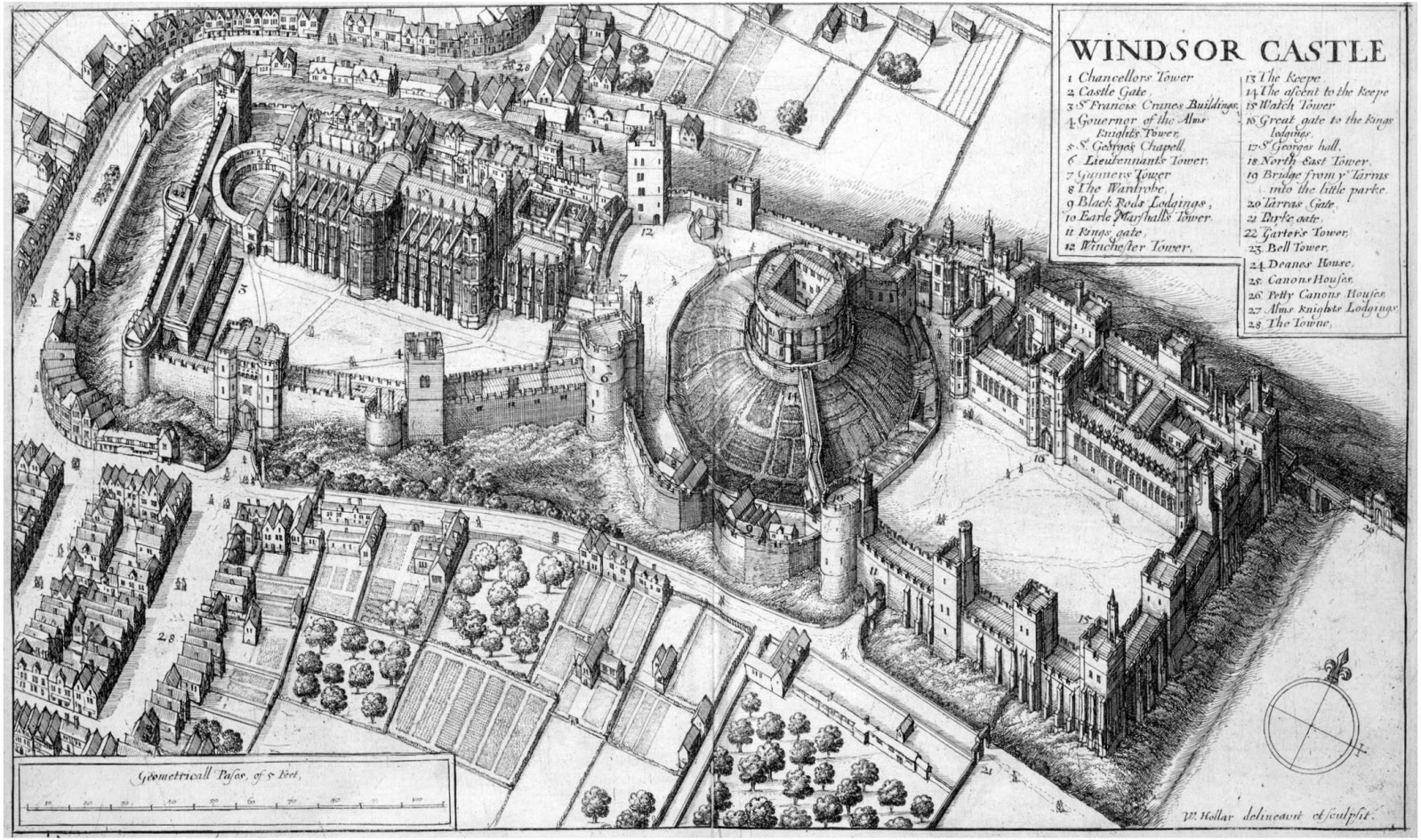


Secondary routing via the roof in northern Ghana

Compound to community

Middle age fortifications

Windsor Castle transformed into a stone fortress by 1272. This etching by Wenceslaus Hollar shows the impressive central motte, 1650.

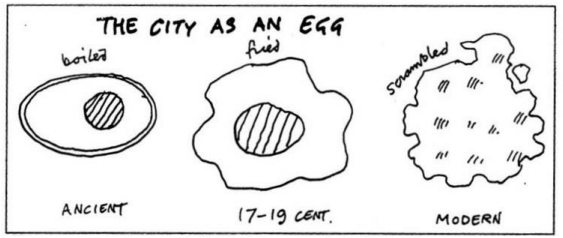


The city in the garden

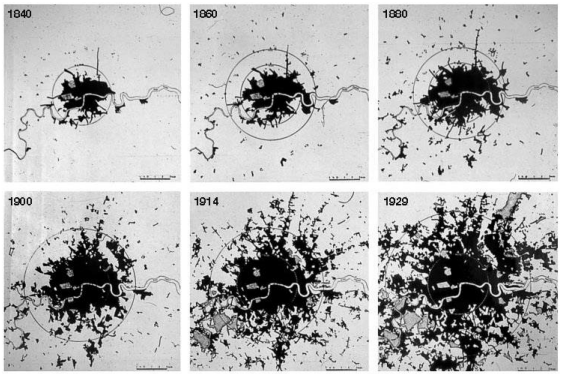
The Paintings (with Us in the Nature), Gilbert & George, 1972.

The City in the Garden

The twentieth century fundamentally altered the DNA of Western urban form. Summed up remarkably simply by Cedric Price, the compact ancient city encircled by defensive walls ballooned concentrically under the Industrial Revolution, only to finally choke and collapse in the twentieth century. The modern city abandoned a dense urban core in favour of a networked, mobile, decentralized urban realm.



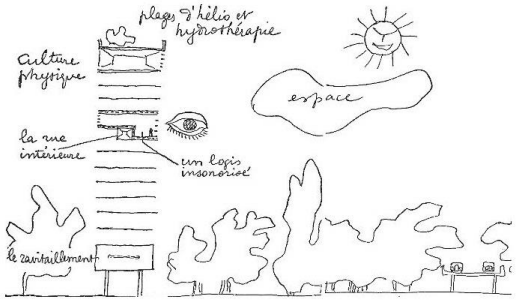
The City as an Egg, Cedric Price, 1962.



Urban sprawl of Greater London, Patrick Abercrombie, 1944.

In the eighteenth century, only three per cent of the world's population lived in cities. Spurred by industrialization, Europe and America rapidly urbanized. In this revolution's birthplace, Britain, the population virtually doubled every fifty years and the enormous wave of migration into cities resulted in

Modernism recognized the similar symptoms of the Industrial Revolution but sought a very different antidote to this 'urban disease'.[51] Highly idealistic, early modernists argued it was architecture's responsibility to revolutionize the city, clearing away the oppressively filthy and congested traditional city and creating a new space of order, light and freedom.



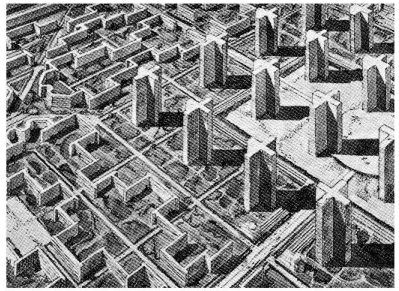
Modernist space was defined by air, light and freedom, Le Corbusier, 1936.

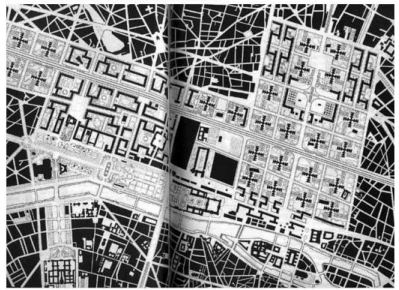
Le Corbusier sought to 'free the ground plane', raising towers on stilt-like columns, so that citizens might stroll through a park-like city without having to encounter anything as vulgar as the common street.[52] Standing on pilotis, the ideal modernist building would hover above the landscape, dominating the surroundings and literally detaching the living functions from the ground. Le Corbusier saw the ocean liner as a symbol of this new era, a feat of design and engineering that allowed humans to float in a self-contained city.

> "A city! It is the grip of man upon nature. It is a human operation directed against nature, a human organism both for protection and for work. It is a creation."[53] – Le Corbusier

For Le Corbusier, the formula for the modern city involved the marriage of humankind, nature and technology. Building upwards maximized density and open space. His Ville Contemporaine was envisioned as a new city of repetitive monolithic skyscrapers to house three million people, spread evenly across a vast green area. Here nature transforms the unhealthy chaotic and dense city into a place of peace and pure air.

In the twentieth century, nature became so clinical that the park was referred to as the 'lungs' of the city.[54] Urban nature was considered infrastructure, a green carpet to be built with the same intensity as water and sewage systems, highway networks and housing developments. Perhaps the modern movement sought a vertical garden city, but the strict order, symmetry and standardization of modern form offered little space for negotiation with its surroundings. Lewis Mumford notes that by mating the utilitarian and financial image of the skyscraper to a romantic image of the environment, Le Corbusier had in fact produced a sterile hybrid.[55]


Ville Contemporaine, Le Corbusier, 1922.

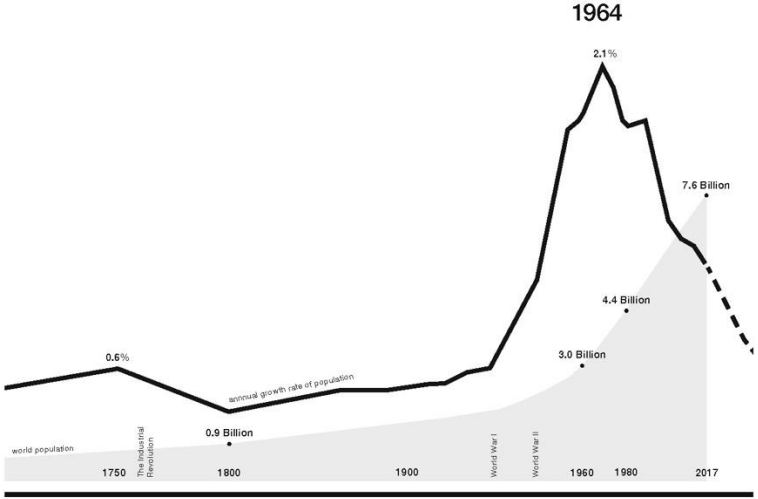

Le Corbusier's Plan Voisin proposed the erasure of the traditional urban fabric of Paris in favour of a grid of twentieth-century towers, 1925.

Both Le Corbusier and Jane Jacobs visited New York for the first time in 1935 and were equally excited. However, their reasons for this excitement could not be more different. Le Corbusier was thrilled about the wild brutality, the ***sauvagerie***, and looked at it as an experiment of a new order, probably his order.[56] Le Corbusier studied the 'hardware' of New York, seeing potential to improve the efficiency of its gridded high-rise form.

A pivotal moment

A first self-portrait of humankind: one of the historic first color photographs of the entire disc of Planet Erath, captured by ATS III on 18 November 1967

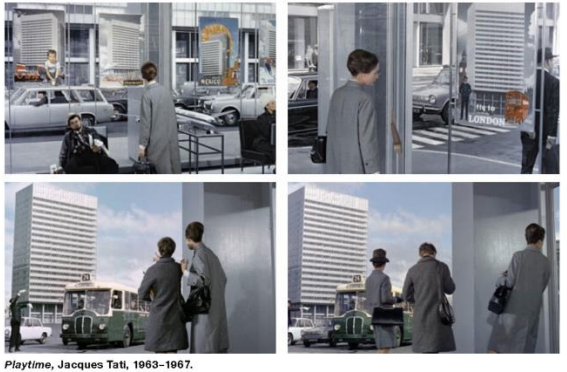
The year 1964 was a pivotal moment in history. Our global population growth rate hit its peak and has never been higher. Humans were racing to leave the earth and biologist Rachel Carson had just witnessed a *Silent Spring*, awaking one morning to find the birds had stopped singing.[1] With ever-quickening speed, humankind's relationship to the earth had shifted from symbiosis to commensalism to parasitism. We went from guest to stalker to thief and, in the end, to killer.



Growth rate of global population, Max Roser, *Our World in Data*, 2015.

Nature's silence represented the fading out of humankind. By poisoning nature, we were poisoning ourselves. Carson's words shook the myth of infinite growth to its core and challenged the doctrine of progress that saw humanity sprinting towards its own extinction.

As Western society confronted nature's frailty and the damaging role humans play at the centre of this narrative, the absurdity of modern urban life came into sharp focus. In his film *Playtime*, Jacques Tati held a mirror up to society and the austere and antiseptic city in which it was aspiring to live.



Playtime, Jacques Tati, 1963–1967.

Playtime was an absurdist take on the homogeneous and ubiquitous character of modern architecture, where only the colour of a bus allows a tourist to differentiate Paris from London. It highlighted a dogmatism that had stripped buildings down to their bare formal elements, rendering them highly efficient, abstract containers.

Vattenfall Haus, Hamburg, Arne Jacobsen, 1963–1969.

The fundamental 'shelter' built into the crust of the earth had become a highly sophisticated building envelope separating us from the elements of our own ecosystem. With nature excluded and reduced to a mere backdrop, it was so much easier to silence. The year 1964 was both the peak and a tipping point.

1964: A Pivotal Moment

In 1964, a highly efficient mutation of modernism hit its peak just as the global population saw its greatest increase in known history. Before and after 1964, this growth rate was never equalled. This was no coincidence. The year 1964 represents a pivotal moment in which humankind confronted the reciprocal relationship between our actions and our habitat, calling into question the doctrine of progress that saw humanity sprinting towards its own extinction.

> "The history of life on earth is a history of the interaction of living things and their surroundings. To an overwhelming extent, the physical form and the habits of the earth's vegetation and its animal life have been moulded and directed by the environment. Over the whole span of earthly time, the opposite effect, in which life modifies its surroundings, has been relatively slight. It is only within the moment of time represented by the twentieth century that one species – man – has acquired significant power to alter the nature of his world, and it is only within the past twenty-five years that this power has achieved such magnitude that it endangers the whole earth and its life."[61] –Rachel Carson

Nuclear weapons testing at Bikini Atoll, mid-1946, less than a year after the destruction of Nagasaki.

The modern world was a space of nuclear, extraterrestrial, chemical and antibiotic activity.[63] Through plain naivety and vain domination, humankind had constructed a potentially deadly habitat. As humankind confronted its frailty, the nature of modern life and the direction of the modern city no longer seemed like a viable blueprint for the future.

Modernity was a gradual process, but the modernization and mechanization of the Western household came with a heavy thud. Machines intruded on a relatively insular, parochial society accustomed to doing things by hand, and the speed, absurdity and confusion of this new world was perfectly captured by popular culture. Lining up the films of Jacques Tati illustrates the rush to keep up with global progress (*Jour de Fête*, 1949), the struggle with a technologically advanced suburban lifestyle (*Mon Oncle*, 1957), and the austere and antiseptic nature of a highly efficient modern city (*Playtime*, 1964–67).

François, a local postman, becomes obsessed with keeping up with the speed and efficiency of the US postal service air delivery by retrofitting his bicycle. *Jour de Fête*, Jacques Tati, 1949.

Frustrated with automated, ultra-modern surburbia, Monsieur Hulot pines for his muddled urban apartment. *Mon Oncle*, Jacques Tati, 1967.

The homogenous architecture of the modern city in *Playtime*, Jacques Tati, 1967.

After World War II, humankind manipulated nature to feed a growing population. The Green Revolution brought chemical technology (pesticides, herbicides, fertilizers) and new breeds of high-yield crops to greatly increase global food production.[62] Technology allowed crops to be cultivated in places they otherwise wouldn't grow. Humankind developed a false sense of security and progress, ever more reliant on chemicals and irrigation to prop up overpopulation.

Aerial spraying of DDT to control the tussock moth, Latah County, Idaho, 1947.

With the revelatory work *Silent Spring*, biologist Rachel Carson detailed the devastating effects of DDT and pesticides and condemned this utterly unsustainable practice. Carson calmly and eloquently explained how, in a rush to feed an ever-growing population, humankind was foolishly poisoning its own habitat, and thus itself. This awakening coincided with humankind's first attempts to leave the planet. The release of the first satellite image of Earth from Apollo 8 brought the fields of science and ecology to the fore. Seeing our environment from this new vantage point reinforced a growing comprehension of the earth as delicate and finite.

Apollo 8's view of Earth rising over the moon has proved to be the most enduring image we have of our fragile world. NASA, 1968.

The Great Leap Forward was an effort to rapidly transform the People's Republic of China from an agrarian to an industrial society, 1958–1962.

This affected 400000 square kilometres of land, earning the area the name Dust Bowl.

The Sovjet operetta Cherry Town (Черемушки / Cheryomushki), with music by Dmitri Sjostakóvitsj was adapted into a satirical piece of propaganda by Gerbert Rappaport‘s in 1963. The film closes with an explosives expert being catapulted to his lover on a balcony after blowing up the last remaining datcha.

Shostakovich himself wrote to a friend days before the opening in 1956:

“I am behaving very properly and attending rehearsals of my operetta.
I am burning with shame. If you have any thoughts of coming, I advise you to think again.
It is not worth spending time to feast your eyes and ears on my disgrace. Boring, unimaginative, stupid. This is, in confidence, all I have to tell you.”

bury

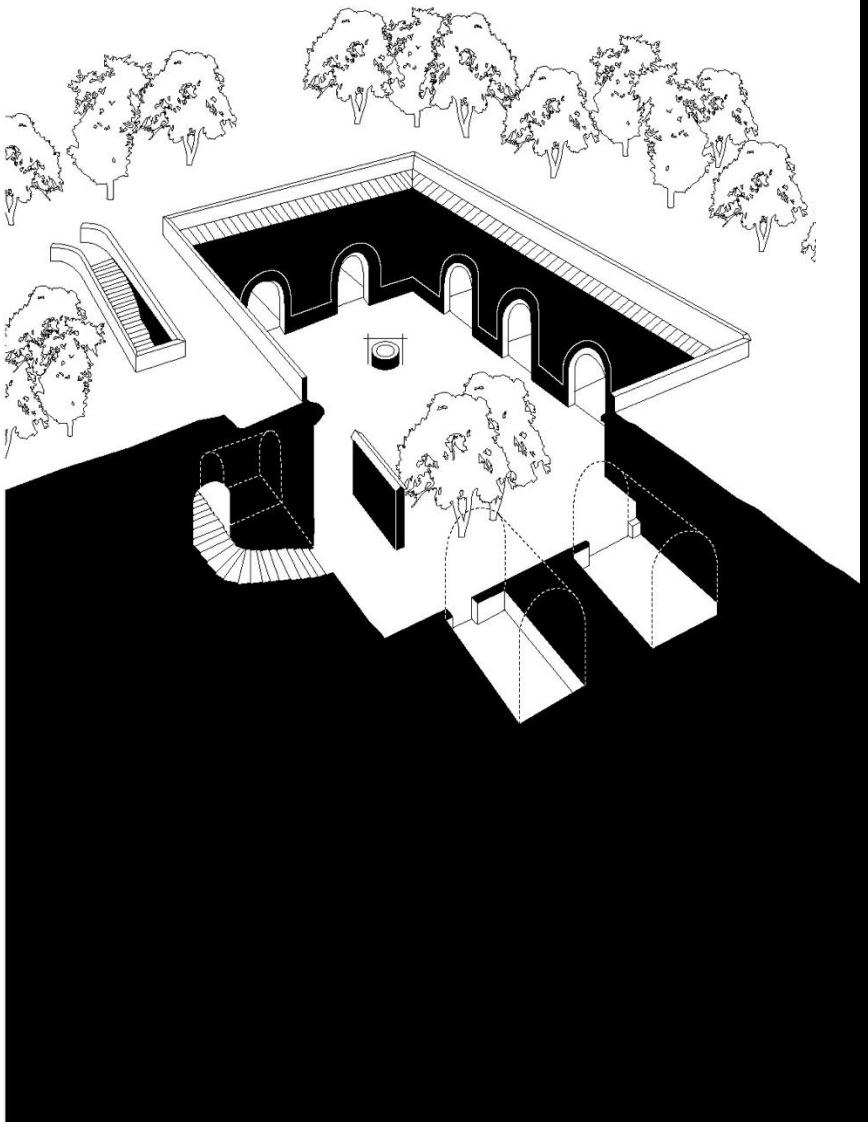
The Yaodong
Loess Plateau, China
300 BCE–present

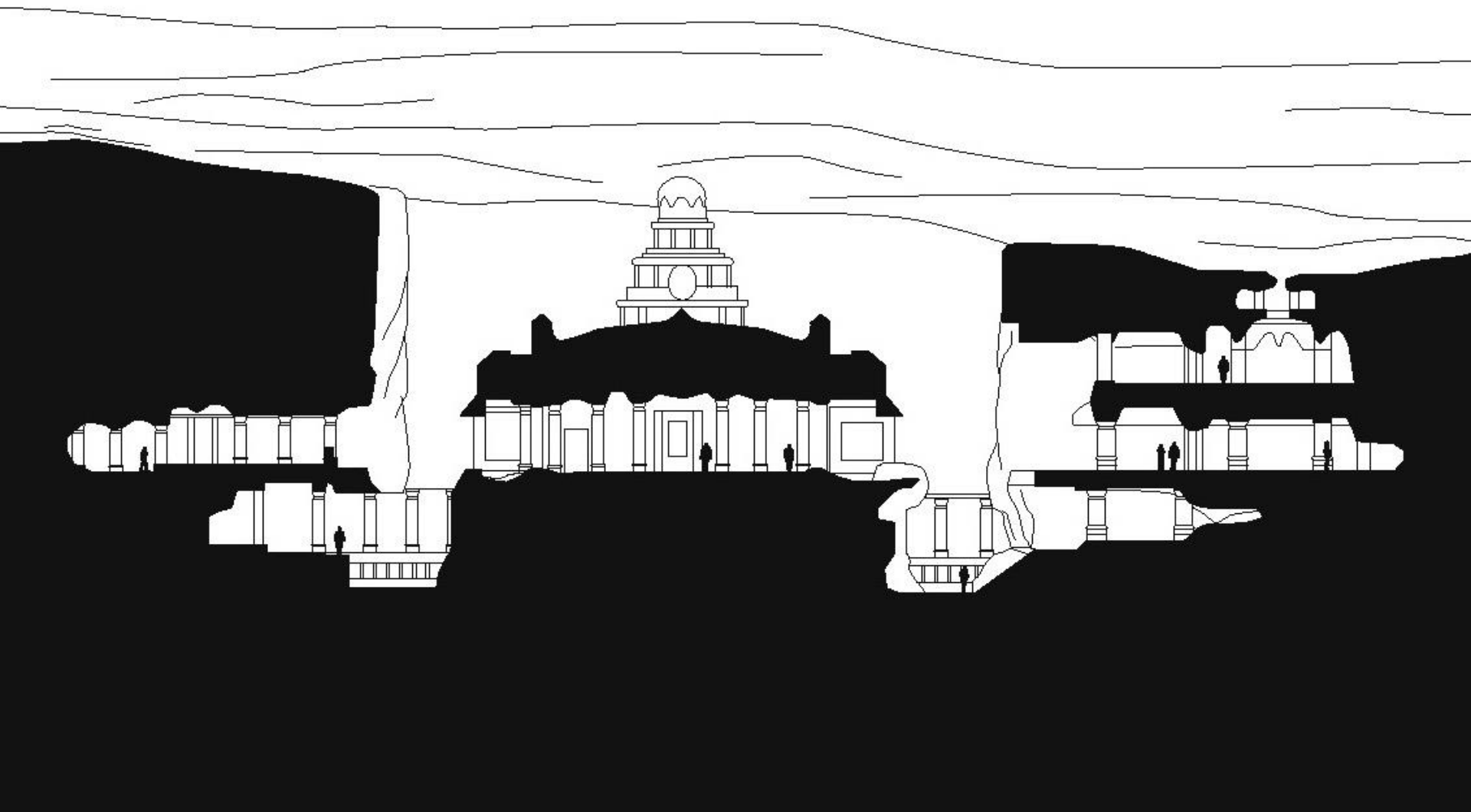
Both Mao Zedong and Xi Jinping lived in a cave dwelling for several years. Mao used the time he spent here for reading, writing and gardening right after the Long March in 1935, when his ascent to power started. Xi was sent to the Shaanxi province for educational purposes in 1968. He immediately escaped, but his mother allowed him to be sent back, and he lived another seven years in a cave. He only cried twice: when he was sent down to this region and when he moved away in 1975, both in sorrow. It shaped their lives and is in some way proof of the classless qualities of the Yaodong.

Mao Zedong, Yan'an cave dwelling, 1938.

"The cave the Chinese president called home". Xi Jinping visits former cave dwelling in Liangjiahe, 2016.

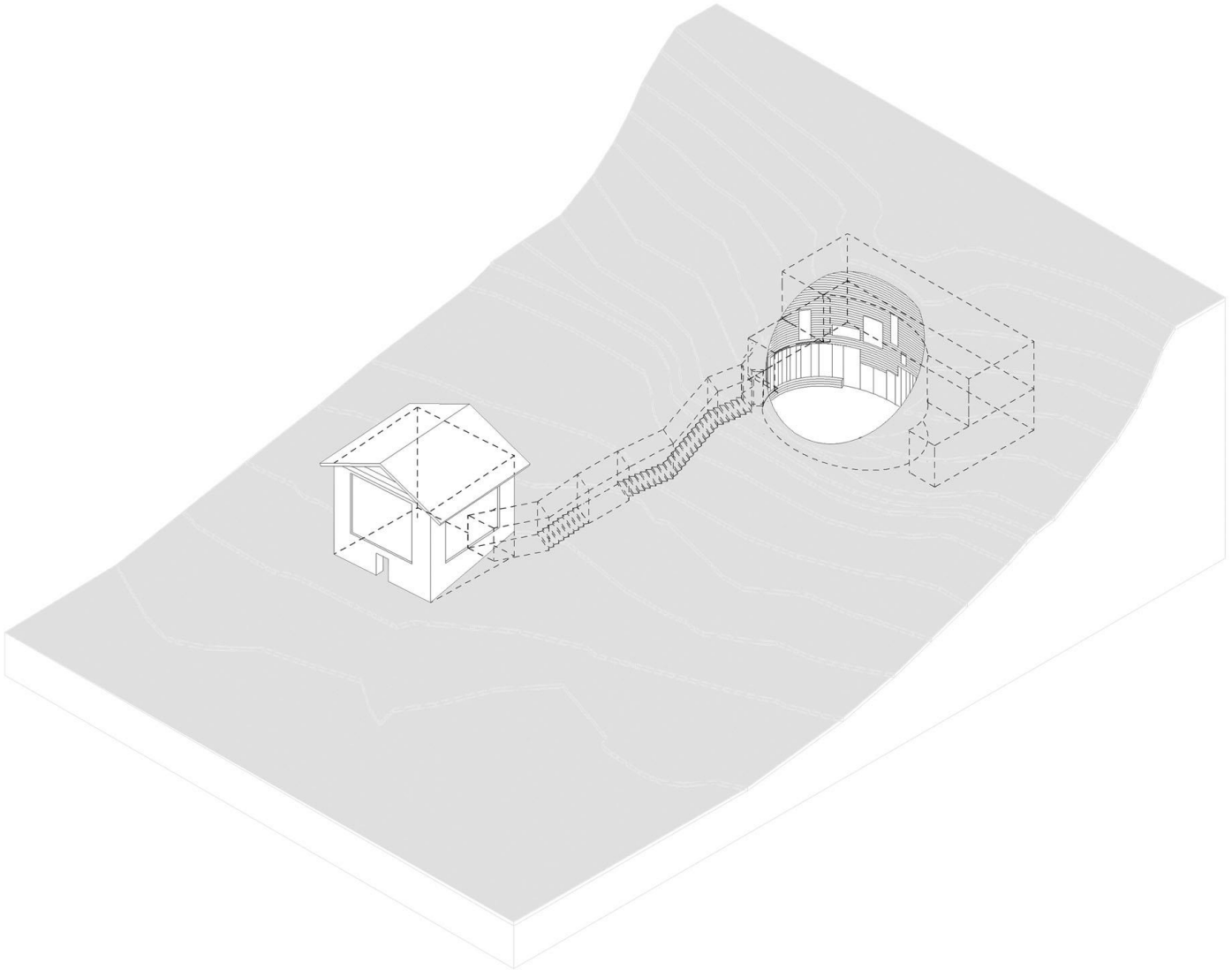
Subterranean dwellings arranged around a sunken courtyard.

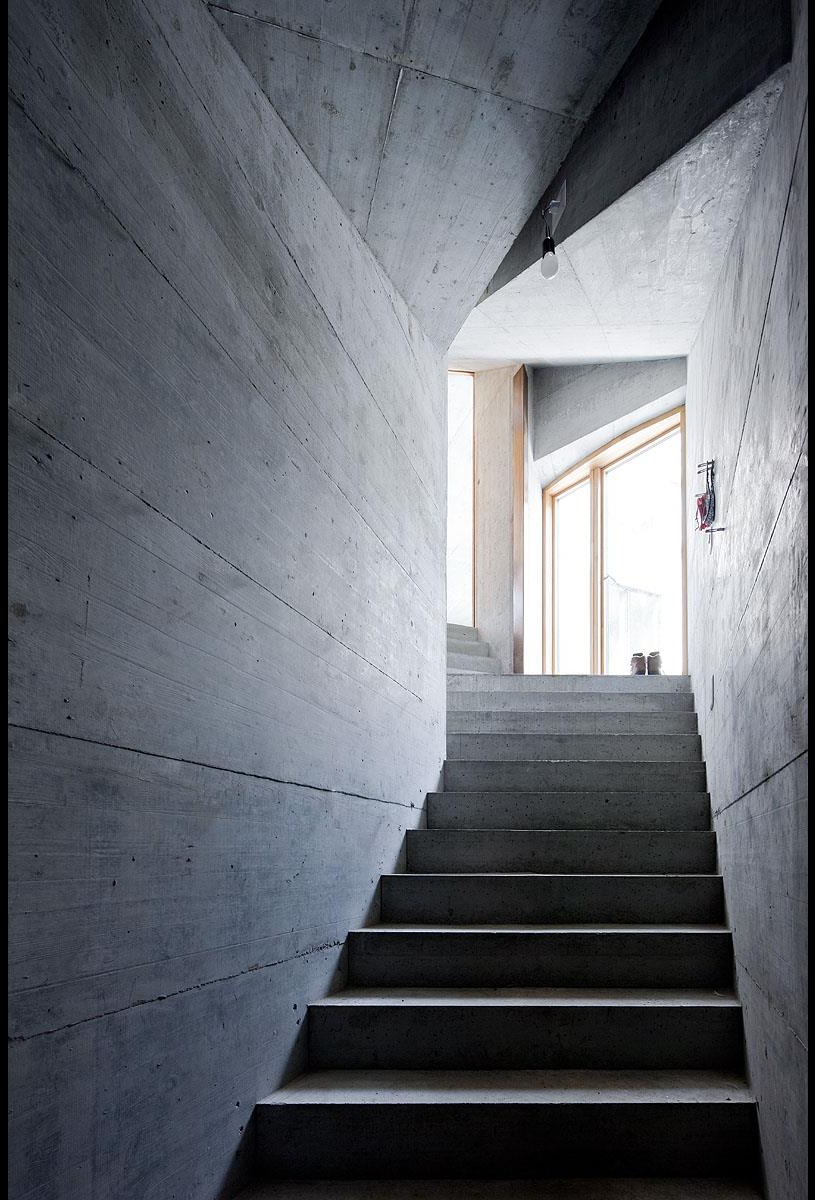




Villa Vals

Switzerland





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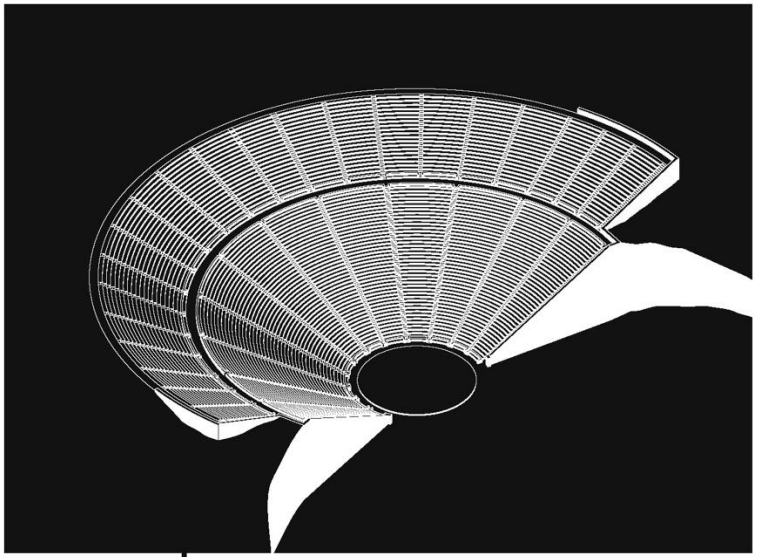
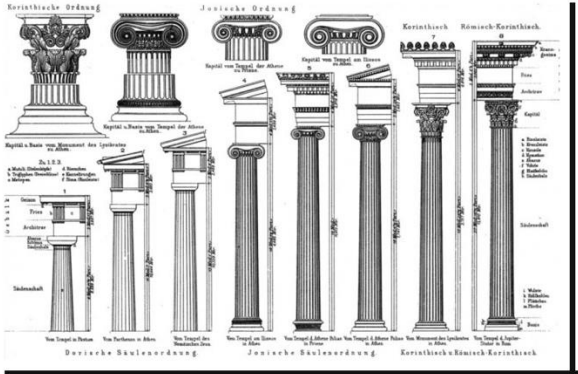
Ancient Theatre Epidaurus, Greece Polykleitos the Younger 330–200 BCE

Ancient Greece is the celebrated birthplace of Western civilization, a pivotal era in which humankind untied itself from nature, developing its own rules. Society was conceived, democracy was installed, and a political, religious, cultural and educational system was refined. Space and habitation were organized, not by the laws of nature but by the abstract ideals of humans, and an architecture of classical orders, mathematical systems of proportions and ornamentation was invented.



Axonometry of the Ancient Theatre of Epidaurus.

The architectural forms of the earliest temples (600–500 BCE) were made from timber.[6] But gradually, solidified and polished stone replaced timber, as if the structure had undergone petrification.[7]

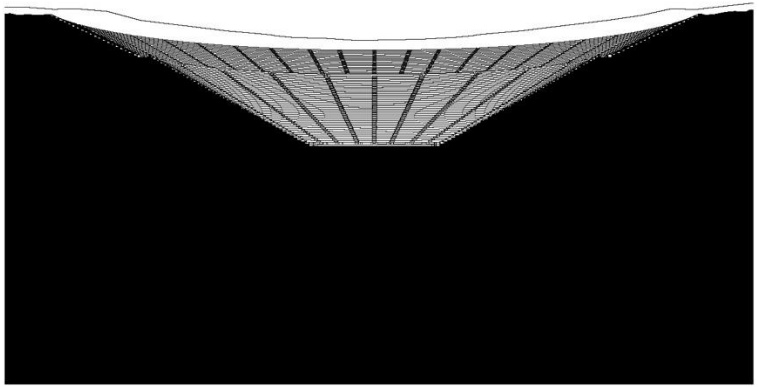


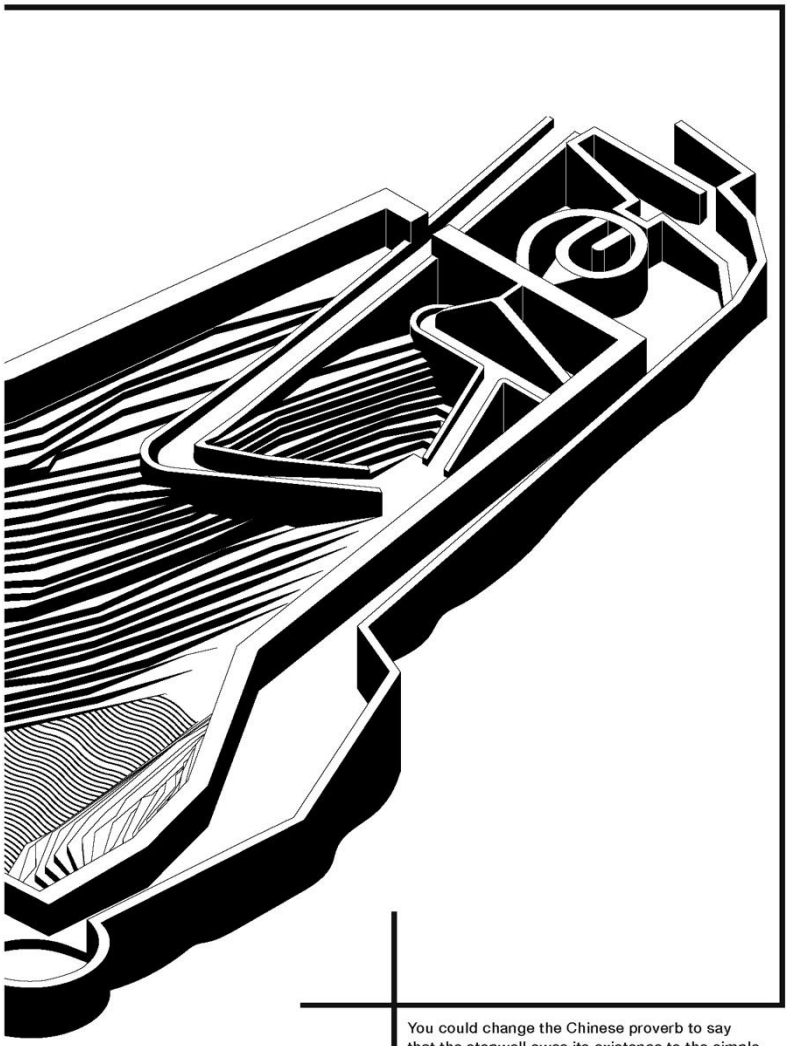
The orders of Ancient Greece: Doric, Ionic and Corinthian.

Whilst the Ionic and Corinthian order still referenced nature with their cochlea and acanthus shape, the simpler Doric order did not. Stronger and cheaper to build, the Doric order emerged as the predominant element and classical architecture no longer referenced natural elements.

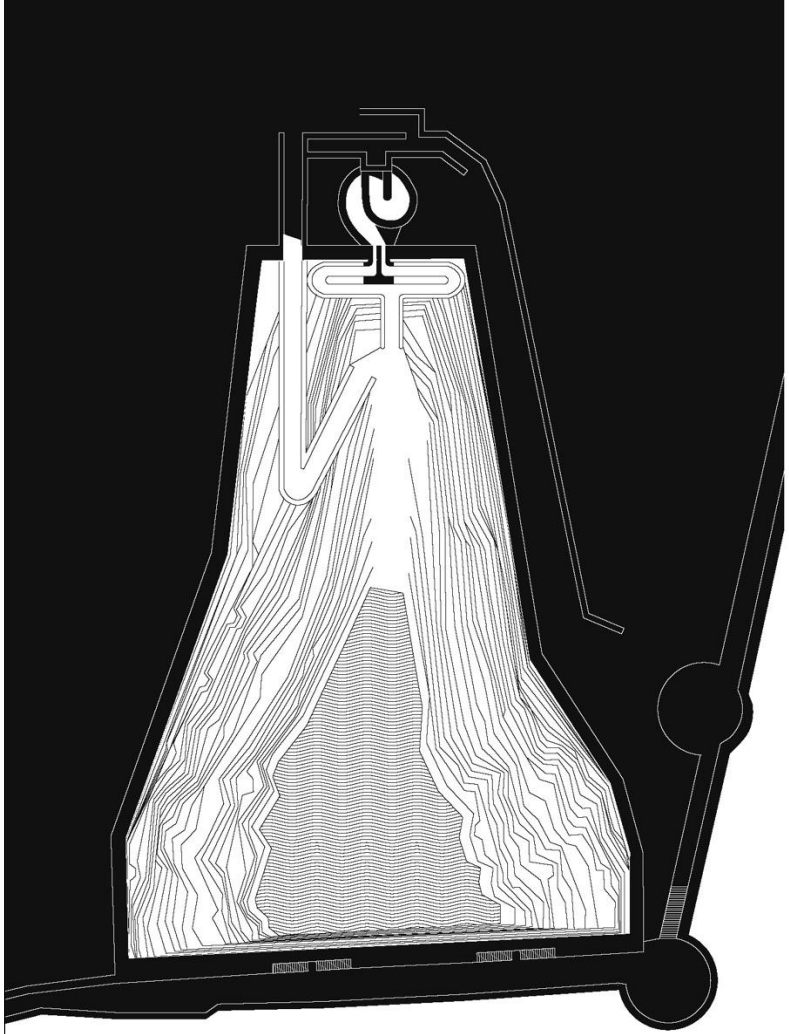
There were some constructions, like the Ancient Theatre of Epidaurus, that couldn't do without. And why should they? The backdrop behind the ***skênê*** is perfect for dramatic performances, and the semicircular site made it a perfect fit for an otherwise huge building to be erected.

Section of the theatre.



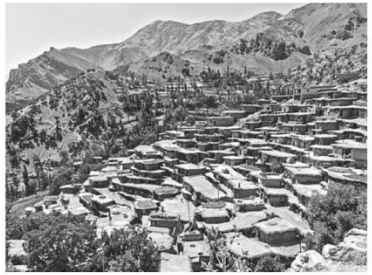


You could change the Chinese proverb to say that the stepwell owes its existence to the simple fact that humankind, with all their artistic pretentions, sophistication and many accomplishments, need water, also during periods when it hardly rains.

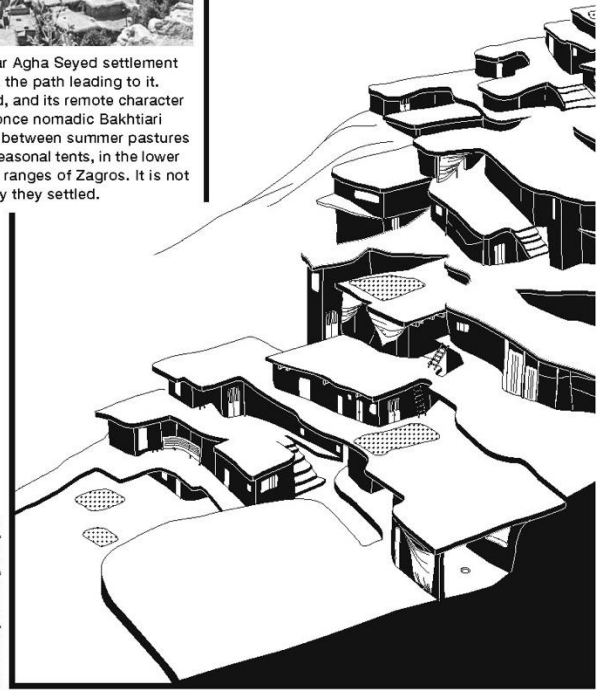


Plan of Nahargarh Fort Baori.

Sar Agha Seyed
Chaharmahal and Bakhtiari Province, Iran
Date unknown

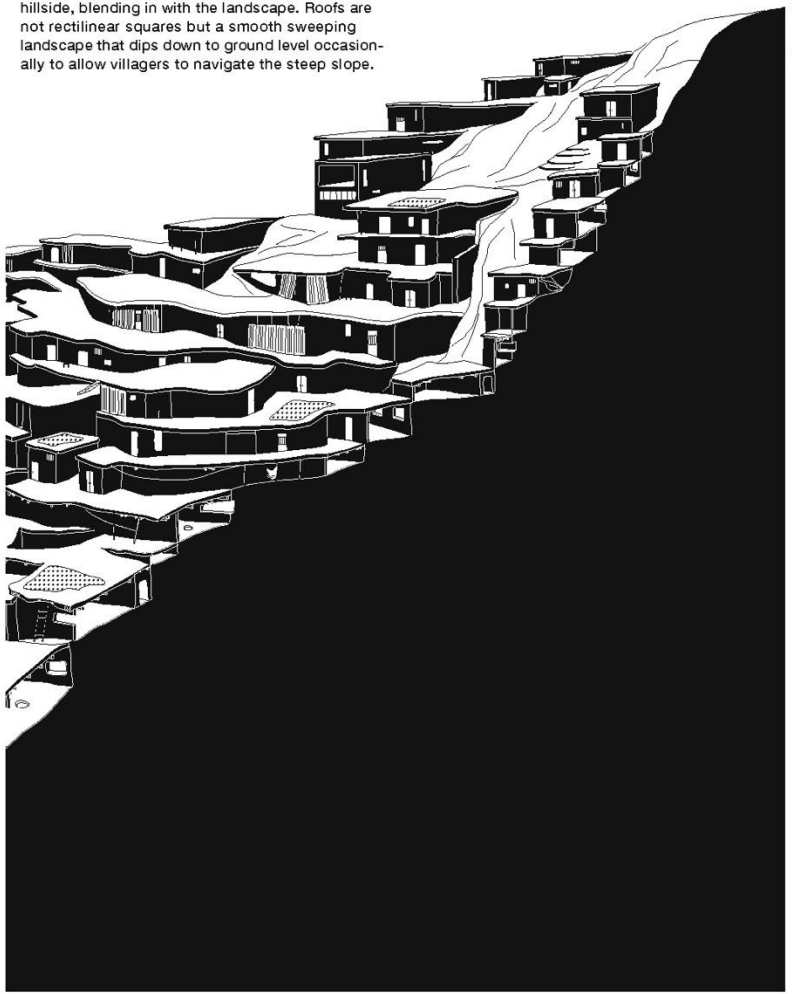


The story behind the Sar Agha Seyed settlement is just as mysterious as the path leading to it. There is actually no road, and its remote character seems deliberate. The once nomadic Bakhtiari people used to migrate between summer pastures and winter *garmsīr*, or seasonal tents, in the lower valleys of the mountain ranges of Zagros. It is not fully clear when and why they settled.

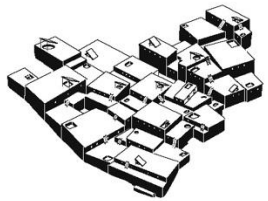


Axonometry of Sar Agha Seyed.

The urban layout of Sar Agha Seyed consists of a haphazard stitching together of houses and barns. Unlike the stepped villages of Palangan or Masuleh, Sar Agha Seyed is embedded in the hill. Exploiting the slope, Sar Agha Seyed simply adds a level to the hillside, blending in with the landscape. Roofs are not rectilinear squares but a smooth sweeping landscape that dips down to ground level occasionally to allow villagers to navigate the steep slope.

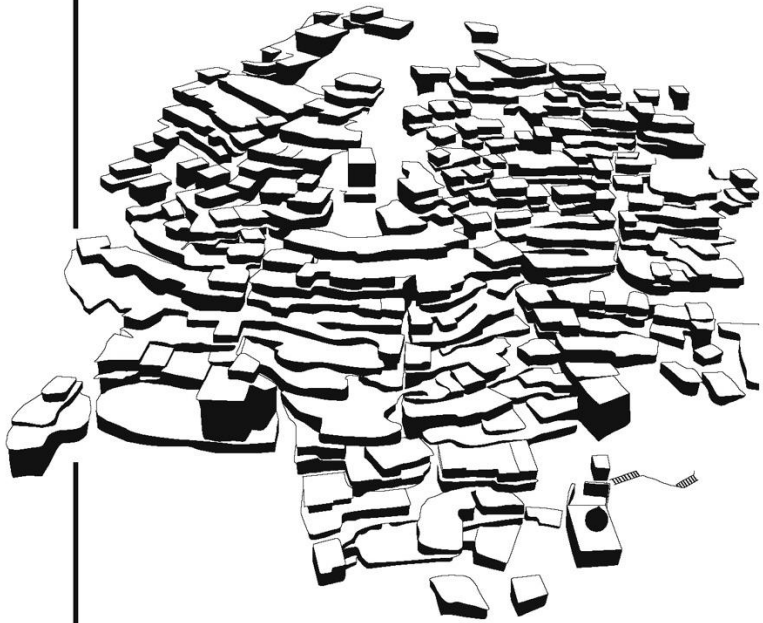


The roof edges are reminiscent of tent cloth. Villagers use the flat roofs just as the Bakhtiari nomads dried crops in front of their tents, except for the fact that here they use the roof of neighbours living one or two levels below them. Paths leading to all houses are a combination of narrow back alleys, stairways in between and roof paths, flat, stepped or slightly inclined to reach the next level. The absence of clear boundaries, routing and the communal use of roofs has great similarities with the first-known urban settlement in Çatalhöyük and the existing small villages of northern Ghana and Mali.[11]

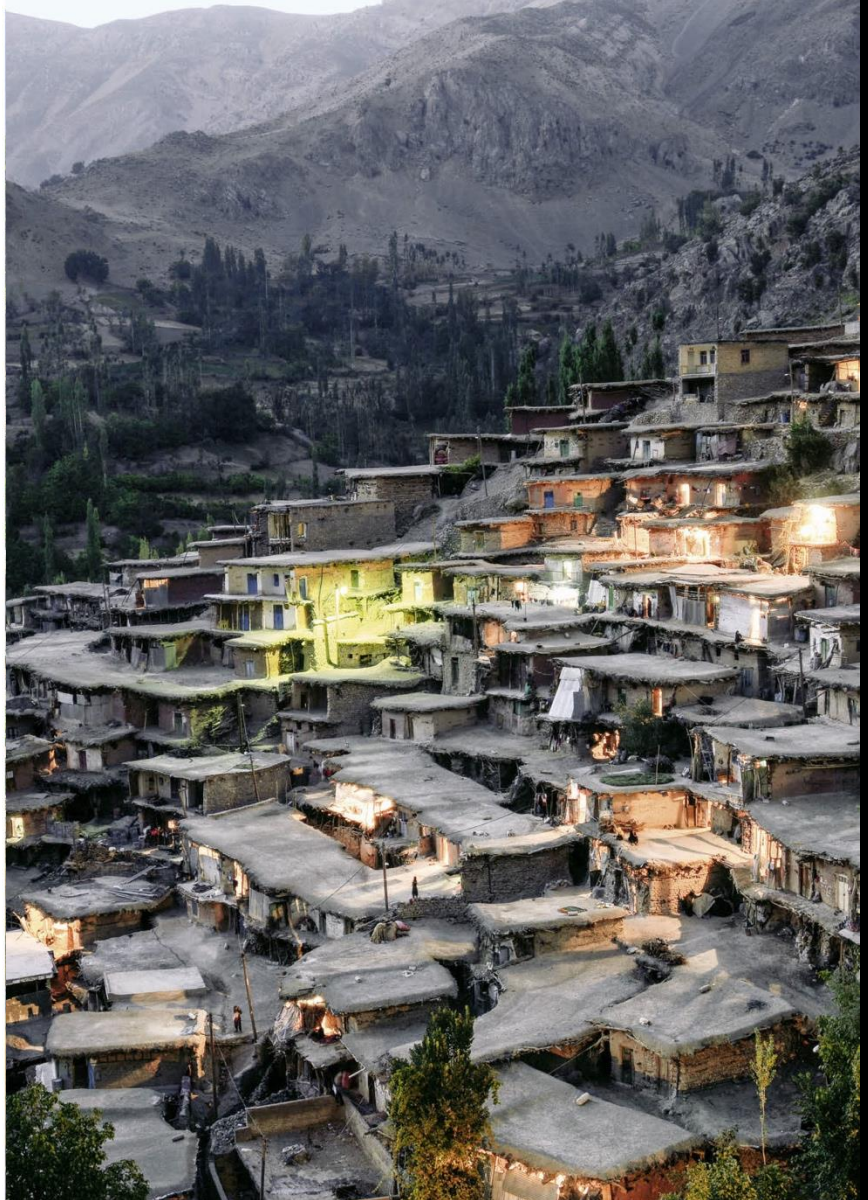


Çatalhöyük, 7500–5700 BCE.

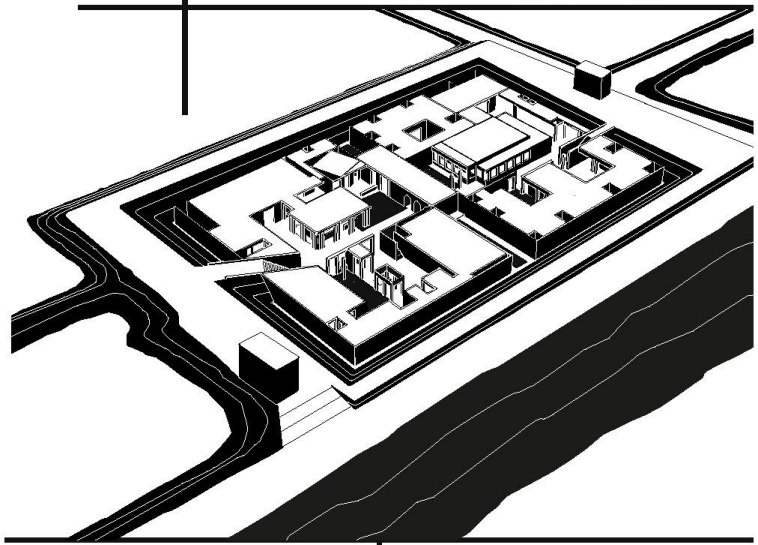
Village in northern Ghana, 2006.



Axonometry showing the flat roofs of the settlement.



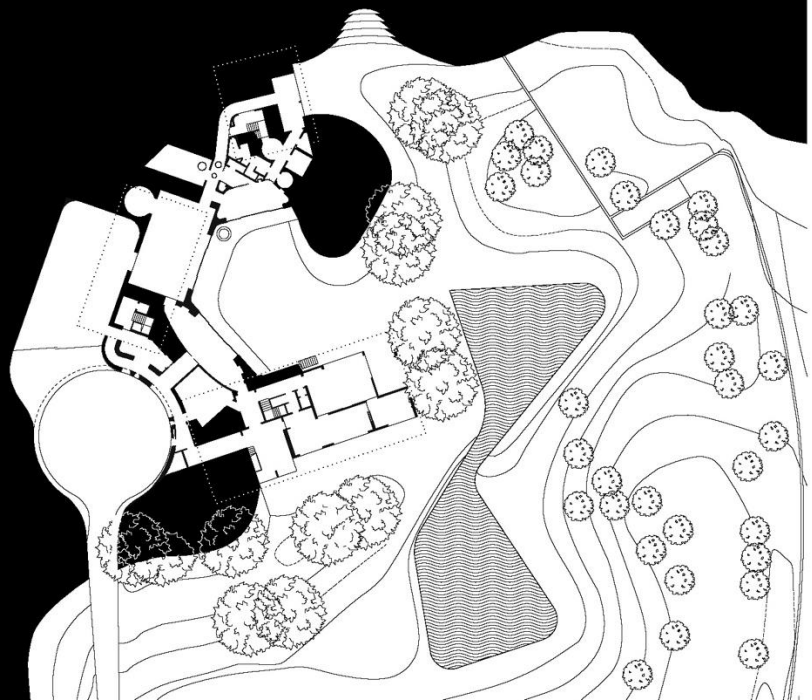
Friendship Centre
Gaibandha, Bangladesh
URBANA
2011



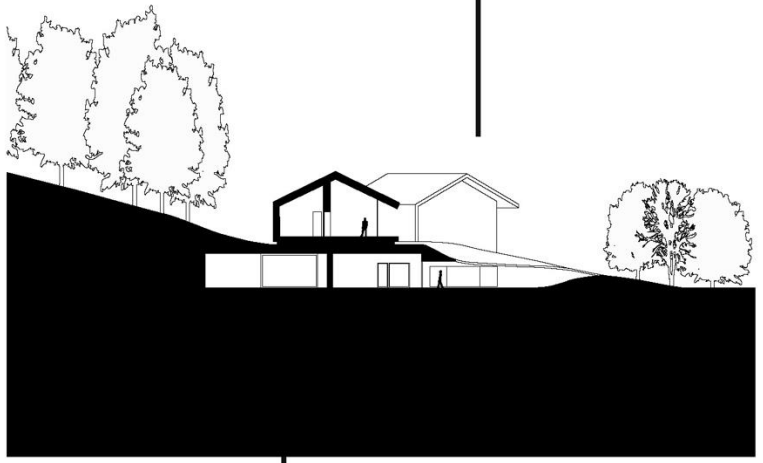
Axonometry of Friendship Centre.

The Friendship Centre by Kashef Mahboob Chowdhury and his practice URBANA is a highly efficient example of the manipulation of levels. Buildings in the low-lying area of Gaibandha can only be secured from flooding when built on stilts. Since the area is also prone to earthquakes, engineering this is fairly expensive, so they made a calculated decision to dig the project another metre down and use the excess earth to build a dike around the centre.

Lower level plan of the Hunting Ranch.



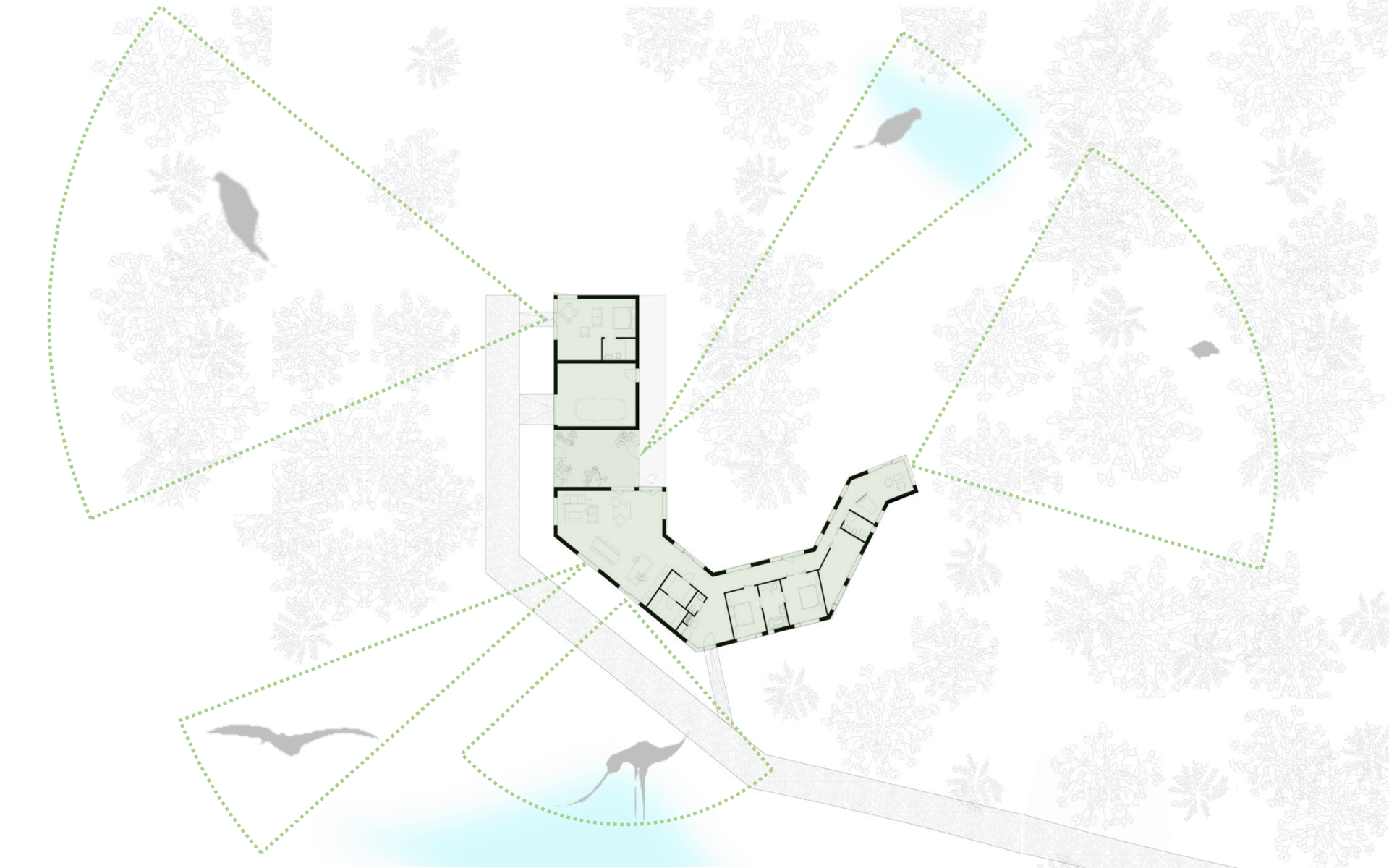
Like Maison à Bordeaux, the Hunting Ranch is a bit of a Frankenstein, a haphazard stitching together of autonomous programmes. Above ground, it creates a small village. Three volumes – one for the owner, one for the family, and one for guests – are orientated around a sunken courtyard, looking to the landscape to soften its edges. Luckily, a considerable amount of auxiliary and amenity space doesn't need daylight, so this serves as a foundation, organizing the domestic programme. A 'back of house', including technical rooms, ten-car garage, wine cellar and security is concealed along with a cinema, wellness space, fitness area and large reception room.



Section of Hunting Ranch.

The house withdraws from the meadow. The lower part of the house mediates between a hillside of dark woods and the low-lying open meadow and lake. All programmatic elements too big for the site are embedded in the hillside, snaking around existing trees.

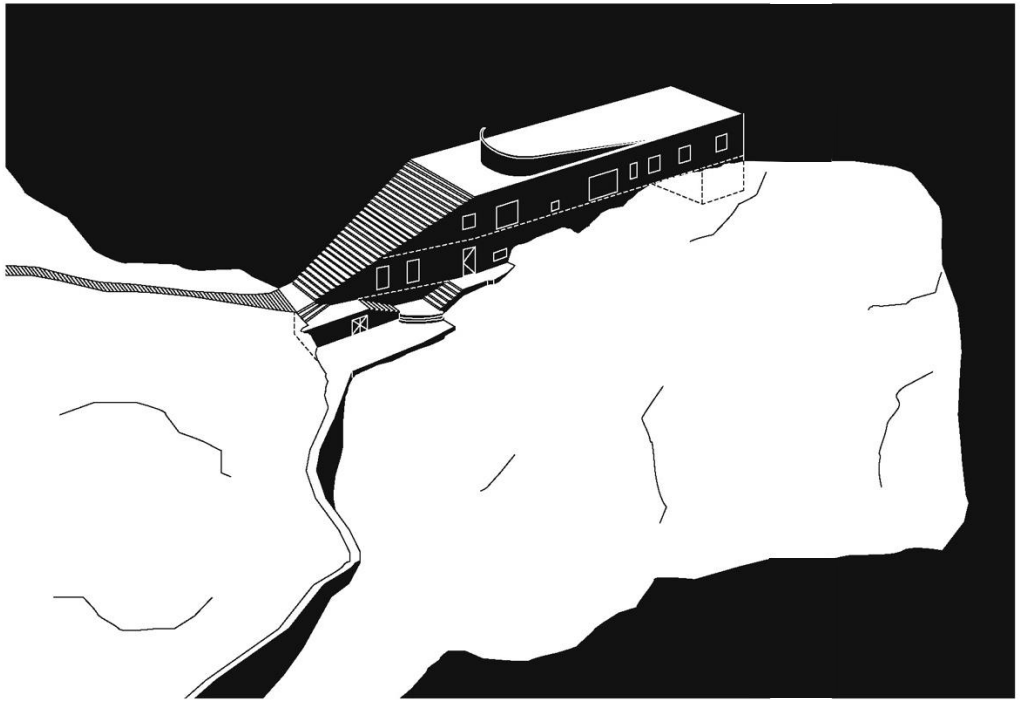
The Hunting Ranch draws on hunting traditions without taking any animal lives. It is a space for gathering, festivities and the telling of tall tales. The only space reserved for trophies is one small room, a man's cave with a window facing a massive pine tree. In the end it is for a client with a great love of the woods.



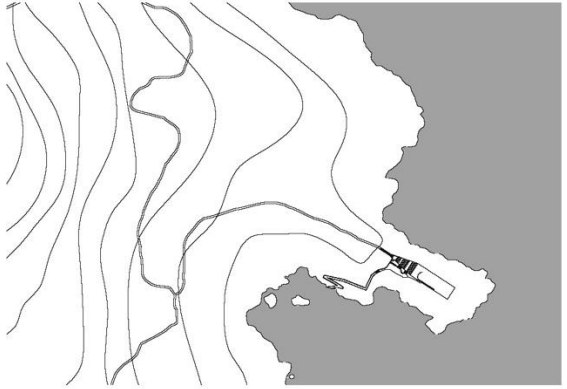
absorb

Villa Malaparte
Capri, Italy
Curzio Malaparte
1938–1943

On a mesmerizing spot on a pinnacle on the island of Capri, Curzio Malaparte asked the architect Adalberto Libera to design a house. ***Malaparte***, meaning bad part or side, was the pseudonym of Kurt Erich Suckert and a play on ***Bonaparte***, meaning good side. Napoleon's exile to Elba, another beautiful island in the Mediterranean, ended in misery, so Malaparte chose a contrary name, hoping his exile would end happily. A very difficult character, he abandoned the ideas of Libera and designed the house himself with the help of stonemason Adolfo Amitrano.



Axonometry of Villa Malaparte.



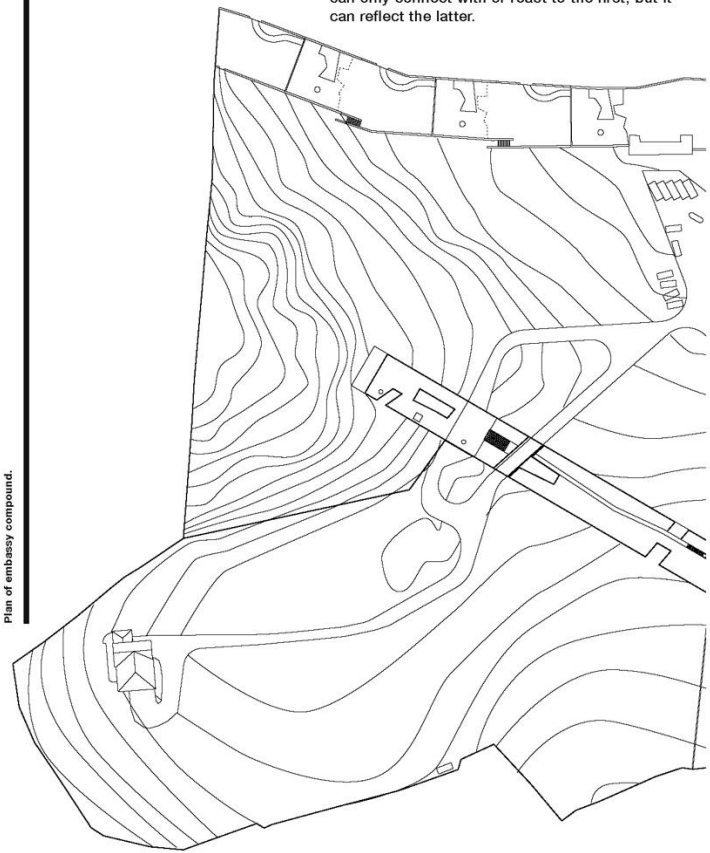
Malaparte's peninsula, Capri, Italy.

Brigitte Bardot and Michel Piccoli in *Le Mépris* (*Contempt*), directed by Jean-Luc Godard, 1963.

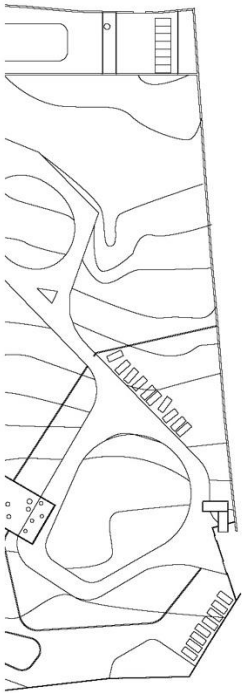
Not bothered by lack of knowledge, the client and mason constructed a jewel of unequalled but also unapproachable beauty. Not only is the house inaccessible by car and a tough climb by boat, but it also has an unworldly, unattainable character. Like the serene image of Brigitte Bardot sunbathing on its open roof in the unsettling film ***Le Mépris***, it should not be disturbed. And for thirty years following Malaparte's death it wasn't. It was abandoned, left to become a beautiful pink ruin.

Dutch Embassy
Addis Ababa, Ethiopia
SeARCH & Dick van Gameren
1998–2005

There are two landscapes on an embassy compound. The physical one of the host country, and an invisible one of the guest on site. A building can only connect with or react to the first, but it can reflect the latter.



Plan of embassy compound.

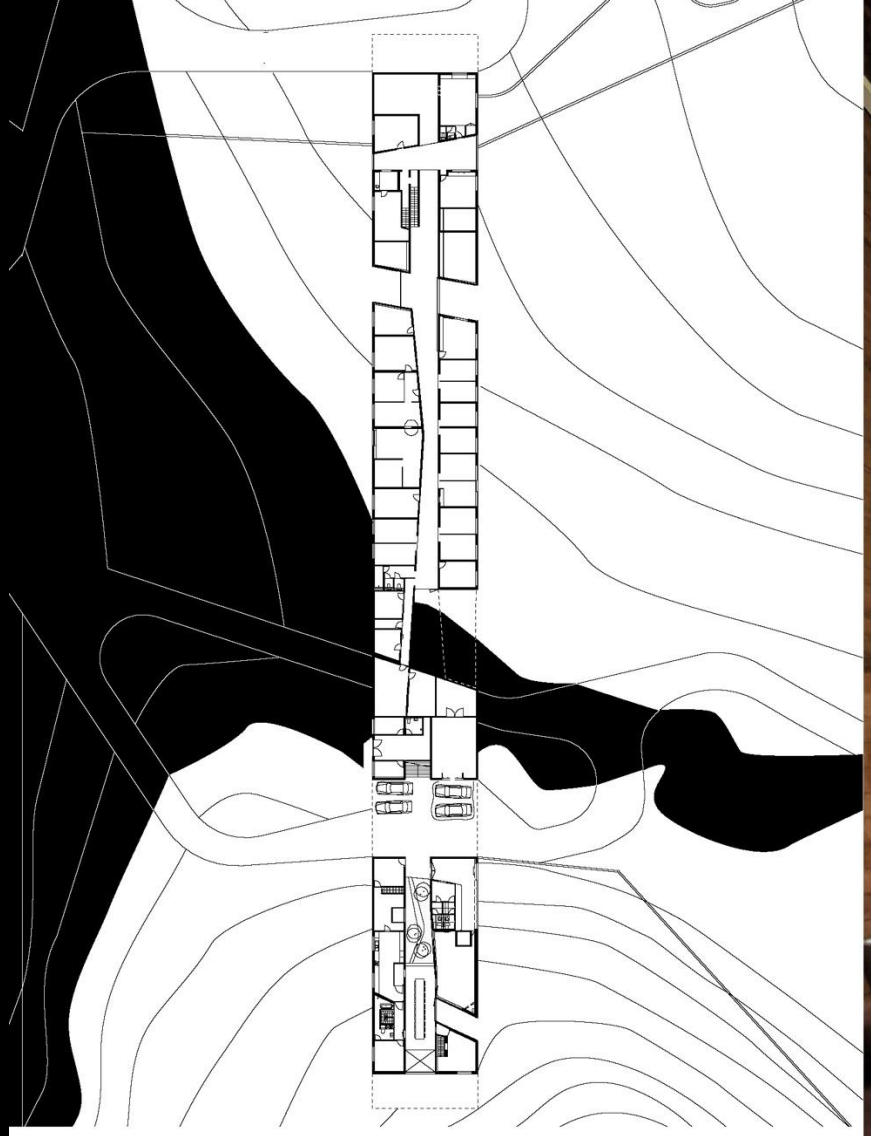


Villager in the Gheralta Mountains, Ethiopia.

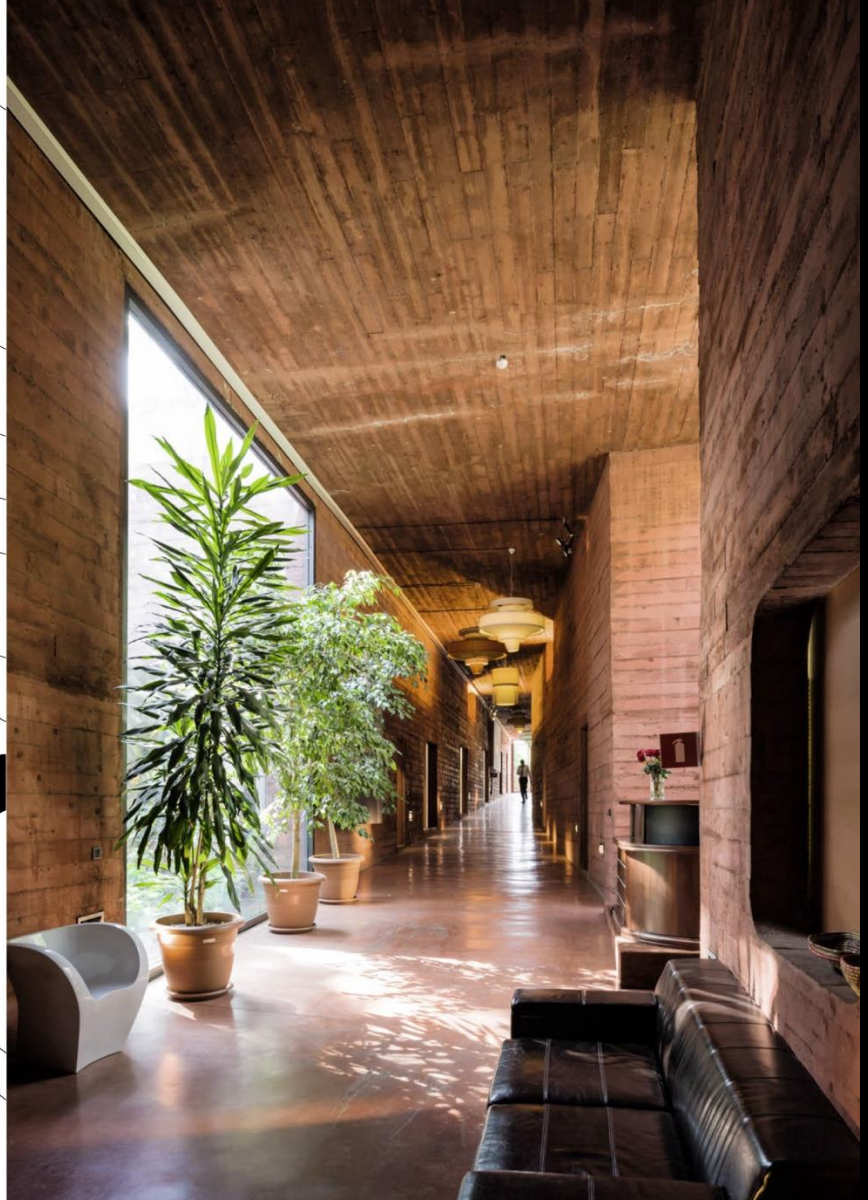
There couldn't be two countries more different than Ethiopia and the Netherlands. The latter is as flat as a pancake, and more than half of the population lives below sea level. The Ethiopian landscape, in contrast, ranges from rugged alpine terrain to one of the hottest, driest deserts in the world, the Danakil Depression. Its capital, Addis Ababa, is fourth in the world when it comes to altitude, lying 2400 metres above sea level.

Without dikes, much of the Netherlands would be inundated with water.

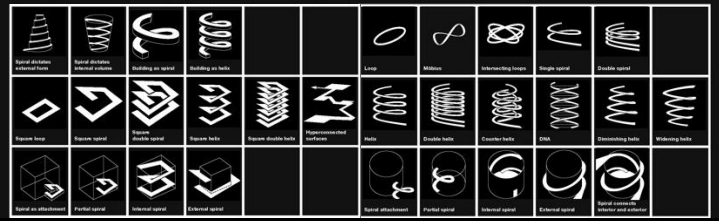
The Dutch embassy and residence building could be seen as a re-enactment of Dutch conditions within an Ethiopian landscape.



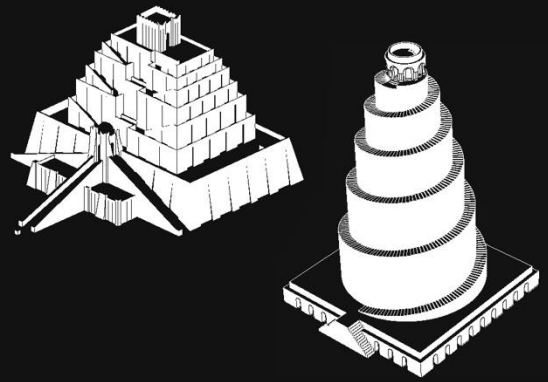
of the residence (below the hill) and the chancellery (above the hill).



spiral

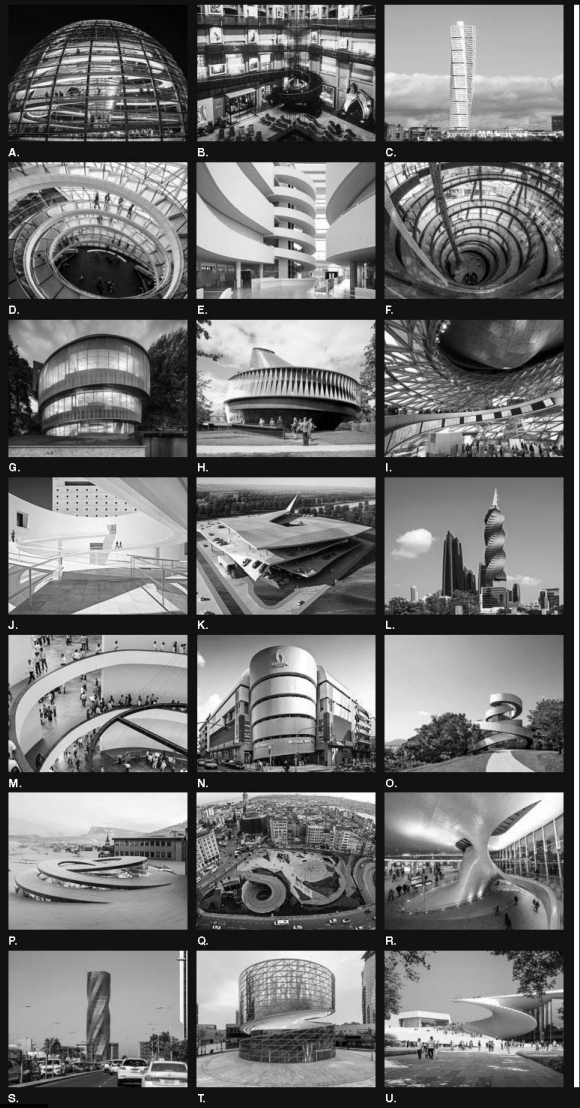


A spiralling architecture symbolizes our ascension to a higher state. It was not born out of necessity, like shelter. It was introduced to architecture as a ceremonial element. Humans built artificial mountains on the vast plains of ancient Mesopotamia. These early attempts to reach a higher plane were constructed out of the earth. The ground was baked, stacked and pulled upwards to form the stepped pyramid of the ziggurat, a momentous effort to get closer to the heavens.



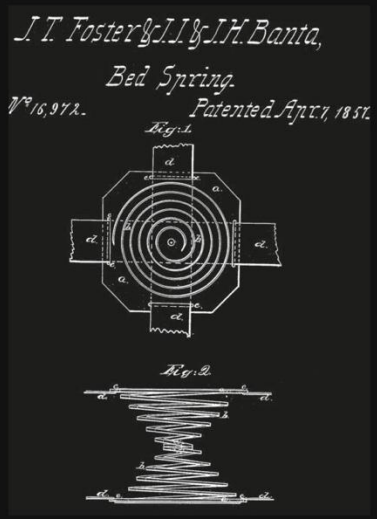
Etemenanki Ziggurat, Babylon (north of Hillah, Iraq), 604–562 BCE (left) and Minaret al-Malwiya, Samarra, Iraq, 848–852 CE (right).

Ancient Mesopotamians wound upwards in the quest for wisdom, traversing a series of stepped platforms, each receding inwards towards the summit. The external spiralling circulation was not purely a route. It shaped geometry, defining the fundamental form of the building. While the ziggurat was orthogonal, the Islamic minaret's circular form offered a fluid spiralling procession. From this conic tower, the gate between heaven and earth, humankind was summoned.

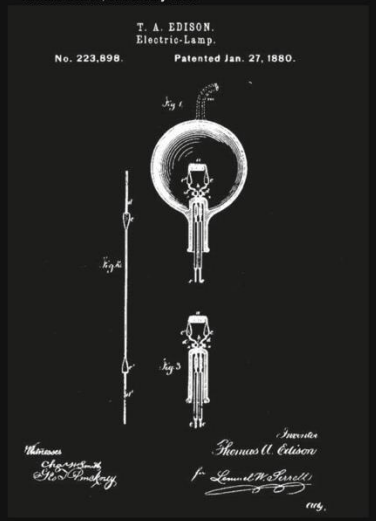


A. Reichstag Dome, Berlin, Germany, Foster + Partners, 1999.
B. Mole Antonelliana, Turin, Italy, Gianfranco Gritella & associates, 2000.
C. Turning Torso, Malmö, Sweden, Santiago Calatrava, 2001.
D. City Hall, London, United Kingdom, Foster + Partners, 2002.
E. ARoS Art Museum, Aarhus, Denmark, Schmidt Hammer Lassen, 2004.
F. CosmoCaixa Science Museum, Barcelona, Spain, Robert Terradas, 2004.
G. Cocoon, Zurich, Switzerland, Evolution Design, 2005.
H. Serpentine Gallery Pavilion, London, United Kingdom, Olafur Eliasson & Kjetil Thorsen, 2007.
I. BMW World, Munich, Germany, Coop Himmelb(l)au, 2009.
J. Andalucía's Museum of Memory, Granada, Spain, Alberto Campo Baeza, 2010.
K. Automobile Museum, Nanjing, China, 3Gatti Architecture Studio, 2010.
L. F&F Tower, Panama City, Panama, Pinzón Lozano & Asociados Arquitectos, 2011.
M. Hanoi Museum, Vietnam, Gerkan Marg and Partners, 2011.
N. Hellenic Motor Museum, Athens, Greece, 2011.
O. Ribbon Chapel, Hiroshima, Japan, Hiroshi Nakamura & NAP, 2013.
P. Audemars Piguet Museum, Vallée de Joux, Switzerland, BIG, 2014.
Q. Şişhane Park, Istanbul, Turkey, SANALarc, 2014.
R. Central Station, Arnhem, Netherlands, UNStudio, 2015.
S. United Tower, Manama, Bahrain, Ahmed Al Qaed Construction, 2016.
T. Heli-stage, Shaoxing, China, ATAH, 2018.
U. Shanghai Grand Opera House, Shanghai, China, Snøhetta, 2019.

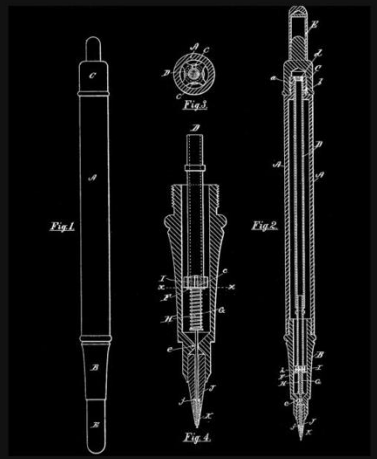
To sleep: Bed spring patent no. 16972A, 7 April 1857.



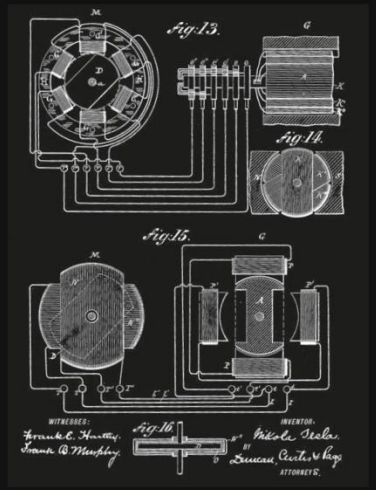
To light: Bulb patent no. 223393 with a coil as glowing tip, Thomas Edison, 27 January 1880.



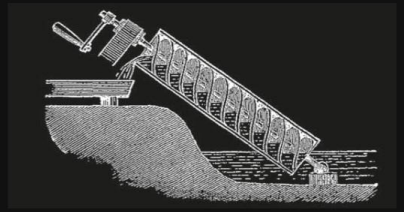
To write: Stylographic Pen patent no. 232604, Alonzo T. Cross, October 1880 (the spring was not for releasing the tip but for forcing ink into the tip of the pen).



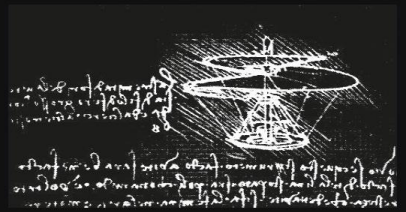
To drive (electric): Elektro Magnetic Motor, Nikola Tesla, 1 May 1888.



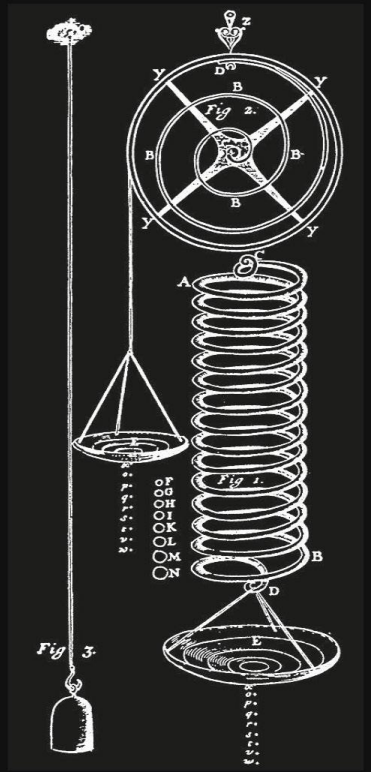
To raise water: Archimedes' screw, 250 BCE, still in common use for hydro power and water turbines.



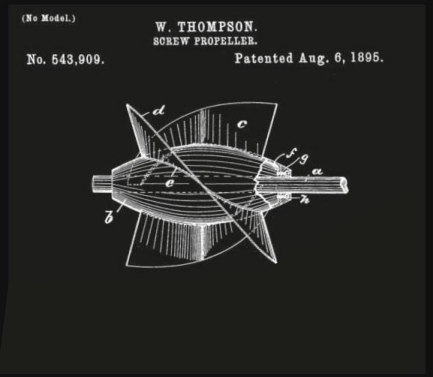
To fly: Spiralling Ornithopter, Leonardo da Vinci, 1485.

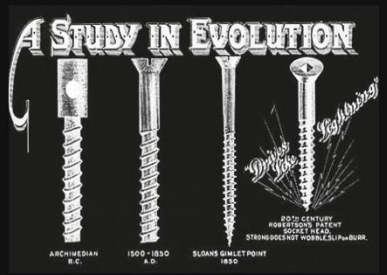


To define theory of elasticity: Coil sprint experiments, Robert Hooke, 1678.



To propel: Screw propeller, Francis Pettit, 1836.

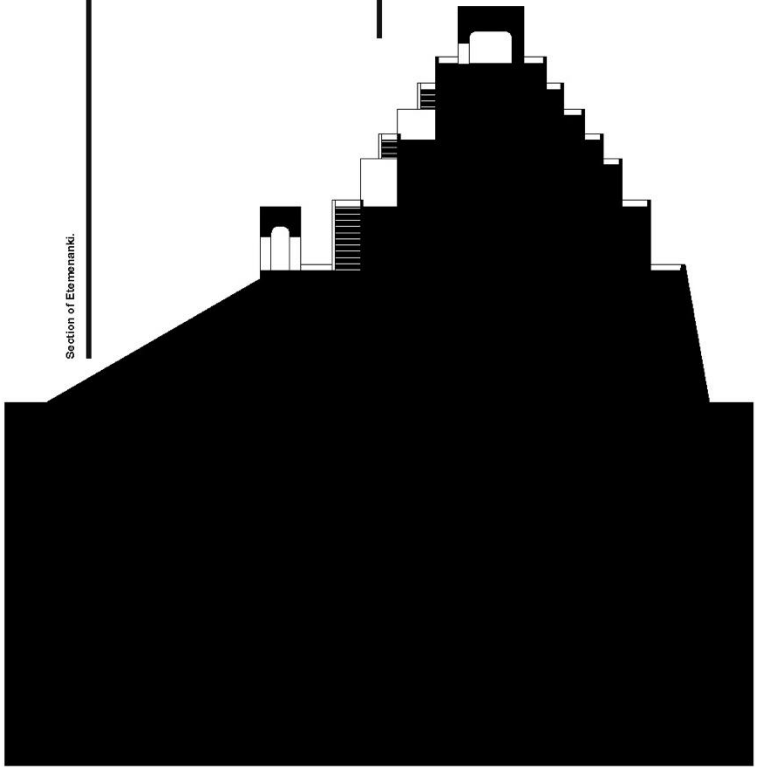




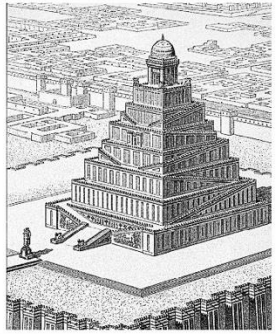
To fasten: Screw patent, P. L. Robertson, 1909.

Shape of Etemenanki carved on a black stone, the Tower of Babel Stele, 604–562 BCE.

Ancient clay tablets tell of a colossal ziggurat of seven successively receding storeys, which once reached a height of 91 metres.[10] At its summit sat the temple of Marduk, patron of the city of Babylon, described by its creator Nebuchadnezzar II as the 'House of the Seven Lights of the Earth'.

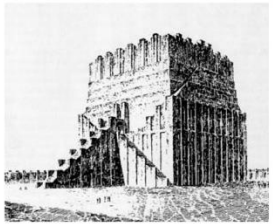


Section of Etemenanki.

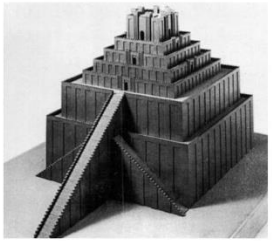


Reconstruction by Zénaïde A. Ragozin, 1889.

Plan of Etemenanki.

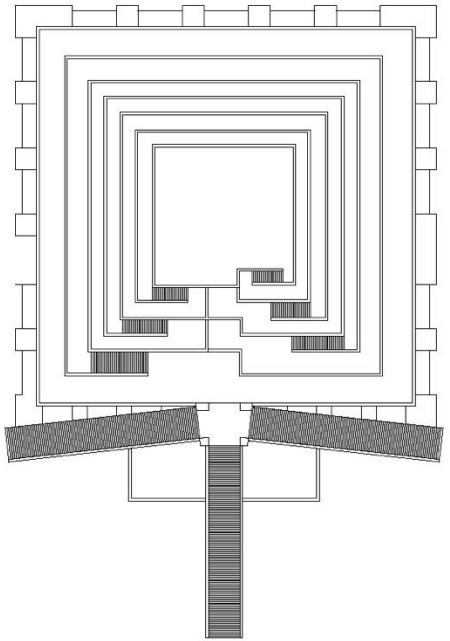


Reconstruction by Robert Koldewey, 1913.

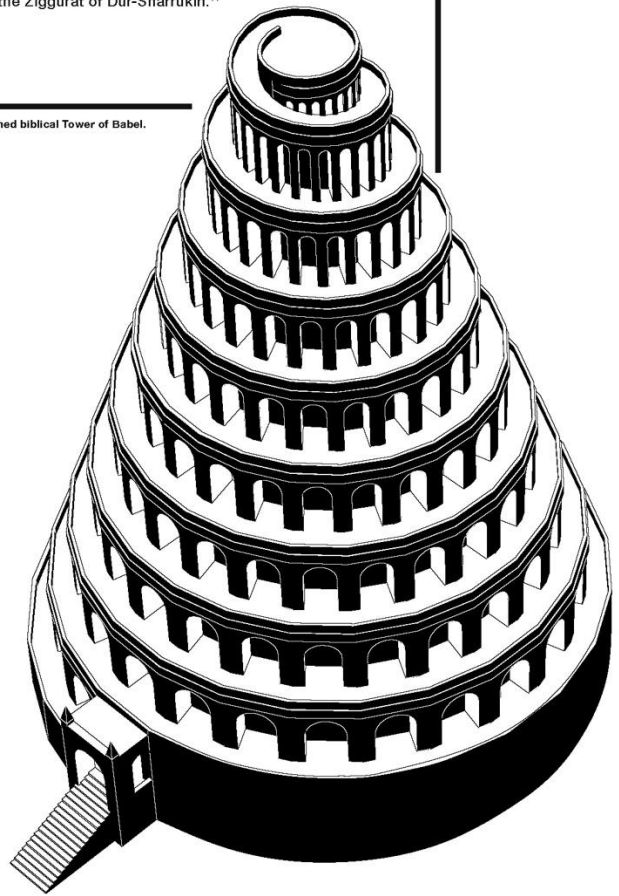


Reconstruction by Hans-Jörg Schmid, 1999.

Reconstruction by J. L. Montero Fenollós, 2013.



In 460 BCE Herodotus, a Greek historian with a penchant for exaggerating, described Etemenanki as an eight-tiered structure ascended by a spiralling way. This inspired countless accounts, reproductions and narratives, the most famous of which was the Tower of Babel. This powerful image has taken on a life of its own, but the more measured opinion is that the ascent was by a triple stairway that wound its way up the sloping sides of each tier in a similar fashion to the Ziggurat of Dur-Sharrukin.[11]



Imagined biblical Tower of Babel.

A.

B.

C.

D.

E.

F.

G.

H.

I.

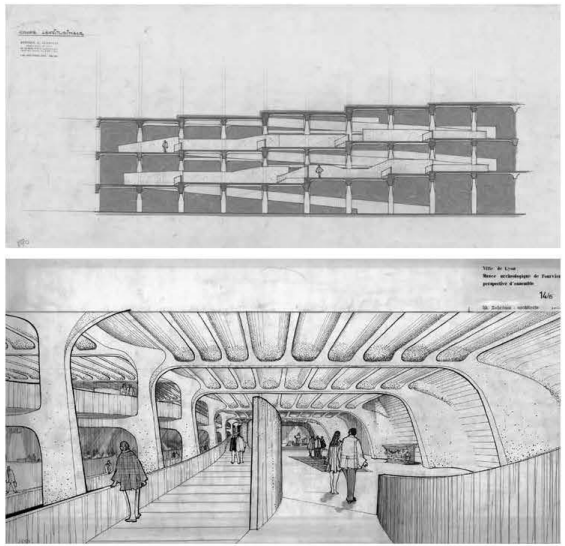
J.

A. *The Tower of Babel*, Cornelis Anthonisz, 1547.
B. *The Tower of Babel*, Pieter Bruegel the Elder, 1563.
C. *The Tower of Babel*, Lucas van Valckenborch, 1568.
D. *The Tower of Babel*, Abel Grimmer, 1585–1600.
E. *The Tower of Babel*, Tobias Verhaecht, 1585–1600.
F. *The Tower of Babel*, Lucas van Valckenborch, 1594.
G. *The Tower of Babel*, Marten van Valckenborch, 1595.
H. *The Tower of Babel*, Abel Grimmer, 1604.
I. *The Tower of Babel*, Jan Micker, 1650.
J. *The Tower of Babel*, Athanasius Kircher, 1679.

For two paintings depicting a rectangular version of the Tower of Babel see the project Katendrecht on page 951.

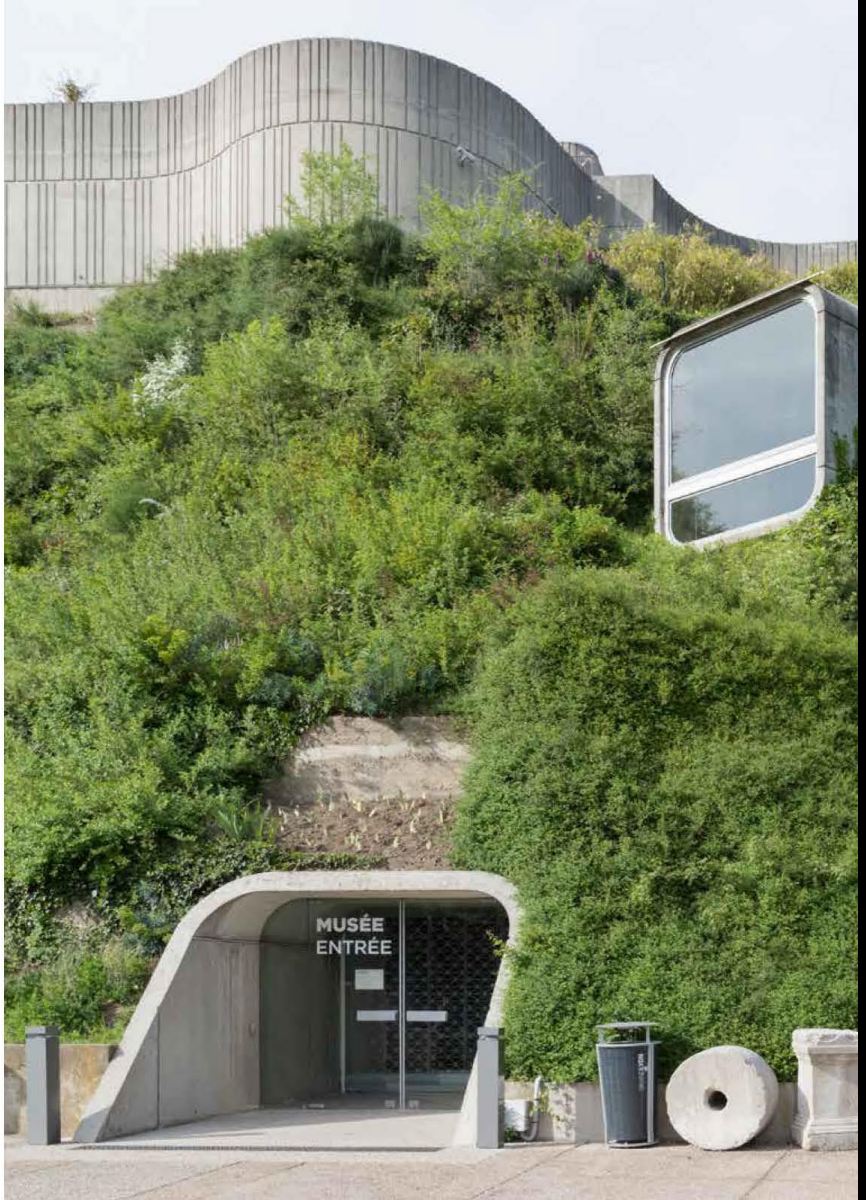
Likewise, the Musée Gallo-Romain respects the adjacent archaeological site by submerging itself into the hillside. In doing so, Zehrfuss had complete freedom over the interior. “I immediately thought that the underground structure could only be reinforced concrete. The knowledge of this method of construction allowed me, thanks to the flexibility of formwork, to imagine the creation of various forms and to find in the raw cement a material that could highlight the rich lapidary collection which was to be one of the main elements of the museum.”[32]

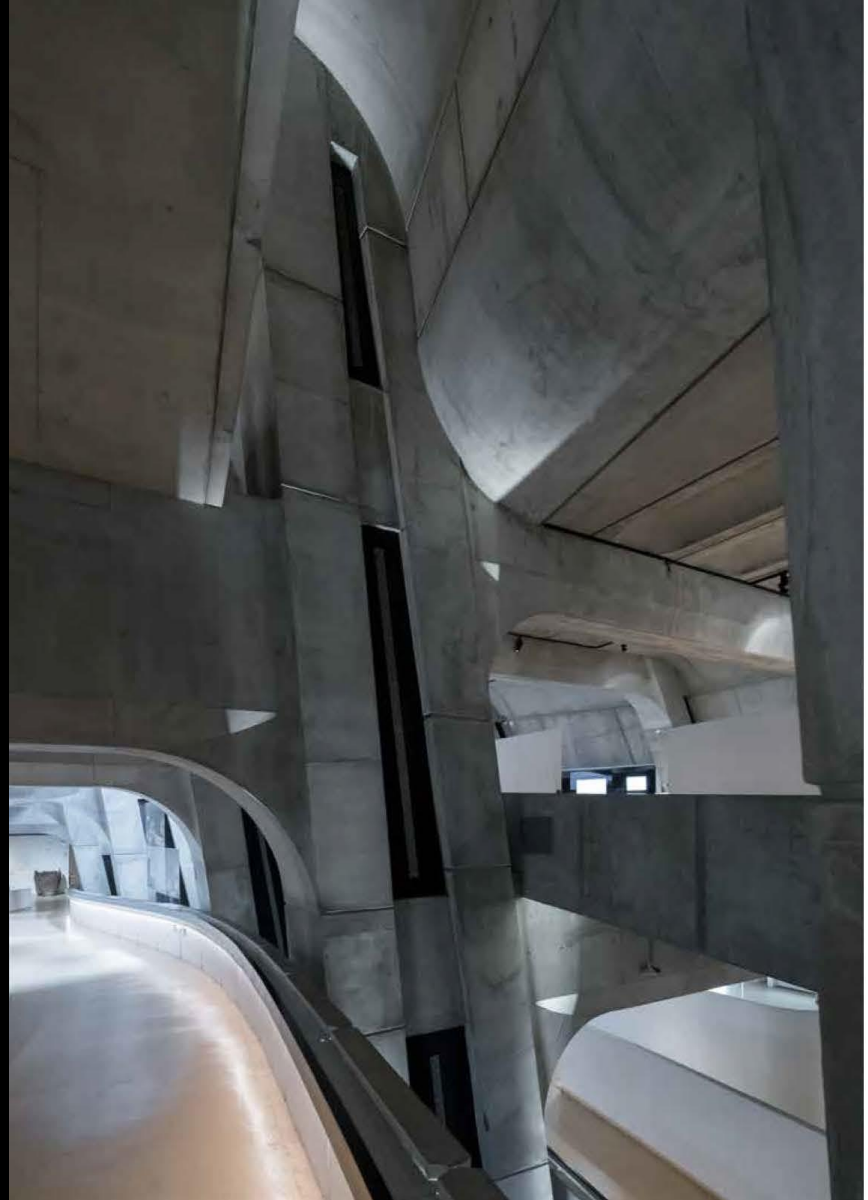
The main concept was to bury a Gothic cathedral with flying buttresses to show the power of retaining the hillside it is built against. The museum lies parallel to the hill, and is covered at the front by a rippling wall, broken only by bay windows that punch through the mantle of the earth.



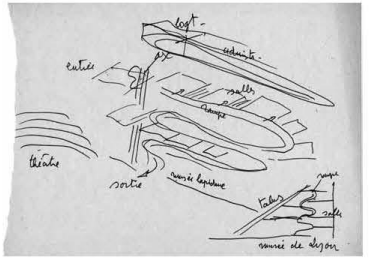
Original sketches, Bernard Zehrfuss, 1968.

The Musée Gallo-Romain’s paper clip–like spiral integrates programme, circulation and landscape. It is the pragmatic means of accommodating the museum’s weighty archaeological collection and the spatial organizing device of a descent down a slope. A gentle ramp leads the visitor downwards, following the chronology of the work within, to the exit at the base of two Roman amphitheatres.

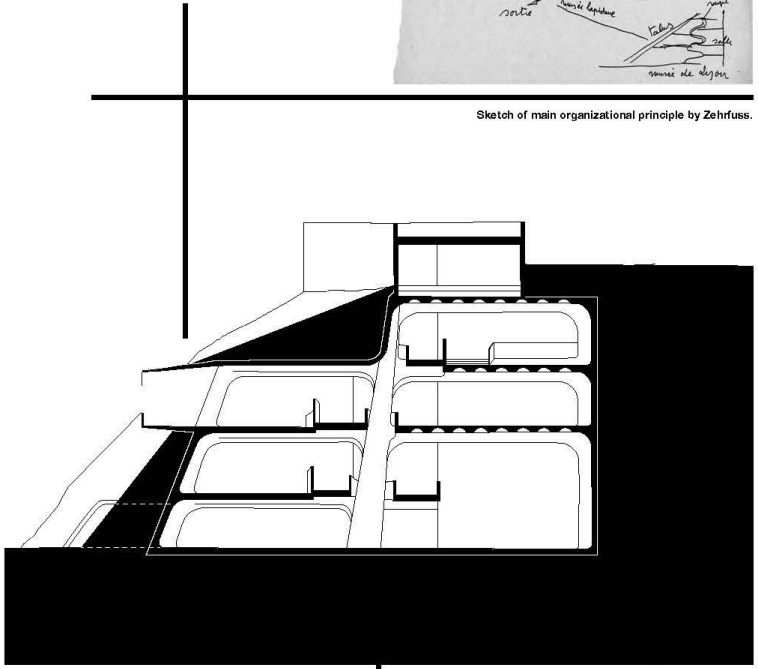




A *promenade spatiale* takes the form of a gently ramping descent bordered by terraced exhibition spaces. Space expands and contracts as you are guided through enormous porticos. An irregular structural grid and variation in the height of pillars generate long, short and framed views into the exhibition spaces. Viewing shafts penetrate the floor level and frame a view of mosaics laid out below.



Sketch of main organizational principle by Zehrfuss.



Short section of spiral ramp in Musée Gallo-Romain.

Building during construction and landscaping.

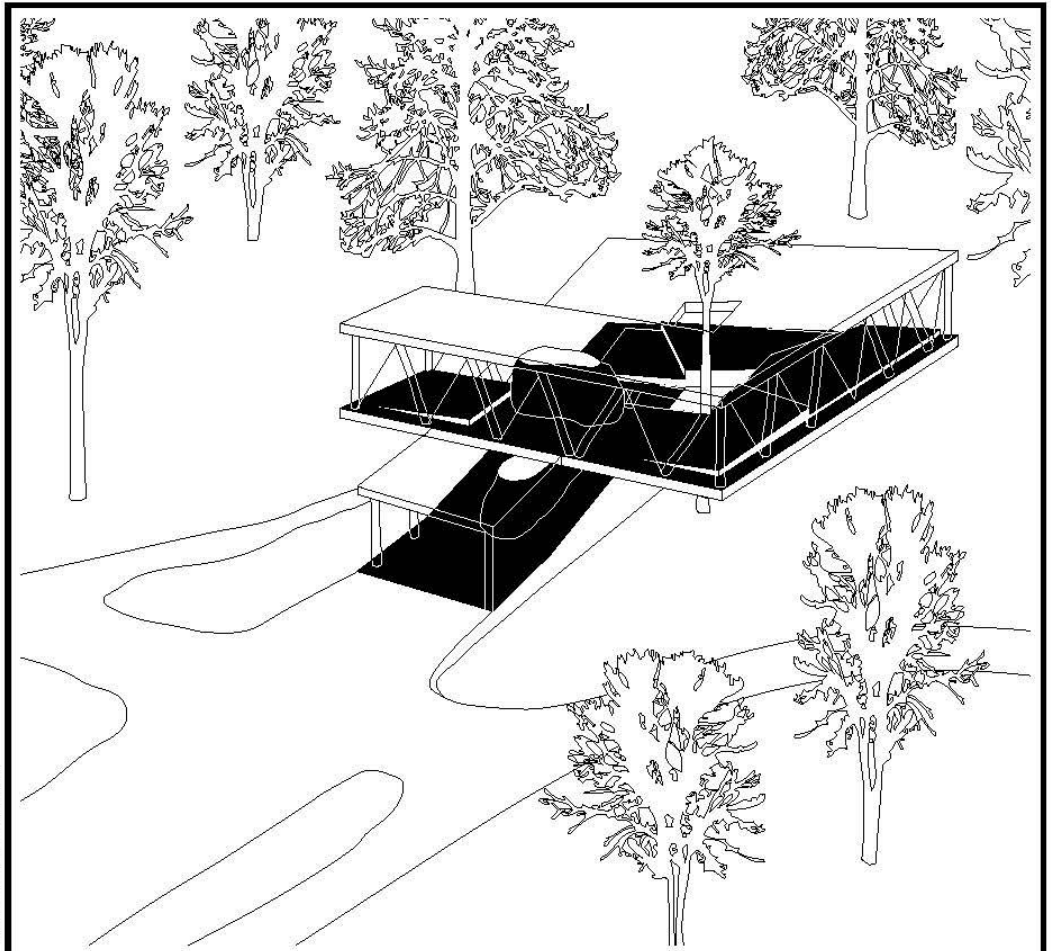
Posbank Pavilion
Rheden, Netherlands
SeARCH
1998–2002

The Netherlands has no mountains, so the rolling hills in the east are quite an attraction. During the last ice age, glaciers pushed sand up more than 100 metres above sea level (some achievement by Dutch standards). The deep-lying moraine was carried all the way from Scandinavia.

Kummakivi rock formation, **Ruokolahti, Finland,** accidentally created by the receding ice, 10000 **BCE.**

Hunebed D27, Borger, Netherlands, 4000–2000 BCE.

Kjeragbolten wedged in a mountain crevasse, Norway, 50000 **BCE.**

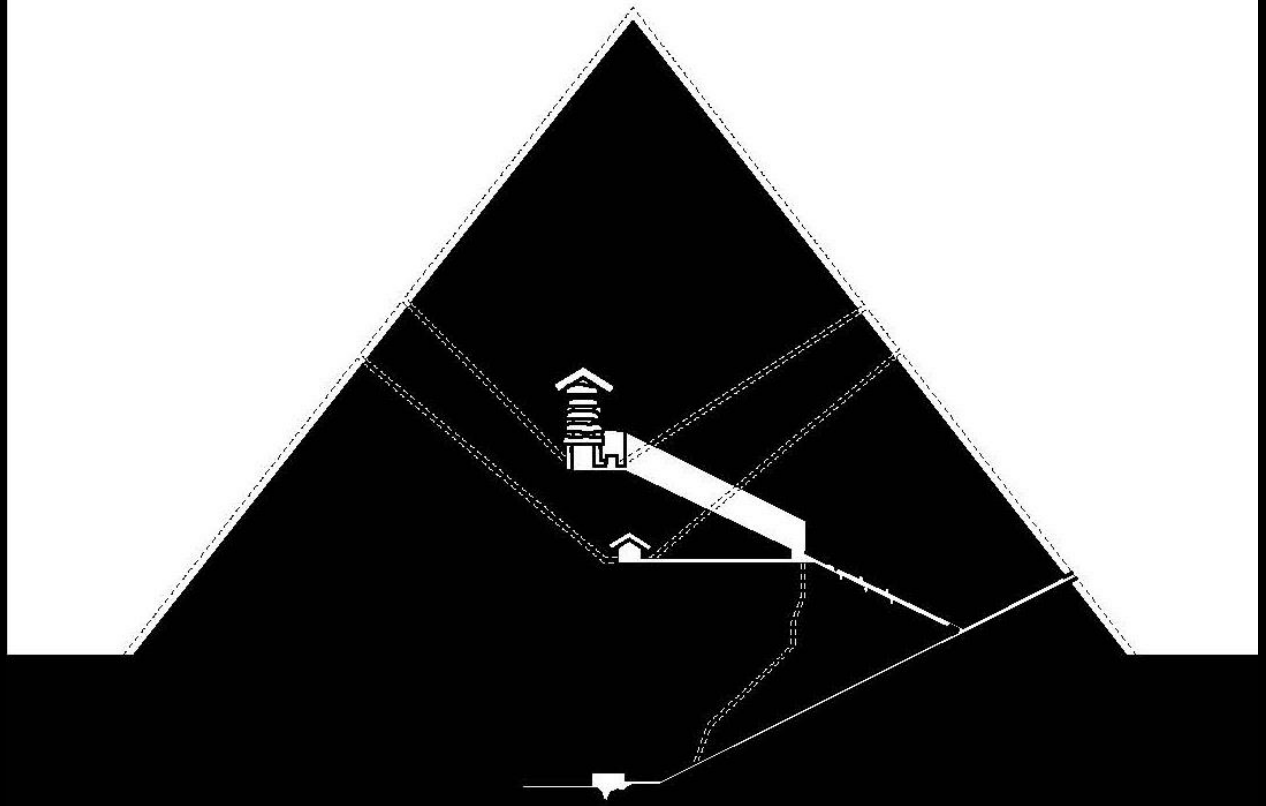


Axonometry of Posbank Pavilion.

These so-called 'erratics' (*errare* in Latin is 'to wander') are found further north in the Netherlands as tombstones. Erected in megalithic times, the Dutch *Hunebedden* are akin to the English dolmen. In Scandinavia, these perfectly balanced rock formations occurred naturally, the result of retracting ice as the earth warmed.


PAVILJOEN
DE POSB

carve



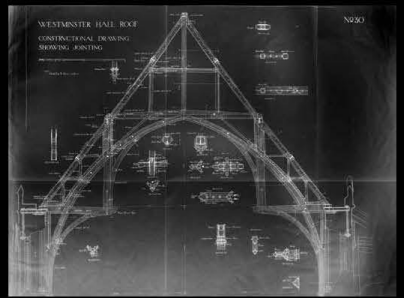
Saint Mark's Church, below Saint Samaan the Tanner Hall, Mokattam, 1993.

Likewise, a huge cave along the cliffs of Mokattam in Cairo was only rediscovered during groundwork in 1974. Coptic Christians saw this as a godly gift and excavated it, transforming it into a magnificent church, the largest in Africa. Its presence gave inhabitants, known as the *Zabbaleen* ('rubbish collectors of the Cairo megalopolis'), the reassurance to build more permanent houses. Today, 60 000 people live in conditions that are beyond belief, surrounded by piles of waste up to six metres high.[5] It is sobering to witness the stark contrast between the shadowy and spartan spaces in which people live and the grandeur of nearby places of worship.

Upper level of Saint Samaan the Tanner Hall, Mokattam.

The quest for large indoor spaces to inspire awe continued during the High and Late Middle Ages, but it wasn't until the Industrial Revolution that the game changed entirely. The hammerbeam roof of Westminster Hall and the flying buttresses of the Gothic cathedral can be seen as the first testing of these skeleton-like structures, as if society had a suspicion enormous spans could be achieved with trusses but lacked the material to carry it out.

Westminster Hall, London, 1097. The present-day roof was built in 1393. Drawn by Thomas Rowlandson and Augustus Pugin for R. Ackermann. *Microcosm of London*, 1808–1811.

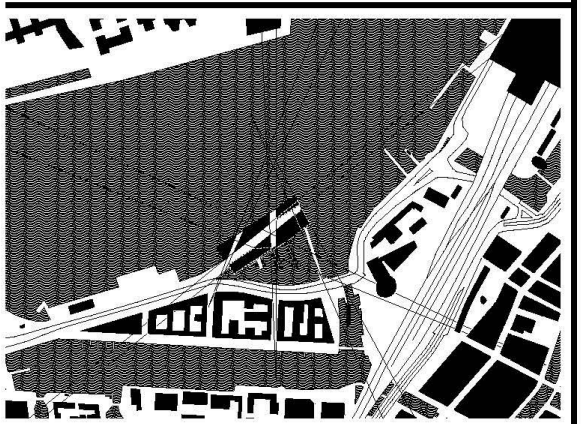


In 1923, Frank Baines of the Ministry of Works saved the roof of Westminster Hall by inserting steel trusses and largely relieving the medieval timber roof of its structural function.[6]

IJdock
Amsterdam, Netherlands
SeARCH
1999–2013

In the booming mid-1990s there was an ambitious plan to develop a multifunctional urban complex of 90 000 square metres on the southern quay of the IJ waterway, a short distance from Amsterdam Central Station. The brief called for underground parking for five hundred cars, a new Palace of Justice, a five-star hotel, apartments, a new office for the water police, commercial space and a new marina. In short, an enormous mass on a high-profile and highly visible site.

Site plan of IJdock.

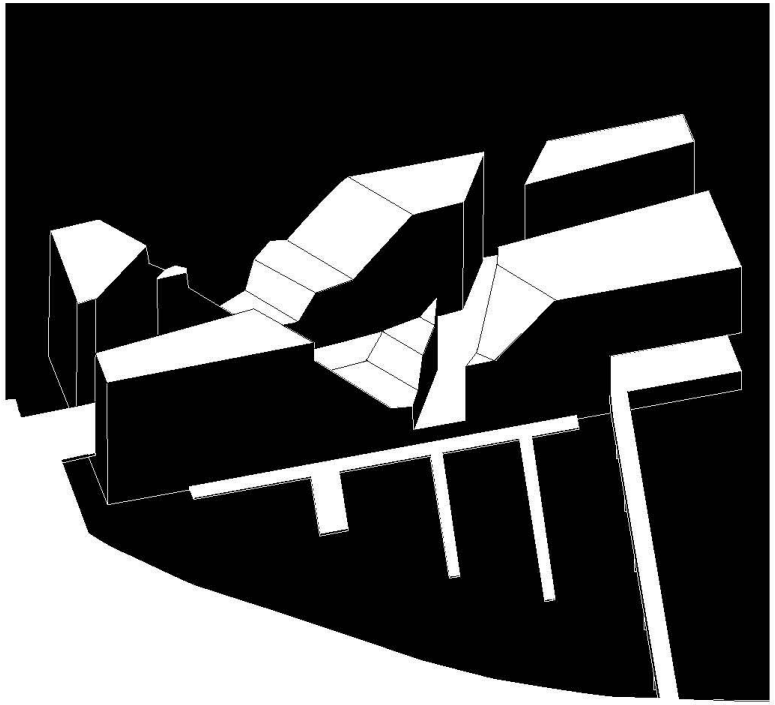


The unique form and skyline of IJdock was generated by carving out space to preserve view lines and connections between the seventeenth-century UNESCO world heritage canal district, the IJ, the western docks, the Central Station and the iconic Shell tower on the northern shore.

Mitre block, a woodworking tool.

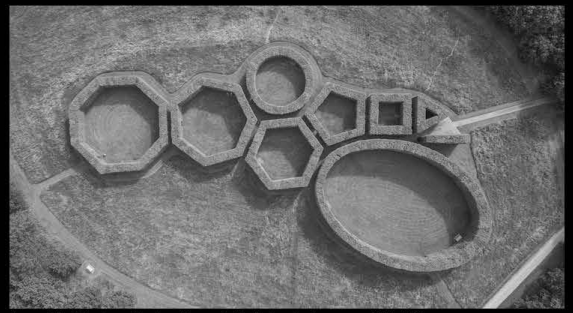
The resulting building came out of a process of 'reverse negotiation' with the twenty-six client bodies and external parties such as the 'Friends of the Inner City', who oppose most new initiatives on principle. But instead of creating a volume only to chip away at it with endless compromises, the making of IJdock considered the sound advice of Monty Python: *how to not be seen*.

Axonometry of IJdock.



mimic

A man vacuums his artificial lawn.

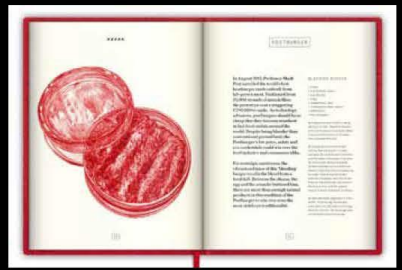


Geometrical Gardens, Herning, Denmark, Carl Theodor Serensen, 1963–1964.

We live in a strange yet exhilarating time when false dichotomies and past assumptions are being challenged. Nature is not the green stuff. Intensive agriculture removes biological competition to increase efficiency, creating a synthetic pasture. And the concrete jungle of the city is a living entity, an amazing collection of natural systems. Both the rolling pastoral landscapes and the junkspaces of big-box retail on the urban periphery are monocultures in their own right. Constructing landscape is a cultural act, and by studying how we make and remake our environment we can better understand humankind's position within it.[4]

Rich natural variation of an alpine meadow (left) versus monoculture of agricultural pasture (right).

The made and the born are fusing, and as Koert van Mensvoort argues we should embrace the fusion. Nature is not a static entity but a dynamic force that evolves with us.[5] This is a compelling thought, but unfortunately, the examples and experiments illustrated in his books are all style and no substance. To solve the issue of meat consumption, which has proven to be detrimental to the environment, ***The In Vitro Meat Cookbook*** grows meat in a lab rather than a field. Sounds good, until you realize there is no real negotiation with nature, no challenging of our cravings or changing of our culture. Human beings are trying to engineer nature, and not in a particularly clever fashion, as growing fake meat is typically done with serums made from animal blood.[6]



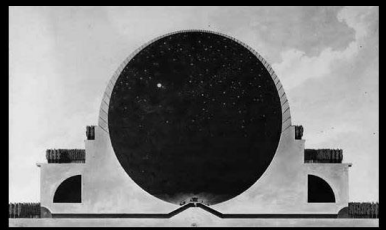
45 speculative recipes for lab-grown meat in *The In Vitro Meat Cookbook*.

Overstepping, Julie Rrap, 2001.

These ideas have a tongue-in-cheek Instagram appeal, because they mimic what we already have and already know. But since when did radical ideas rely on tired traditions and stereotypes?

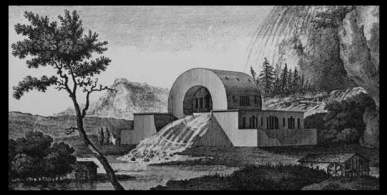
Interior of the Temple of Neptune, Giovanni Battista Piranesi, c.1777/78.

Giovanni Battista Piranesi shared the Grand Tourist fascination with antiquity, travelling to Rome to draw its treasures.[11] His etchings show a world beyond imagination. Architectural models, built and ruined, merge with the landscape. Natural and built elements are presented in equilibrium. Grand temples are overgrown, and classical columns stand like dead trees, under which cows and herders rest. His depictions of Rome in ruins, part real, part recreated, were an important source for the neoclassical revival in Europe.



Cenotaph for Newton, Étienne-Louis Boullée, 1784.

Although neoclassicists Claude-Nicolas Ledoux and Étienne-Louis Boullée experimented with natural phenomena and landscape elements, nature was subservient to strong classical architectural forms. Boullée interiorized the universe within the Cenotaph for Newton by perforating an enormous orb with constellations, and Ledoux imagined a river rushing directly through a house in his Ideal City. But in both cases, the building only lets in what it wishes, always in control of nature, and not at all willing to be overgrown like Piranesi's ruins.



Inspector's House at the Source of the Loue, Claude-Nicolas Ledoux, 1773–1779.

The introduction of cast iron during the same period ignited a revolution in building technology.[12] Cast-iron building components resembled Acanthus leaves and palm trees, mirroring classical orders, but since the dimensions were much slimmer, these elements merged into an airy fusion of construction and exotic floral abundancy. Henri Labrouste's library reading room looks like a palm grove with an infinite vista beyond the bookshelves, and Victor Horta's art nouveau houses transport you to a tropical world with their winding stairs and wallpapers full of abstractions of overgrown tendrils. At the dawn of the twentieth century, architects were still mimicking, replicating and romanticizing an image of nature rather than truly engaging with it.

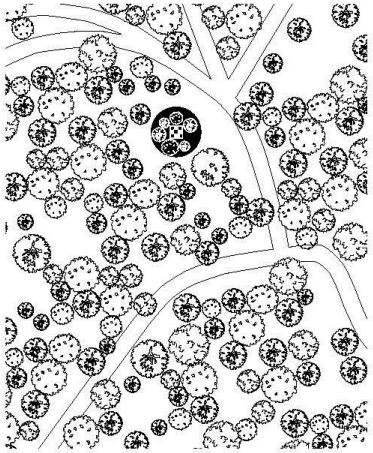
Reading room of the Bibliothèque Nationale Richelieu, Paris, Henri Labrouste, 1860.

Stairway of art nouveau–style Tassel House, Brussels, Victor Horta, 1892–1894.

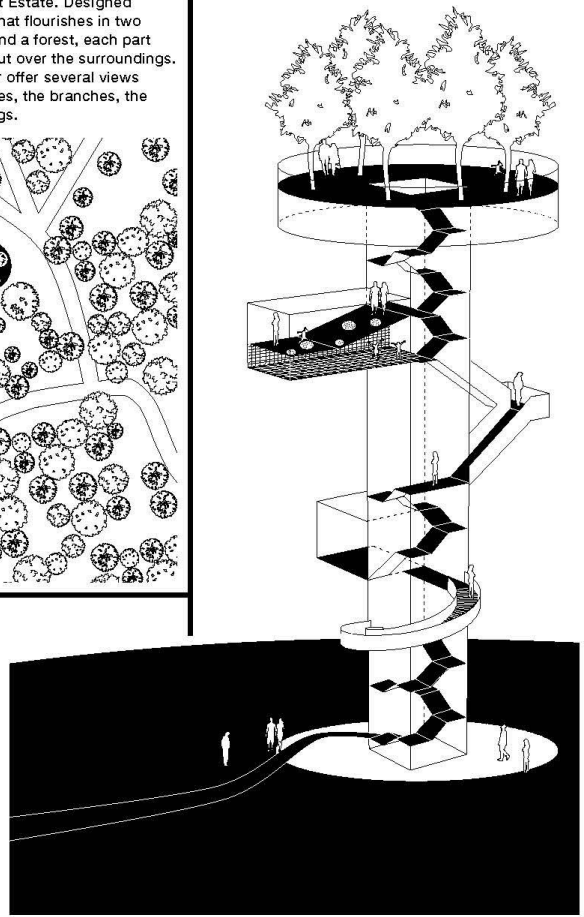
Candidates for Biosphere 2 project with test modules. The project was funded by Edward P. Bass, 1988

Forest Tower
Putten, Netherlands
SeARCH
2004–2009

The Forest Tower is a meandering vertical pathway through the Schovenhorst Estate. Designed around a species of tree that flourishes in two pinetums, an arboretum and a forest, each part of the promenade looks out over the surroundings. The branches of the tower offer several views along the route, of the skies, the branches, the ground, or the surroundings.

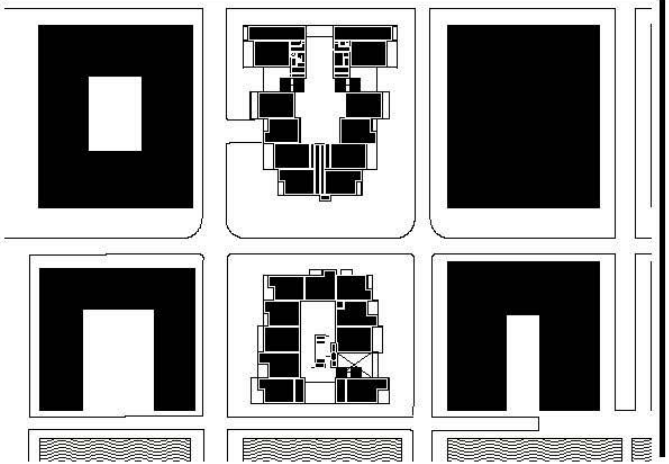


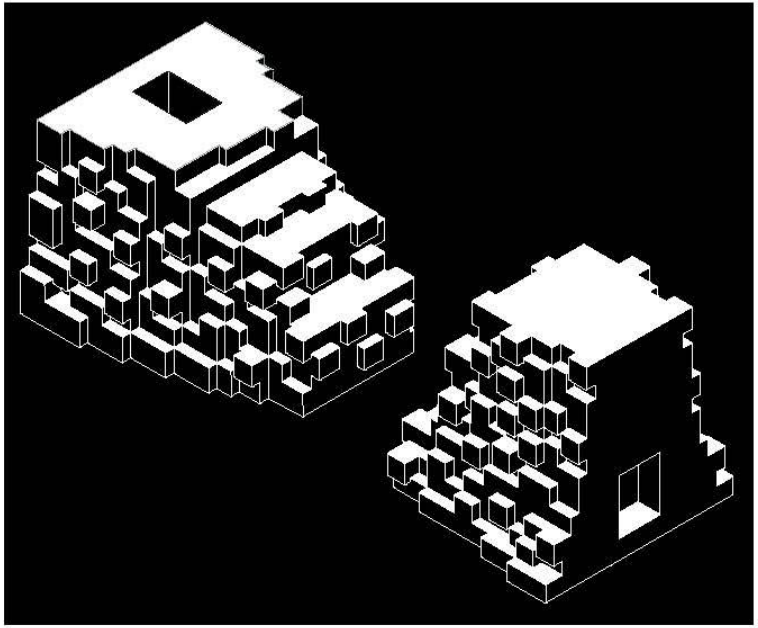
Site plan.



The Gershwin towers stand out among the phallic office towers of Amsterdam's Zuidas, or south axis. As a result of the financial crisis of 2007, housing has been injected into this business district, but instead of rethinking or reworking the urban blocks, most projects simply keep the tower typology, perhaps terracing it slightly.

Site plan of Gershwin.



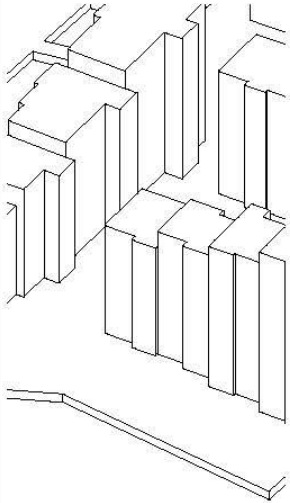


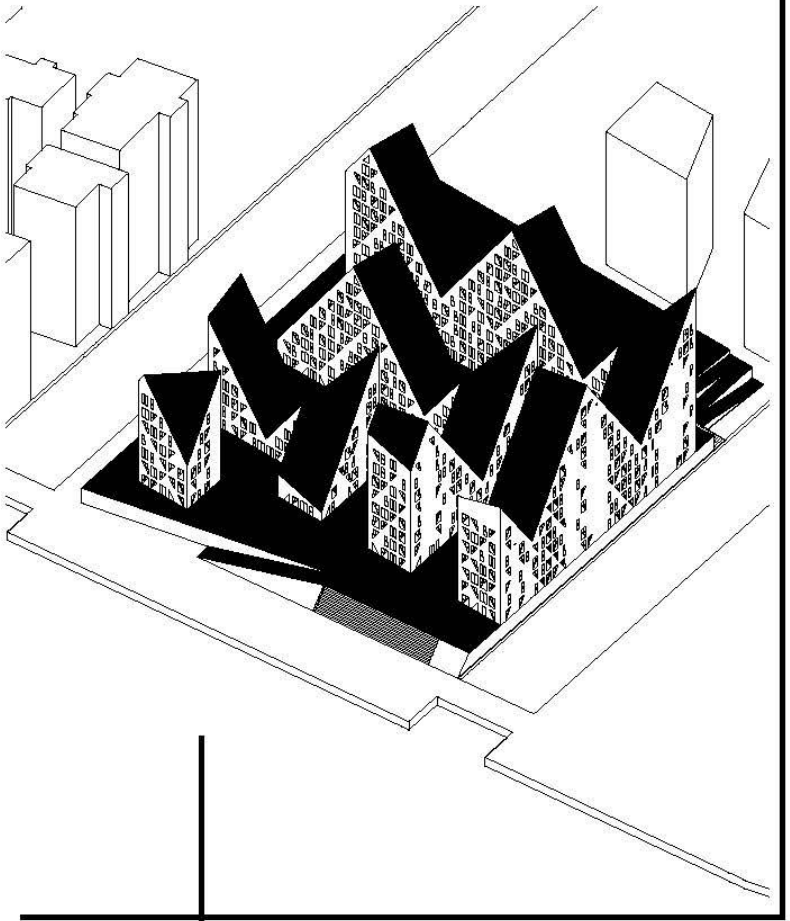
Axonometry of Gershwin.

By stacking and shifting apartments like three-dimensional pixels, SeARCH was able to maximize views, sunlight and privacy within a high-density urban environment. Small shifts in and out give the towers a surprisingly random look, while the overall building is based on an economical and regular building grid.

Isbjerget
Aarhus, Denmark
SeARCH + CEBRA + JDS
2008–2013

The stunning location on the Aarhus waterfront is the inspiration behind this archetypal architectural landscape design. The traditional housing block is segmented and shaved like an enormous block of ice to maximize sunlight and views of the water.





Axonometry of Isbjerget.

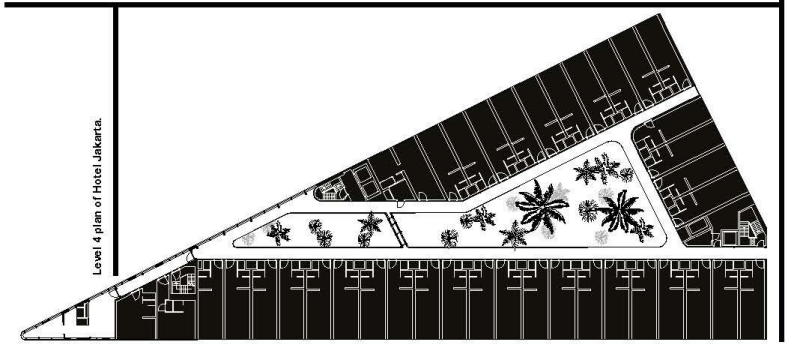
SeARCH, Cebra and JDS turned the typical Aarhus perimeter urban block with inner courtyard into L-shaped rows of housing that open up towards the water. The peaks and valleys of the volume maximize sunlight and views from almost every apartment. Mimicking the mesmerizing colour range you see when looking into the cavities of icebergs, balconies shift from bright blue at lower level to pale blue at the top.

Aerial view of Isbjerget.

Hortus Botanicus, one of the oldest in the world, was established in 1638 for the commercial exploitation of plants as a food source and research into their medicinal properties. From its conservatory, a single coffee plant became the parent of the entire coffee cultivation in Central and South America. This history is honoured by reinterpreting the Indonesian *Pasar Malam*, a small market for food and coffee, as a highly public ground surface in the hotel. Restaurants, bars, a bakery, a pool, a wellness centre and conference spaces are spread across an open plan ground floor. To manage the height difference between the upper street level by the bridge and the lower street level at the tip, the building's plinth is terraced into a series of paddy field–like levels, which step downwards so the building is accessible on all sides.

Botanical illustration of *Coffee arabica*.

Rendering of terraced ground floor.



Level 4 plan of Hotel Jakarta.

Hotel Jakarta dissolves the stuffy, dark European hotel into a light, airy frame that invites natural elements in and opens itself up to the neighbourhood around it.


HOTEL JAKARTA
OREADE