

Water Culture

Spatial Immersion in the bathing experience

Andrija Pantović



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Spatial Immersion in the bathing experience

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Abstract

The way a culture relates to the enjoyment portrays its relationship to psychological and physiological health of the society. Concepts and practices of leisure are inextricably linked, because leisure only manifests itself in its practice, but unlike other, bathing is tied to specific places and spaces. Through the broad, diverse and historically rich phenomenon of bathing, this work will try to investigate the emergence of spatial immersion. Within the activity itself lie hidden dimensions worth investigating, among which, at the very least, are rituals, microbes and urban planning. Water as a key element and a main human driving force, plays both an active and passive role in it. Active within the continuous obtaining technical and constructive knowledge from it, and passive by playing a substantial role in architecture and our perception of it. The inherent potential of water will be investigated through an architectonic scheme of a bathhouse in the urban context of Vienna.

Abstrakt

Wie sich eine Kultur auf den Vergnügen bezieht, stellt einen Zusammenhang mit der psychologischen und physiologischen Gesundheit der Gesellschaft dar. Konzepte und Praktiken der Muße sind untrennbar miteinander verbunden, denn Muße manifestiert sich nur in ihren Praktiken, doch im Gegensatz zu anderen Praktiken ist das Baden an bestimmte Orte und Räume gebunden. Anhand des breiten, vielfältigen und historisch reichen Phänomens des Badens wird in dieser Arbeit versucht, die Entstehung der räumlichen Immersion zu untersuchen. Innerhalb der Aktivität selbst verborgen sind Dimensionen, die es wert sind, untersucht zu werden, darunter zumindest Rituale, Mikroben und Stadtplanung. Wasser als Schlüsselement und Hauptantriebskraft des Menschen spielt dabei sowohl eine aktive als auch eine passive Rolle. Aktiv in der kontinuierlichen Gewinnung technischer und konstruktiver Erkenntnisse daraus und passiv in der maßgeblichen Rolle in der Architektur und unserer Wahrnehmung davon. Das inhärente Potenzial des Wasser wird anhand eines architektonischen Entwurfs eines Badehauses im städtischen Kontext Wiens untersucht.



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1

Enjoyment, as a mental state, can be seen as a surplus to a personal experience when engaging with a particular space or environment. This space of enjoyment is defined internally, through a set of physical properties of a specific place that allow the physical and psychological recreation to result in leisure. Experiences provided by spaces of leisure examine boundaries of both private and public, as well as the emergence of enjoyment as a spatial factor in architecture. Its specifics and needs can culturally differ, but generally they incorporate, without exception, the need for seclusion, privacy, sense of belonging or spirituality. Beyond the functional properties of the space, architecture can create an additional value by combining natural and architectonic elements or materials that stimulate other senses, thus enhancing the overall experience of leisure. Apart from the basic physical need for water, its role has always been indubitably linked to enjoyment. For these reasons, water has become an indispensable and desirable part of the architectural expression when we talk about spaces of enjoyment. First it should be clarified what a space of enjoyment is, and what elements it is made of. What comes to my mind is that it is a space where idle activities and daydreaming can unfold. However, in order to achieve that, among many individually relevant things, a certain degree of privacy and lack of outside pressure is needed as a base structure. Leisure is to be understood as a specific mental mode in which one can be both active and inactive, both mentally and physically, and here we will investigate on inactive modes of it.

Mindfulness is one of the essential elements to the experience of leisure, for leisure promotes mindfulness and vice versa. However, there is not a specific activity as such that counts as leisure, but an activity that is an end in itself, no matter what kind it is. What is important is

that the activity is characterised by freedom and does not happen under external pressure. Only then can this activity unfold in leisure, which is characterised by a special presence of contemplation. Consequently, leisure and contemplation enable a prominent form of knowledge that can have a logical, metaphysical as well as religious character. However, leisure is not exclusively related to philosophical/intellectual activity: it can also be of a profane nature.¹

Spaces of enjoyment can be seen as public spaces for social or individual retreats, such as libraries, museums, parks, villas. However, these spaces of urban retreat can offer us more of a mental stimulation rather than physical. One of the spaces of enjoyment that offers mentally and physically stimulating experience is tied to bathing, that in itself is tied to specific places and spaces. Since ancient times people had to go to these specific places with thermal springs, bathing houses or try to convert normal rooms into ones with bathing areas. In this respect, bathing has always represented an experience distinct from everyday activities. For once because it is completed in extensive exposure, and because it binds together mental and physical recreation. In this sense bathing means more than getting fit again for everyday life because it offers a special scope: it contains openness for intellectual or social exchange, for entertainment and games, and even for erotic experiences.

Although bathing spaces differ from other public retreats this does not mean that leisure can be only experienced in such places or that a place has to be specifically furnished in order to experience leisure. However, there are in-depth studies of the history of the culture and architecture for some of these rooms, such as Studio or the gallery. Others, such as loggia or the sanctuary have been dealt incompletely, or very neglectfully. Unfortunately the Bath is one of the latter, especially with regard to leisure. All of them have a common character that stands out from everyday living and working architecture. But the astonishing richness of bathing culture that is manifested throughout architectural history of the whole world and its density of the tradition within

¹Hubert W., Grebe A., Russo A., 2020, Otium, p.1-2

such spaces prove that that people have always taken their leisure into account by furnishing specific places and rooms in order to enable or promote leisure. This is a cultural-historically astonishingly consistent phenomenon, and its investigation is therefore particularly promising.²

Today's architecture of leisure, where enjoyment can be felt without pre-condition of consumption is rare. One of the rare spaces that do not require consumption, and allow at least contemplative moments are libraries and churches, cloisters as well. As Henri Lefebvre states in the book *Towards an Architecture of Enjoyment*, the roman baths remain for us an irreplaceable example of multifunctional architecture - **polymorphous and polyvalent**. Their variety of functionally different spaces, vast amount of outdoor spaces precisely allowed everyday recreation that still to this day has no worthy "opponent" that incorporates physical and mental enjoyment. The reason why there is "physical" and "mental" enjoyment is used to distinguish the two realms, as mental enjoyment in the form of leisure can take place independently of the space, whereas physical is attached to spatial properties of space and directs bodily movement from one point to another in order to adapt or find suitable temperature, view or social group. Problems that have accumulated from previous eras and new emerging problems that we are confronting are causing the whole economic, political as well as architectural systems to constantly change its course of development. They are simultaneously reflecting in almost all parts of our lives, through work, health, science or leisure. These systems are interrelated and inseparable in this era of raising awareness and consciousness about world resources. We are in the constant pursue of adapting our lives, making everything more efficient, reducing the emissions, improving our physical and mental condition. This pursuit is followed and supported by a second reality that we have constructed - the digital - an inevitable part of our every-day life and our constant source of new information.

The constant flow of connections and information in our consumerist society, though helpful, can take a toll on individuals. The more we consume it, the

²Ibid. p. 4

more we contribute to attention economies. With a lack of balance this can have a impoverishing impact on the mind and body, depriving it of its basic need - for recreation and leisure.

Do spaces of enjoyment exist, what is our relation toward enjoyment in the 21st century and do we need a justification for it? How can enjoyment be felt collectively, and does it change when experienced in a social context?

In the modern cities we are not only the consumers but are and actively consumed by millions of images through this digital reality, aiming mostly at our visual perception. In this constant exposure to visual advertisements, unspecific noises and sublime ideologies, our minds can get a sense of overload, not allowing us to think freely or address the needs of our body. Other senses are being slowly repressed, regarded as a personal matter. However, the city and everyday rituals are experienced with the whole body, and in a constant kinaesthesia, reading the information or the structure of the city with all senses, continuously at work within the mind and the body and therefore bathing occupies a special position among the spatial types because leisure here not only comes into play as mental relaxation and recovery from every day, but, also as haptic experience, involving all our senses. Extraordinary architectural experiences can isolate us from consciousness but still “remember” a variety of details. Sometimes, all it takes to trigger ones highly detailed memories of places or spaces is a sudden smell. While we bathe, we are experiencing most intimate moments, but yet when they are shared, they become even more intensive. This is due to bit

ambiguity in the experience. On the one hand we are at our most vulnerable moments when naked, and on the other hand we identify spaces where we can be naked as safe - home. Bathing structures can be seen as amplifiers of emotions, as well as the containers of them. A retreat from mundane routines, and enjoyment of others could result in a sensory, instead of digital stimulation. However, it should be emphasised that this work doesn't pursue an essentialist concept of bathing, but describes the phenomenon from different perspectives that marked historical eras.

What we currently experience in contemporary world is nothing unknown or new. The currently most popular, apparently the best solution to a problem, is being scaled and put into serial production so that every citizen has the same and "equal" access to that resource. Be it a door lock, solar collector, digital app, a garden or a bath. The frequent pandemics, unhygienic conditions of the foregone centuries in the cities and extreme industrial production with unregulated waste management resulted naturally in tendencies to provide this elementary human right to every dweller. A wide-range of offers marked the industrial era with patents of steam beds, foldable and portable bathrooms where everybody can take the bath wherever they want. This idea, even at that point was not new. The problem with this is that some of the activities are part of larger historical and cultural context and can't be extracted without jeopardising their value. Take the more recent example was the Viennese real estate market where the need for apartments with balconies in 2023 fell down 53%, and after two years returned to a pre-covid-pandemic level. This means that the whole market reacted extremely fast regarding world-wide quarantines and uncertainties on how long the pandemic would last.³ The mimicking of urban place was scaled, so that ideally everyone can have their own personal outdoor area. Henry Lefebvre argues that this provides an illusion of enjoyment, whereby "private" appropriation, in other words, the private ownership of space, is accompanied by the degradation of the real and social practice.⁴ However nice and elaborate the balcony can be, it can hardly substitute a walk through a baroque garden with sensational vistas, and although some of the

³ Redl, 2023, Der Standard; see bibliography

⁴ Lefebvre, 2014, p.5

above-mentioned patents make our lives incomparably easier, they take with it a big chunk of what used to be an every-day activity.

The role that bathing plays within a culture reveals the culture's attitude toward human relaxation. It is a measure of how far individual being is regarded as an indispensable part of community life. This is a social problem. Should society assume responsibility for guarding health and promoting well-being, or is it a private matter? Or should it regard its people as mere components of the production time, leaving them to their own devices as soon as they have finished work?⁵

The shared history of water cultures is a pendulum showing the degree of communal or individual character in a society. They portray ever-changing attitudes towards the concept of enjoyment, hygiene, power. Water as the most decisive factor was the core subject around which cultures evolved. In some places, especially in Southern Hemisphere, this was sometimes more challenging than in cold, mountainous areas rich with water. Water being the main driving force and key element for our body had to be secured in order to thrive in our first habitats. However, not being the only species that rely on water, and furthermore not having any defence mechanisms, horns or claws, we had to overcome the problem of safe shelter. Optimally this shelter would have had an unobstructed visual connection to the resources that we have found or acquired, and geographer Jay Appleton defined these two terms; **prospect and refuge**, as fundamental in the symbolism of environmental perception.⁶ Initially this would have been the edge of the forest or a grove, cave like space, but in time and with our ingenuity we evolved to build our tools and shelters to avoid more risks of inhabiting spaces of animal kingdom. For a consequence there are many ways in which cultures dealt with the problem of water consumption, and a wide array of solutions has been contributed, out of pure intuition and need. Still, even today we are naturally drawn to similar spaces, and we have an unobstructed history of built examples, ranging from Chinese gardens, European baroque and antique roman retreats, all elaborately integrating technical knowledge and specifics of a place and integrating nature

⁵ Giedion, 1970, p.628

⁶ Hildebrand, 1999, p.21

into its settings. Finding springs and aquifers and storing water for periods with poor rain conditions is an ancient problem dating far behind the 4th century B.C, but first coherent solutions - Qanat, "to dig" - came about in Persia, modern Iran, over 3000 years ago.⁷ Still, today we value and enjoy visible water elements so that the most luxurious and wanted real estate always offers vistas of rivers, seas. Even in the form of symbolic substitutes, the presence of water still impacts our mind and body. Studies by a psychologist Judi Heerwagen find that while people generally put striking natural scenes on their walls, those who work in windowless spaces do so much more consistently and predictably.⁸ It should be safe to presume that when we talk about how a society addressed and solved the questions or problems evolving around water, we are speaking of water cultures.

Water culture is a broad concept. First and foremost, because water is a naturally-occurring element employed by humans in innumerable artificial forms, water culture comprises the intersection of natural and artificial elements in society, the exchange between human and natural realms. Secondly, water culture is composed of the specific, and sometimes idiosyncratic, forms of water manipulation through which a society achieves seemingly limitless goals: hydration, agricultural irrigation, decoration, public and personal hygiene, hydraulic power, and so on. Finally, any given water culture will bear different social implications throughout all levels of a society. Water is omnipresent, and therefore, whether visible or invisible, impacts all aspects of culture writ large. Thus, water culture, defined simply yet succinctly, is the set of water-related practices that both express and shape a society's perception of its place within the natural order, in relation to foreign societies, and concerning its own constituent participants.⁹

⁷ Mays, 2010, Ancient water technologies, p.4.

⁸ Hildebrand G., 1999, p.16

⁹ Mays, 2010, Ancient water technologies, in Greek culture, hydraulic works in Ancient Greece are worth of mention. Already in 6th century B.C there written evidences of water supply, drainage, flood protection, sanitary facilities and water use for recreational purposes. The rising number of evidences and interest of scientists on re-evaluating them is nothing but promising, p.103



Fig. 1 The surrogate natural setting
© Judith Heerwagen

Storing water

As we mastered agriculture and started developing our culture, language we changed our mode of inhabiting places from a nomadic and sparsely populated places to concentrated villages and afterwards cities. Density in the cities caused cultural rises that have never been remarked such as in Roman Empire. It is believed that the city of Rome had 1 million inhabitants, so one of the biggest challenges was supplying water for all the dwellers. Needless to mention are successful aqueducts combining altogether around 804 kilometres from which 49 kilometres are masonry supported structures. It is estimated that aqueducts supplied about 1 million cubic meters of water per day.¹⁰ In order for the system of such scale at that time to function there had to be a proper storage, a cistern called castellum. One of the most awe-inspiring is the Piscina Mirabilis, near Naples in the Pozzuoli bay. It measures 72 by 27 meters and is 15m deep. It had a capacity of 12,600m³ which supplied many towns including Pompeii, Herculaneum, Acerra, Atella, Nola and others.¹¹ Although Vitruvius doesn't provide such elaborated hydraulic systems for water irrigations, drainage etc., the whole book VIII is about resolving problems around finding, supplying, distributing water to the cities and private residencies.

When it has reached the city, build a reservoir with a distribution tank in three compartments connected with the reservoir to receive the water, and let the reservoir have three pipes, one for each of the connecting tanks, so that when the water runs over from the tanks at the ends, it may run into the one between them.¹²

From the water reservoirs small lead pipes were used to distribute water further to public places or private residencies. These pipes had inscriptions embossed on their exterior indicating the manufacturer of the pipe, its subscriber, and how much water they were entitled to. By analysing these inscriptions, we understand that private access to the water supply had to be purchased and was regulated by authorities.

¹⁰ McFadden, 2016, The rise and fall of the Roman Aqueduct

¹¹ Mays, 2010, Ancient water technologies, p.123

¹² Morris, 1960, The ten books on architecture, book VIII, ch. VI

By analysing these inscriptions, we understand that private access to the water supply had to be purchased and was regulated by authorities. Citizens could buy a license to connect their property to an aqueduct, with the cost depending on the width of the pipe.¹³

¹³Ibennett, 2019, How Rome got its water

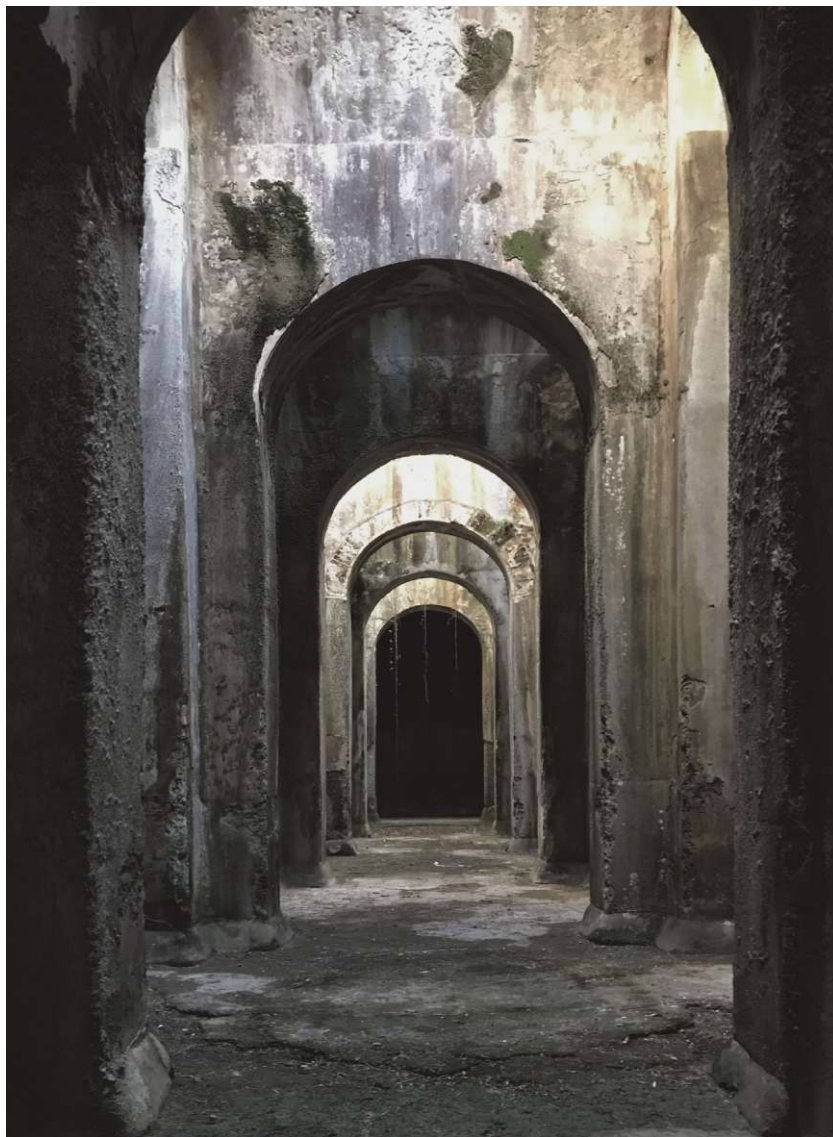


Fig. 2 Piscina Mirabilis

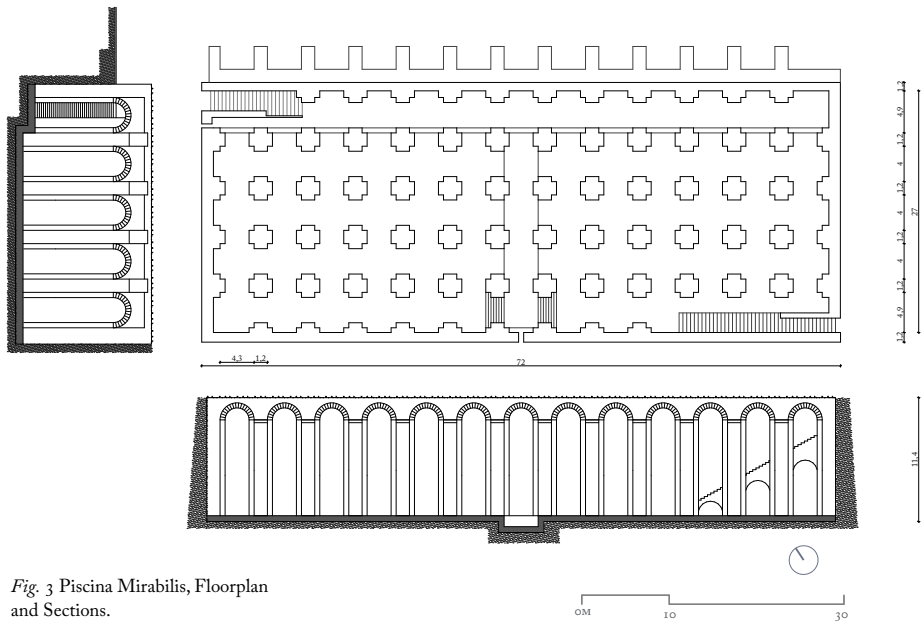


Fig. 3 Piscina Mirabilis, Floorplan and Sections.

Water towers

The need for storing water experienced its vertical development with water towers. This is crucial because it embodies a union of contradictions - of nature of water and architecture. On the one side water and its permanent state of horizontality and on the other, high rise structures that will, with all its technically necessary equipment, allow this state to be used in a different manner. Medieval customs, separated by centuries of Roman high water culture, went back to more basic ways of dealing with water storage, namely with water reservoirs, wells and cisterns, without building the imposing structures. Around 11th and 12th century, when cities started to flourish again and there was an increase in population density, the same problems emerged.

The later Middle Ages, th The later Middle Ages, that is roughly from A.D 1000 to the close of the fifteenth century, is the period of decisive development in the history of the effort to use the forces of nature mechanically for human purposes. With increasing speed a desire to harness the natural forces and use them for manual labour took over European castles and villages. Especially suitable were the mills on the riverbanks. At 1008 A.D a monastery in Milan mentions not only mills for grinding grain, but, adjacent to them along the streams, fullae, which were probably fulling mills.¹⁴

Tower is an archetypal analogy of the prospect.

As we were to that point even more distributed throughout the land, occupying land mostly with agricultural work there was a problem how to deliver water such long distances without it losing pressure. At this point, following the developments with water-mills, hill digging machines, water pumps the typology of water tower emerged. Historically speaking, there are several typologies regarding water towers: Water Pillars, Hydraulic towers, Pressure towers, Water Silos but I will concentrate on storage water towers.

¹⁴White, 1974, Medieval technology and social change, p.79-83

Their sole function was to use the force of gravity to generate pressure strong enough to pump the water to high points in the city. Early water towers consisted of tanks and wooden pipes laid under the pavements. Very seldom were pipes made out of clay or lead, and that caused them to break easily with every pressure surge that would happen. As the towers were usually placed outside of the city walls near river streams, they were prone to attack and had to be placed inside the city walls. To address the issue, water tanks were placed on the top of the structure that housed all needed machinery for it. Initially they were made of wood, copper and stone and the tanks themselves of wood, which could have transferred the foul odours to water as well. However, this typology developed during the history and was a part of cities around all western cultures. They usually mirrored the newest and most innovative language in architecture, rather formally.

Water culture (orig. Wasserkünste) from the Reichsstadt Augsburg were in the middle-ages and early new ages widely popular sightseeings and are protected with water towers as monument of buildings and technique.¹⁵

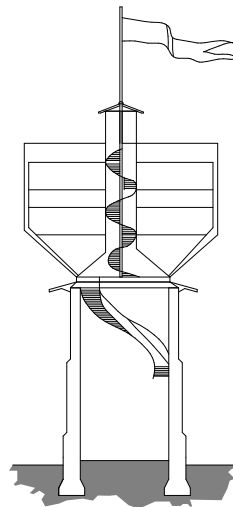
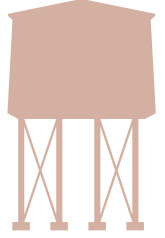
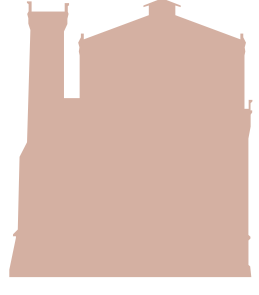
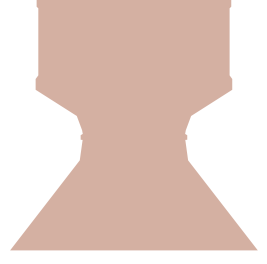
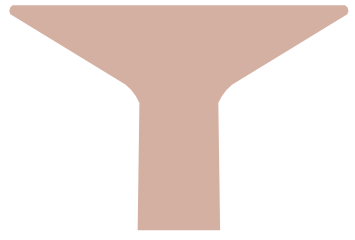
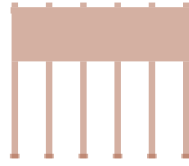
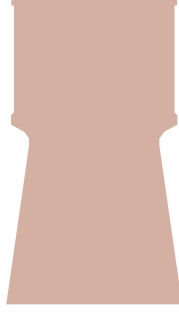
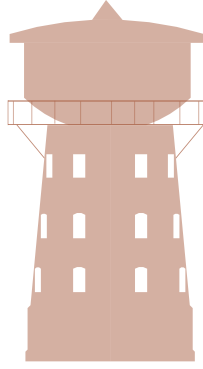
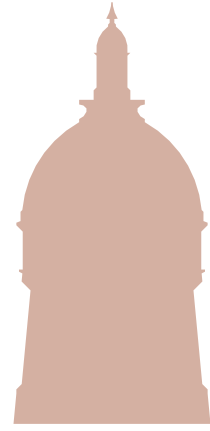
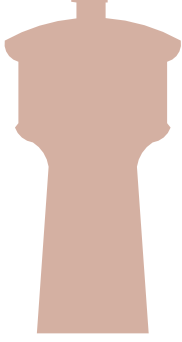
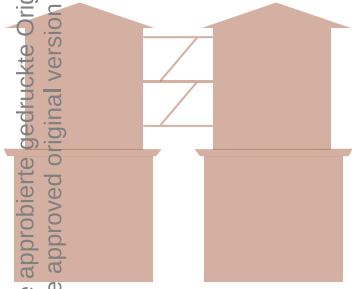
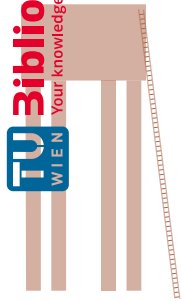
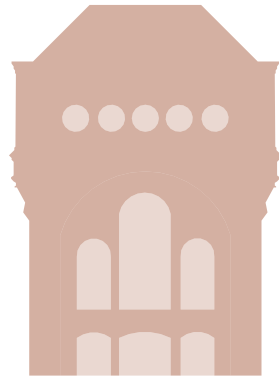
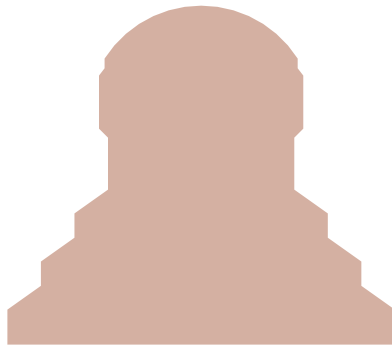
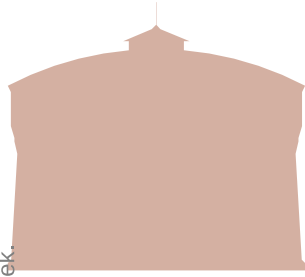
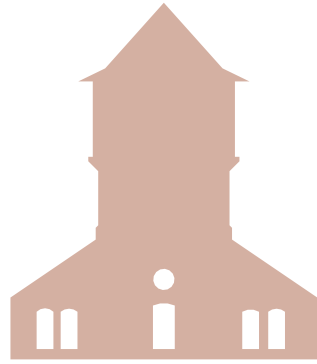
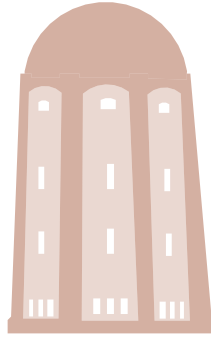
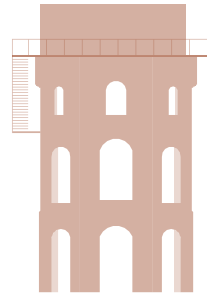
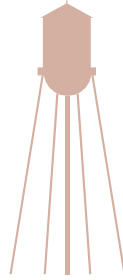
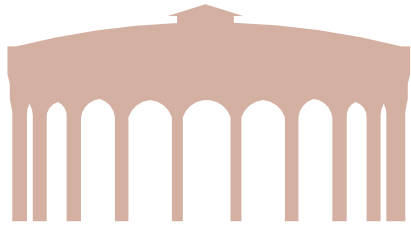
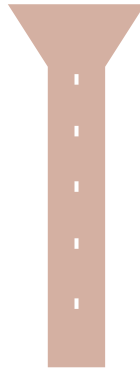
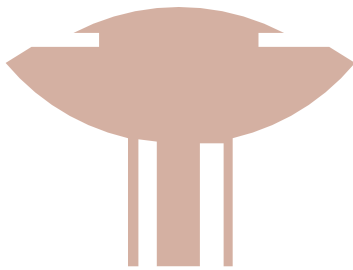
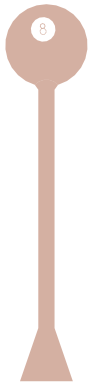


Fig. 4 Section of a medieval Water Tower

¹⁵ Ruckdeschel, 2004, Denkmale der Technik und Industrialisierung, p.9





The prototype of the water tower is a container held by pillars – the building form that results from technical necessity. The mixed construction, combined from stylistically done base, and not clad container resulted as a compromise that of tradition and economy. However, if strong supporting walls were needed, churches, castles and city gate were used as a model, whereas depending on taste, position or need, different building styles and elements were combined.¹⁶

In even more dense cities such as New York, this typology is still maintained as a practical solution to the problem of fresh water supply. Today there is an estimated number of 12.000-17.000 water towers that are in use in New York City. Although the maintenance cleaning and disinfection is required once per year, the responsibility for it is left to a landlord which can result in many forgotten tanks where layers of sediment and bacteria are contaminating water. Samples from 14 drinking water tanks in 12 residential buildings were analysed. Samples from eight of the tanks came back with positive results for total coliform. Five of those also came back positive for E. coli. A positive result for either sample means that the water is not fit for human consumption, according to state and federal standards.¹⁷ Water tanks are still an integral part one of the world famous skylines. Because of their simplicity, with little care and maintenance they can be used for long periods of time. However, when neglected, they can and will create conditions in which new kinds of bacteria will eventually grow and affect people's lives.

¹⁶ Becher Bernhard und Hilla: Die Architektur der Förder- und Wassertürme, München, 1971

¹⁷ Rivera R, Runyon G. F, Buettner R, 2014, Inside City's Water Tanks, Layers of Neglect



Fig. 5 Roofs of New York City in th 1950s
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Fig. 6 Rembrandt, c. 1654
A Woman bathing in the stream, Public domain

Early Medicine

Knowledge about water and its properties was already known during antiquity. The middle-age bathhouses gave rise to “Barbiere”, the successors of what we today call Surgeons and there are mentions that Saunas were often used as places where childbirth was done, because they were regarded as clean. Waters therapeutic properties, although known, were investigated more systematically and scientifically only with the enlightenment. Leisure, on the other hand, was disregarded due to many reasons. At least one of them was the effects of Counter-Reformation and Reformation (both 16th century) that both saw nakedness as a sin. The other could have been the influence of the Little Ice-Age that caused the temperature drop on average of 2 degrees Celsius between the 16th and 19th century. However, that Viennese people still enjoyed swimming in the unregulated arms of the Danube there is a testimony that swimming in it was forbidden three times over the course between 17th and 18th century. Either way, across Western and Northern Europe including Vienna, culture oriented itself more and more inwards, followed by raise in individuality. What was seen as a regular social intercourse in the middle-ages was unthinkable at the end of 18th century Vienna for these attitudes towards the needs of the body have found their way into society and slowly became prejudices.

A slow reappearing of regeneration was followed by the evolving medicine and rediscovery of nature. Voices from English, German and Dutch doctors that advocated for the benefits of bathing in combating health issues started to arise and Boerhaave, the Dutch doctor soon was seen as a father of hydrotherapy. However, all usage was strictly bound to medical treatments. This resulted in a new architectural typology seen in Paris in 1761 by J.R. Lucite, Bains de Poitevin sur Seine. This anchored ship provided single steam cabins and showers that were used exclusively upon doctors prescription. Everyone was together, yet separated by their own 4 walls. This shows that leisurely bathing is at that time still an unknown concept. Even the 1755 Great Encyclopaedia defined *douche* (shower) as a surgical term.¹⁸ Following the successful example of Paris, similar structures arose in European capitals. For Vienna, important person for

¹⁸ Giedion, 1970, p.655

the development of bathing was the doctor Pascal Joseph Ferro. His main idea was to spread the idea of cold baths among citizens and so on 13th of May 1781 he opened the first Ferro bath at the Danube river near the Augarten. One of the specialties of the Ferro bath was “Stürz” and it was described as follows:

Über der Mitte des Bades hängt von oben herab ein Seil, was bis zum Wasser reicht, und unten in eine Schlinge umgebunden ist. Etwa drei Schuhe von dem herabhängenden Ende des Seils ist ein anderes festgebunden, das zwei bis drei Klafter lang ist. Der entkleidete Stürzende stellt sich an dem einen schmalen Theil des Bades der Stiege gegenüber, nimmt das hängende Seil in seine Hände, und hält es in der Schlinge fest. Ein Bedienter nimmt indessen das daran festgemachte Seil, und stellt sich an das andere schmale Ende des Bades dem Stürzenden gegenüber; dieser biegt nun seinen Körper allgemach vorwärts, senkt seinen Kopf zwischen seine Arme, die beständig das Seil festhalten, herunter, und fällt so mit dem Kopf herab ins Wasser. Das Seil, woran er sich immer festhält, zieht ihn schon von selbst in die Mitte des Bades, wo ihn dann der Bediente, indem er nun mit seinem Seil anzieht, zur entgegengesetzten Seite aufwärts zur Stiege leitet, worauf er dann sogleich aus dem Wasser geht. Das ganze dauert kaum eine Viertelminute. Dieses Stürzen wird ein-, Zwei-, auch dreimal wiederholt, nach Verschiedenheit der Stärke, Gewohnheit und Lust des Badenden.¹⁹

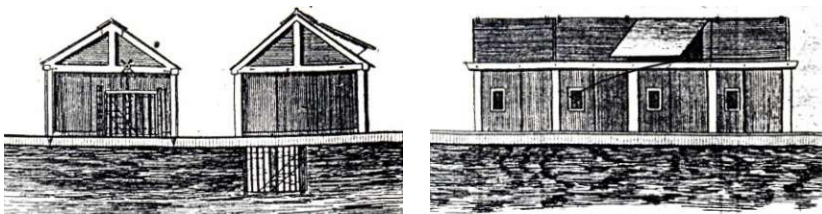


Fig. 7 Paskal Joseph-Ferro:
Illustrations and a part of the
title page from “Vom Gebrauch
des kalten Bades”, 1790

¹⁹ Europa Verlag, 1987, Baden und Bäder in Wien, p.21

Individualisation

The passive practice of leisure in bathhouses known up until the enlightenment was put aside, while active practices such as swimming took over as a necessary activity for every citizen. Heating halls big enough for citizens in cities such as Vienna was something unthinkable, as the antique hypocausts were long forgotten. This, combined with fearfulness about nudity, led to a need to supply everyone with scaled essential part of infrastructure. Naturally, in the century of inventions and mass productions this resulted in a multitude of patents that tried to solve the challenge and use water and its curative properties. The main idea is that each individual can use the product for their convenience, and with that the problems of stomach maladies could be resolved. Here for the first time we have a successful scaling of the public practice into a fragment that is used individually. During the last decades of the 19th, gymnastics, jumping, swimming became compulsory school subjects. The idea that relationship between mind and the body ought to be maintained in order to be healthy started to grow. The attitudes of Enlightenment were slowly introduced to educational system and gained their own form. For six hours of class instruction, there were three hours of physical activity, and two of manual training.²⁰ Rousseau's 'return to nature' appears in the hardening cold washing, cool sleeping, early rising, and, in summer, 'living under canvas'. At the beginning of the 19th century Gymnastics were already developed in many countries but were all practiced for militaristic discipline reasons.

Having mastered steam locomotives in 1804, it is natural that modern societies possessing the know-how tried to apply the knowledge further. At the end of the century there was already a variety of portable or foldable bath cubicles that produced steam. The Montgomery Ward in 1894-5 had a catalogue of baths with heaters that can fit into a wardrobe ranging from \$20 to \$60.²¹

²⁰ Giedion, 1970, p.656

²¹ Ibid. p.666

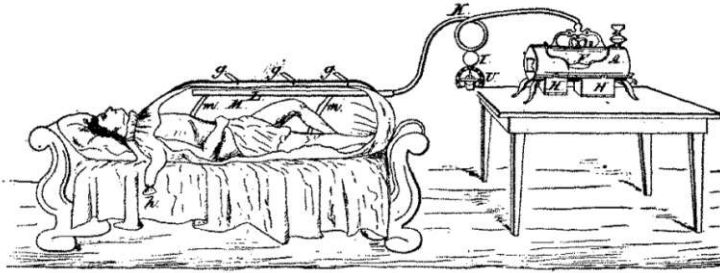


Fig. 8 Steam-Bath Apparatus in 1855, A bag channels the steam around the bather's body. 'The open end may be closed around the neck of the patient by means of tightening a cord strung in its edge.' Giedion, 1970

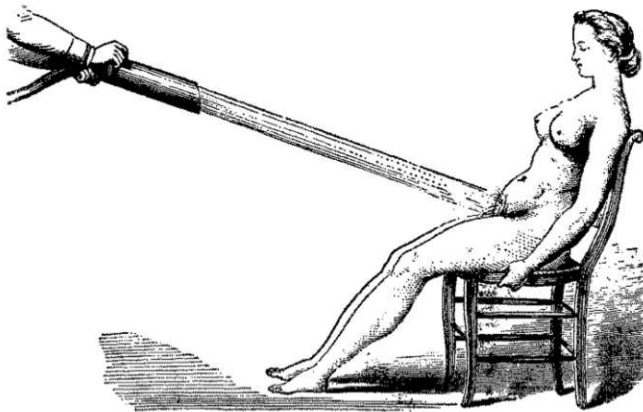


Fig. 9 Giedion, 1970, Shower for the Treatment of Abdominal Maladies, France, c.1860. In France of the 'fifties and 'sixties Priessnitz's hydropathic methods were refined and apparatus was developed for increasingly specialized medical purposes. (L. Fleury, *Traité thérapeutique*)



Fig. 10 Back to Nature: Priessnitz's Shower in the Silesian Woods. A source is captured and channeled through pipes open to the sun. The shower is taken on a wooden platform built out over the stream. Half a century after Rousseau's Back to Nature, the romantic outlook helped to win acceptance for the water therapy of Priessnitz and others. (Philo vom Walde, Vincenz Priessnitz, Prague, 1884), Giedion, 1970

Hydropathy and bodily regeneration gained importance in the Germanic area with Vincenz Priessnitz (1799-1851) who, although not attending any higher academic institution claimed that his prescriptions cured modern maladies in the middle of the woods near Graefenberg. The therapy consisted of various ways of using water throughout the day, beginning early in the morning with covering guests in damp towels, to cold ablutions under the small waterfall and drinking plenitude of water. His idea was that the body by default strives towards health, and with water all foreign, unhealthy matter should be eradicated. In 1829, he began with 45 patients. In 1843 he had over 1500 guests and a fortune of £50,000, which would have a purchasing power of £8,127,817.55 today.²²

²² Ibid. p.662, Amount converted through Officialdata.org, Inflation calculator

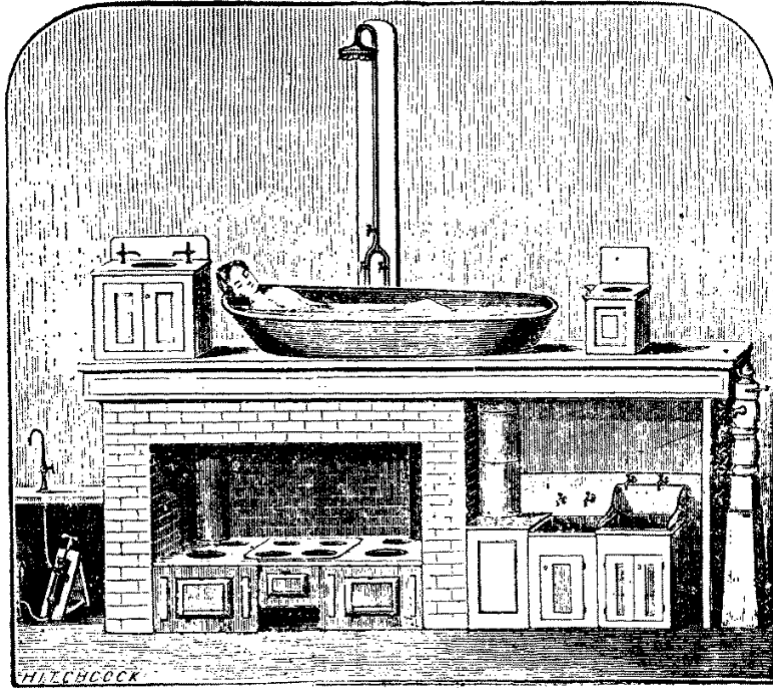


Fig. 11 Plumber's Advertisement, Boston 1850 ,
Giedion 1970

Cholera

From the first function to supply the castles and villages with running water, with the rise of industrial revolution water tanks expanded their use. They were used as secondary objects near train stations for the goal of supplying the locomotives with sufficient amounts of water in order to operate properly. With this, storing the water changed its position in the city, and again, right in the centre of the newest innovations. However, extreme living conditions in the cities began taking its toll. Driven by industrial revolution, steam engines accelerated among many things the life in the cities, which made things not necessarily better. In comparison to middle-ages cities were far more polluted than before. There were immense quantities of waste that were not properly disposed. Usually in agricultural middle-ages every type of waste could find its purpose again. With this rapid development of industry cholera outbreaks that were rampant in the Europe showed again the problem of clean water supply and that drastic measures had to be taken.

*“Asiatic cholera”, as it was sometimes called, has been endemic in south Asia, especially the Ganges delta region, from the time of recorded history. Until the 1830 4th cholera pandemic reached Europe and left their mark by taking 165,000 lives in Austrian Empire, 30,000 each in Hungary and Belgium, 115,000 in Germany, 90.000 in Russia. The fifth pandemic claimed 250,000 lives in Europe, 120,000 in Spain.*²³

Contrary to today’s belief, in the height of industrial revolution it was believed that the reason of so many deaths is the Miasma - bad city odour - that roamed the cities at night. This thought is today easily overlooked, but it withholds an important association of the brain with bad odours. Here again we could investigate on how different cultures attitude is towards e.g. fish sauce, but important thing we can learn from evolutionary biologists is that an understanding of the relationship between putrid odours and disease is ancient and wired into our subconscious brains.²⁴

In the middle of the century John Snow from London tried to pose a different

²³ History of Cholera, public see bibliography

²⁴ Dunn, 2018, Never Home Alone, p.88

opinion to what had been causing so many deaths, especially in London's Broad Street, now Broadwick Street. His idea was that rather than the smell, the problem was in water itself and the transmission as well is not through air but through water that had been infected with human feces. In order to investigate it, he created a map of the neighbourhood and its main water pump people had been using. Pump is represented with a circle while each slash by the "house number" represents individual death in the building. After the handle was removed from the pump, the sudden and rapid deaths reduced, but soon afterwards it turned out that the well was contaminated with a baby diaper that proved him correct. However, this was first acknowledged after 100 years, with a first microscopic picture of bacteria *Vibrio Cholerae* made by Robert Koch in 1884.

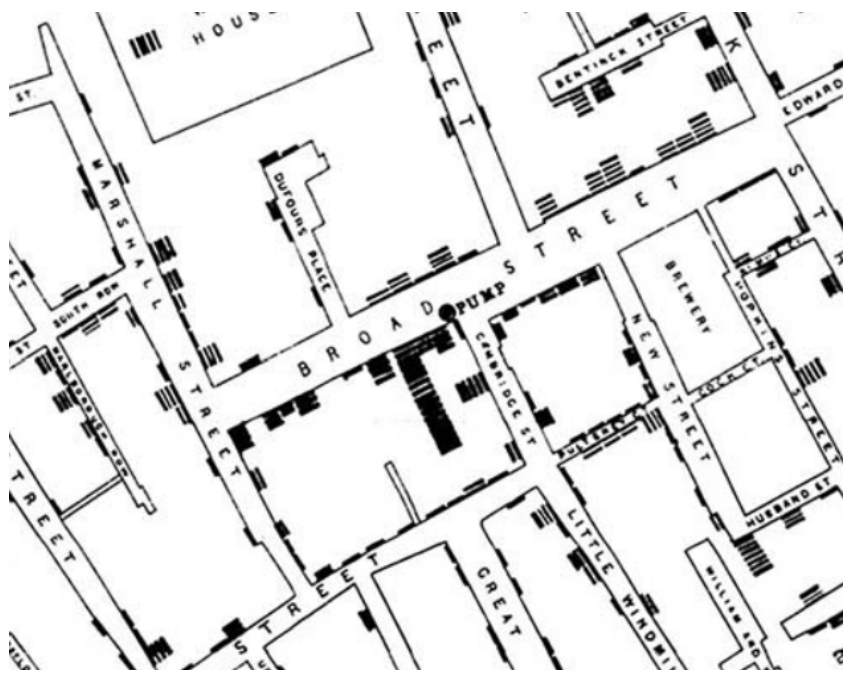


Fig. 12 Johnson, Steven, The ghost map, Riverhead Books, 2006

Beside frequent flooding, polluted water was an important decision maker during the 18th and 19th century Vienna. While the consequences of the flooding were visible and thus repairable, the invisible world of bacteria living in water was unknown. With the beginning of enlightenment and development in natural sciences, Antoni van Leeuwenhoek (1632 - 1723) developed the first microscope that could make single bacteria visible.²⁵ Cholera was present in Vienna during the whole 19th century, coming in six waves, taking on average 3,200 lives or approximate 0,8 % of the inhabitants. After the first wave arrived in Vienna, imperial crown decided to build a sanitary cordon on the border with Hungarian empire, following the example of cordons built in Pest during the Osman siege of Belgrade in 1739.²⁶ After the second wave, it was clear that this measure wasn't effective, resulting in separation of opinions about the cause of the disease into two branches. First being the old belief that the bad city odour - Miasma is causing it, and the second, aiming at the theory of contagious bacteria, the same that John Snow in London proposed.



Fig. 13 Miasma, Wasser Stadt Wien, The cause of cholera was initially assumed to be foul-smelling fumes. This is also suggested by this personification of cholera in a depiction by Robert Seymour from 1831.

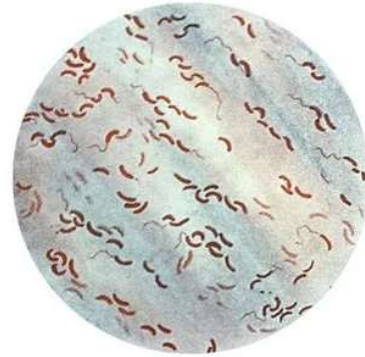


Fig. 14 *Vibrio cholerae* under Microscope

²⁵ Zentrum für Umweltgeschichte, 2019, Wasser Stadt Wien p.183

²⁶ Ibid. p.187-188

*Christopher Hamlin has very impressively described the problem of reducing the phenomenon of urban cholera and its effects on a bacterium. For him, cholera is not just an evolving pathogen but a combination of ideology, political structures, class relations, systems of food, water and sanitation, and even changing environment and climate. Cholera as a composite is more than an opportunity for surveillance or a stimulus for the reforms that are almost inevitable because of it. Cholera, he notes, is a historical actor.*²⁷

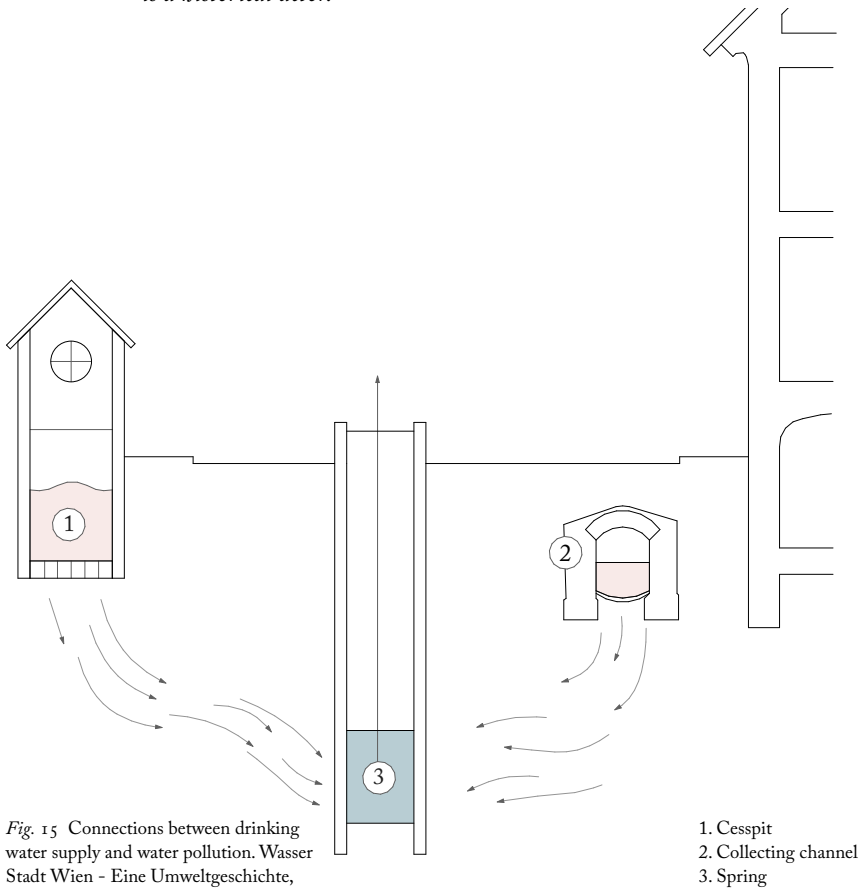


Fig. 15 Connections between drinking water supply and water pollution. Wasser Stadt Wien - Eine Umweltgeschichte, 2019

²⁷ Ibid. p.188

Absence & Presence

In the middle of the 19th century emperor Kaiser Ferdinand the first ordered a new water supply facility that transported clean drinking water for all citizens of Vienna from Rax, and Schneeberg, around 100KM southwest from Vienna. Besides the Danube regulation this was one of the most challenging projects in 19th century Vienna, and up to date there are only positive remarks to be heard as the quality of water is undisputed. It consists of many aqueducts and canals that are built underground and out of stone, resulting in mostly unchanged temperature from the beginning to the tap water in the apartment all year round. The system reaches the southwest part of Vienna into several reservoirs at Laaer Berg, Wienerberg, Schmelz, Rosenhügel from where it is directed further to the city of Vienna for public use. With this measure, cities started regaining hygiene and slowed down drastic outbreaks of diseases transmitted through water. This idea was mirrored through every aspect of the life. Everything that is not “clean” was regarded as potentially dangerous, and that is not surprising, given the background problems the time had to deal with. Architecture experienced major changes because of these changes. We have the break from the tradition, historical forms that were identified with hypocritical times when everything only seemed to work. The facades and homes of 20th century are radicalised, *clean*, with no ornaments, easy to maintain so that the germs are kept at bay, outside of our homes. This widely accepted, and still up to this day practice has shown some effect on our health as well. Finnish epidemiologist, Tari Haahtela had a fresh new perspective on why there was an increase in inflammatory diseases since the 1950 in all urbanely developed countries.

Haahtela thought that people were getting sick because of their failure to be exposed to species they needed. He didn't know which species those might be any more than Snow knew which contaminant in the well caused cholera.²⁸

²⁸ Dunn, 2018, Never Home Alone, p.97

He already tested this idea in wild nature and places in Finland where diversity of butterflies was declining but chronic diseases were inclining.

Following on these hypotheses a number of scientists analysed and tested it in the work of “*Significant Disparities in Allergy Prevalence and Microbiota between the Young People in Finnish and Russian Karelia*”. The results ran on the course of 10 years showed asthma, hay fever, atopic eczema, self-reported rhinitis, as well as atopic sensitisation, were threefold to 10-fold more common in Finland, as compared to Russian Karelia. Hay fever and peanut sensitisation were almost non-existent in Russia. Main reason for this disparity is the way of living of the above mentioned dwellers. While Finnish people lived in the developed neighbourhoods, with pipeline water and air conditions, Russian people lived in undeveloped houses, often very near to the barns and sheds where they kept cattle and drink well water and harvesting their own vegetables. Hanski and L. Von Hertzen concluded in the Environmental Biodiversity, *Human Microbiota, and Allergy are Interrelated*, that the exposure to soil and bacteria from it is ultimately the main reason why teens living in such diversity rich houses had a higher number of skin bacteria that reduced risk of allergies.

“clean.” In the late 1800s in the Netherlands or London, clean meant that the water didn’t smell, and when you used it, along with soap, on your body, neither did you. Once it was discovered that pathogens such as Vibrio cholerae caused disease, clean meant that water lacked these pathogens (or at least that such pathogens were rare). Later, clean would also come to mean free of dangerous concentrations of particular toxins. What clean has never meant, and will never mean, is sterile.²⁹

The groundwater is usually stored in the natural aquifers, and in order for water to get to them, it needs to go through porous sediment soil and travel very slowly, meaning that when we find a spring, we are ultimately drinking very ancient waters, rich in biodiversity that has accumulated itself during its path. This is the case of several countries water systems such as Austria, Belgium,

²⁹ Ibid. p.149

Denmark and Germany. Other countries that need to treat the water first with chlorine are effectively drinking ‘cleaner’ water, but this clean means that there is a lack of biodiversity. Such conditions are known in ecology as **“Competitive release”** - The expansion of the range of a species when a competitor for its niche is removed. This means that every species, pathogen, bacteria is left with no bacteria which can stop him from growing and thriving further.³⁰

³⁰ [Encyclopedia.com/science dictionary/competitive release](https://www.encyclopedia.com/science/dictionary/competitive-release)

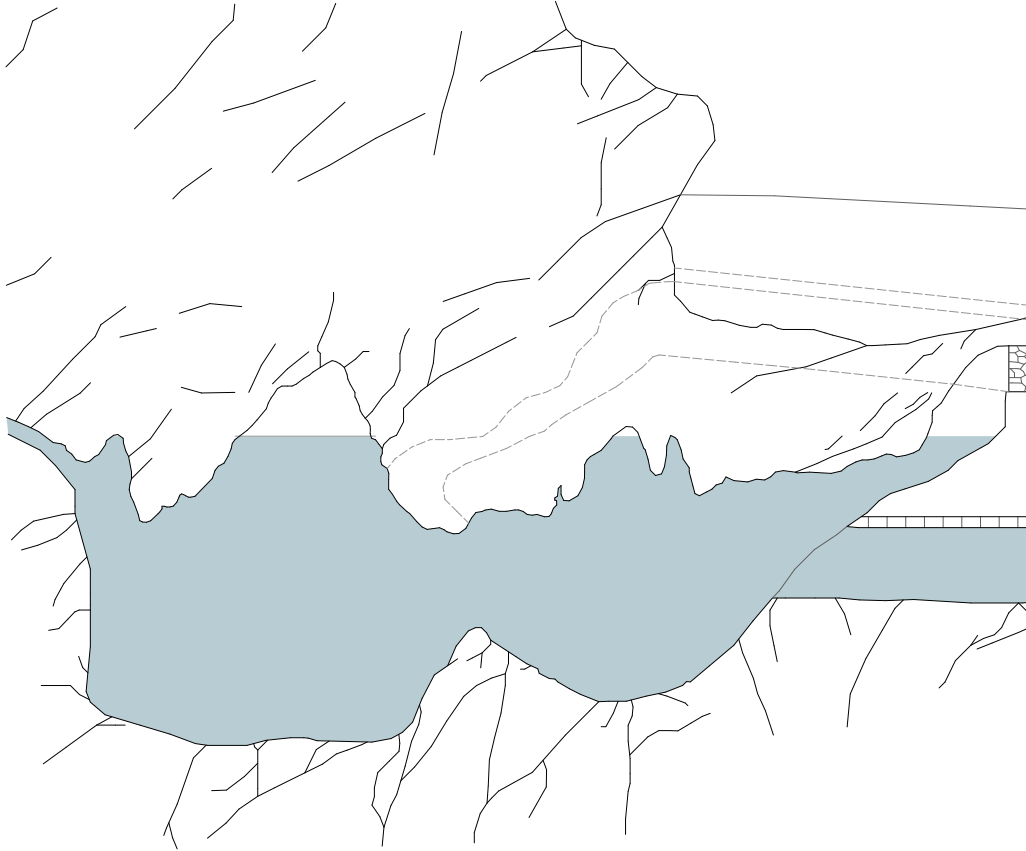
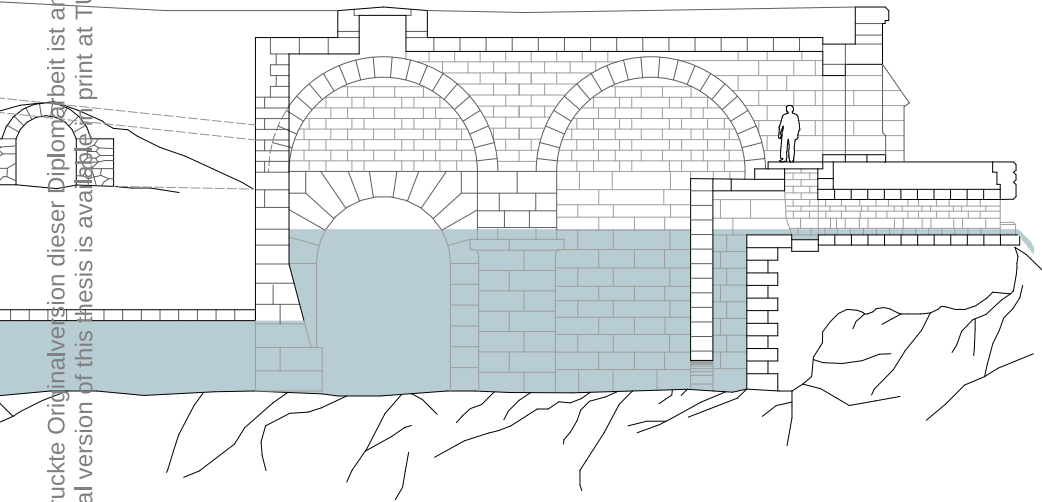


Fig. 16 Wasserschloss Kaiserbrunn section, reproduced from Carl Mihatsch, Table V in: Der Bau der Wiener Kaiser Franz Joseph Hochquellen Wasserleitung, 1881



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LÄNGENPROFIL D

vom Kaiserbrunn bis zum

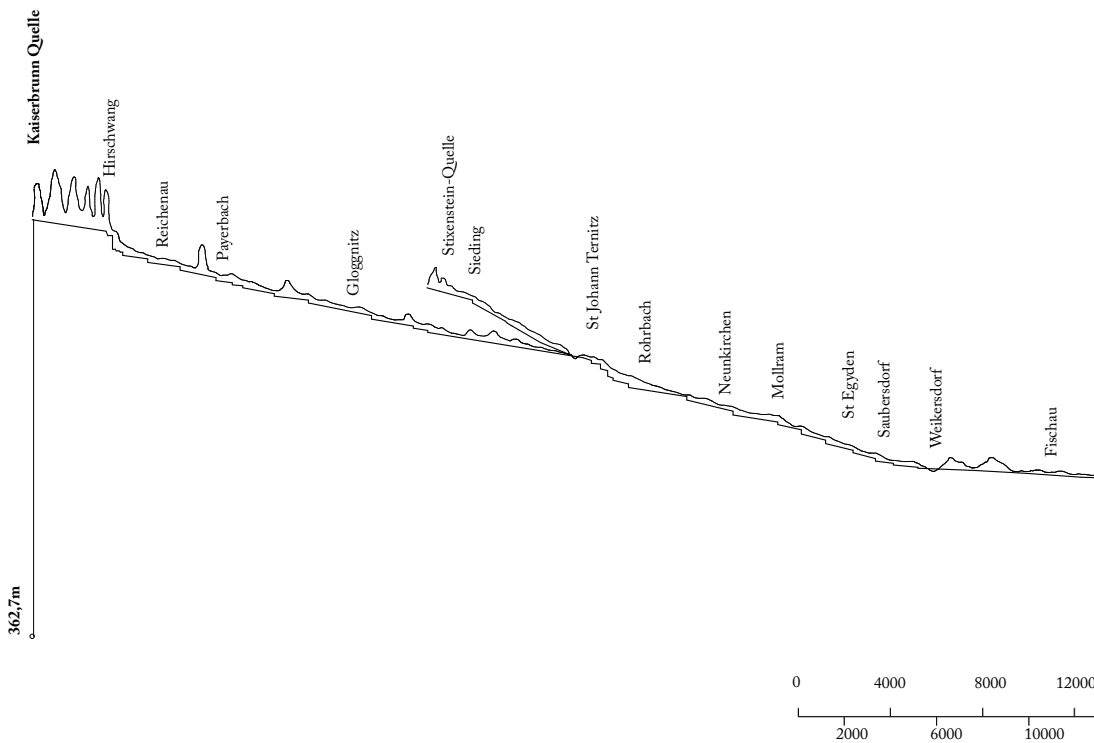
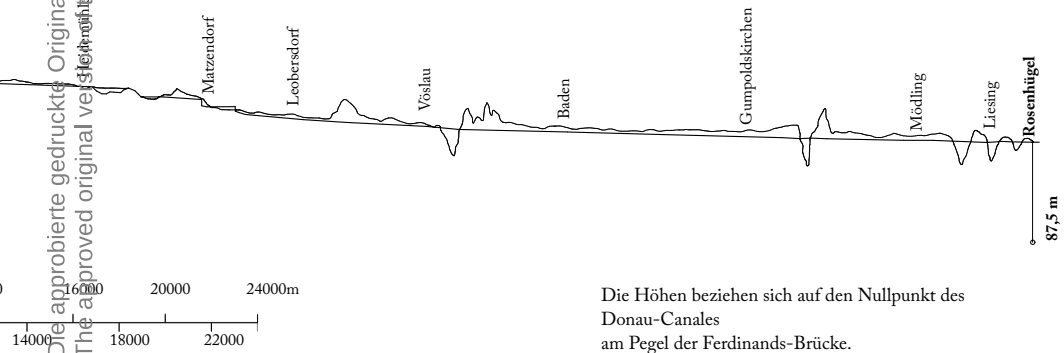


Fig. 17 Length profile of the Aqueduct
Reproduced from Carl Mihatsch,
Table I in: Der Bau der Wiener
Kaiser Franz Joseph Hochquellen
Wasserleitung.

DES AQUADUCTES

Reservoir am Rosenhügel



Die Höhen beziehen sich auf den Nullpunkt des Donau-Canales am Pegel der Ferdinands-Brücke.

Fig. 18 Pipe network of Vienna. Carl Mihatsch table
XXV in: Der Bau der Wiener Kaiser Franz Joseph
Hochquellen Wasserleitung.



Thermus Aquaticus

It is not impressive to find a new genus of bacteria as it is to find one in animal or floral kingdom, scientists say. However, this finding of a professor Thomas Brock in the 1960s studying the Icelandic and Yellowstone geysers did make a difference. On his way to research the colourful array of geysers he stumbled upon several genus of bacteria that he expected. Among chemotrops, cyanobacteria and archea there was another bacteria that managed to sustain life in these extreme conditions, by relying on dead particles and leftovers from other bacteria. Thomas Brock named the genus *Thermus Aquaticus* because of its ability to thrive in extreme conditions of geysers. In the laboratory he noticed that the bacteria kept growing only if the temperature was above 70 degrees Celsius, or even up to 80. To make things even more interesting, he found the same bacteria in his lab's tap water, after which he tried to find where in our household we could find conditions for a sustained life of this bacteria. It turned out positive that water heaters, and especially heaters in laundromats where heat is used more frequent that the life of *Thermus Aquaticus* was abundant. This was as Rob Dunn describes “the clearest reminder since Leeuwenhoek’s time—that the ecosystems in our houses are more diverse than we have thought, populated with far more on hand than the pathogens that have received so much focus.”³¹



Fig. 19 Yellowstone Geyser, natural habitat of *Thermus Aquaticus*

³¹ Dunn, R, 2018, Never home alone, p.43

The story of *Thermus aquaticus* is important for the following reason. In order to determine an unculturable species in a laboratory, scientists have to go through many steps. Some of them are straightforward and simple, whereas others, like sequencing the DNA in order to get the smallest bits of the DNA that still can read the genetic code of the species, can be time consuming. This is due to the DNA sensitivity to heat needed in a process called polymerase. It is here that *Thermus Aquaticus* found its place and gained its importance in microbiology. Its high resistance to heat allowed usage of its enzymes for polymerase chain reaction (PCR) and thus allowed a fast DNA sequencing that is used today as a basic tool for identifying a swab test.

Waste Heat

The already known laws of thermodynamics state that all systems are constantly in, or trying to establish, thermal equilibriums. This can be said for humans as well. By not having any thermo-regulative properties, we try to shape physical spaces and materials we wear on a daily basis so that our systems use as little energy as possible to keep the equilibrium. We could agree to what body temperature is considered normal and not causing any form of distress, but the outside temperature, the one we individually perceive as favourable, is debatable. *Kleptothermy*³² is not an option, at least not in the public realm. Every system, engine or living creature produces energy, and this energy is in most cases emitted through heat. We are surrounded by waste heat in our very households, with our very basic gadgets that allow us better life quality. However, according to Yale Environment study nearly three-quarters of all the energy produced by humanity is squandered as waste heat. It is clear that in the light of new energy challenges every source of energy should be re-thought, in order to rely less and less on fossil fuels. Danish crematorium started redirecting waste heat to homes, Facebook data server sent heat to 7000 Danish homes, German cement production as well. Data centres show a huge potential as well and these emerging start-ups from all around Europe

³² In biology, kleptothermy is any form of thermoregulation by which an animal shares in the metabolic thermogenesis of another animal. It may or may not be reciprocal.

are giving hope for a new ways of managing our resources. There is a wide array of ways to do this, based on different bits of physics: thermoacoustics, thermionics, thermophotovoltaic, and more, each with pros and cons in terms of their efficiency, cost and suitability to different conditions, Yale scientists conclude. Before heat is converted to energy, first it has to be collected and stored, so that it can be used in prolonged periods of time. This can be done in underground storages (aquifers), water tanks, or even in hard materials like stone. Storing heat within water would be an the most cost effective and simple way. The ultimate but most challenging goal would be to find a way to use the lukewarm waste heat from households. The EU Directive 2018/2001 specified wastewater as a renewable heat source in compliance with the European environmental goals. Moreover, under the European Green Deal Investment Plan, member states will be provided supportive aid to implement measures like the re-use of waste heat. It is estimated that 6000 GWh per year of thermal energy is lost in sewers in Switzerland, equivalent to 7% of country's total heating demand. Wastewater in sewer pipes in Germany is estimated to contain enough energy to heat 2 million homes.³³

While in a warm, dry state, they are suddenly saturated with water, there is an effervescence of the heat latent in the bodies of them all, and this makes them firmly unite and quickly assume the property of one solid mass.

Vitruvius on Pozzolana, Chapter VI, Book II

³³ Nagpal, H.; Spriet, J.; Krishna Murali, M.; McNabola, A. Heat Recovery from Wastewater—A Review of Available Resource. *Water* 2021, p.1



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Conclusion

Nineteenth century was marked by high aspirations in reasoning, inventing and understanding things. In 1848 Austria's liberal middle class became energised and forced the country's absolute, almost feudal monarchy, dominated by the Emperor Franz Joseph, to evolve along more democratic lines.³⁴ The shift in priorities, fabrication, standardisation resulted in slow but steady decline in collective enjoyment. This decline was substituted by inventions in all fields of sciences and psychology. The enlightenment's core idea that the human life is influenced almost exclusively by reason started to collapse. Not to diminish the importance of this scientific discoveries such as from Johannes Kepler in astronomy, Galileo Galilei with heliocentric theory, Isaac Newton with the force of gravity and last but not least Charles Darwin with the Origin of Species. These essential discoveries, although managed and conceived on a more intuitive basis during the middle ages through endeavours to harness the forces of nature, were for the first time orderly written, elaborated and unquestionable. Success in the realm of science led eighteenth-century thinkers to assume that other aspects of human action, including political behavior, creativity, and art, could be improved by the application of reason, leading ultimately to an improved society and better conditions for all humankind.³⁴ That is if Bourgeoisie needed visual stimulant, classicist houses were built to satisfy the eye, whereas ordinary everyday workers suffered more and more from the loss of quality in life. Jobs started being replaced by machines, working ours and conditions in the factories became extreme, which due to these hypocrites of the century resulted in biggest crises of spirituality.

*Every period has its contradictions. Two centuries, manifested by enlightenment produced in the Western Europe extraordinary progress in science, reasoning, music and architecture, but the matter of body was neglected.*³⁵

³⁴ Kandel E. R., The Age of Insight: The Quest to Understand the Unconscious in Art, Mind, and Brain, from Vienna 1900 to the Present, p.31

³⁵ Giedion, 1970, p.653

By researching through the history of dealing with water we can to some degree determine what the future will face. The goal of the following project is not to find a scientifically perfect way of re-using heat and finding out what else lurks in the water. Architects are very limited in what can be done differently regarding water installations now. The branch is compartmentalised and guided by a big number of guidelines that have to be fulfilled. This vision sees architecture of production, everyday architecture that serves us as a more active, visible, and tangible element in our daily lives. The position of architecture should be at the intersection with science and human nature and needs in the following challenges. It can also be a mediator in the the intersection of politic space and public dissatisfaction. After celebrating 150 years of the completion of the Rax Aquaduct project, it is perhaps a good time to start thinking how the next challenge can be foreseen instead of acted when the problem gets acute. Because regardless of place, a species will react to a set of conditions with evolutionary traits that yield similar solutions. I would like to go further and argue that the same goes for architecture and cities. The same set of conditions, will cause the same challenges that will produce similar, if not the same solutions.



Fig. 20 House of Diana, Ostia, c. 150 A.D

For the future projects that are spreading through the Vienna periphery this could mean an integration of public buildings such as baths near, or inside residential ones. This too, wouldn't be an unknown example. S.Giedion mentions that the abundant steam generated in bread making in middle-ages was often used for this purpose (vapor bath). Having introduced a tube into the oven, the company might bathe in the vapour so generously given off in the baking process.

Water culture comprises the intersection of natural and artificial elements in society, the exchange between human and natural realms.³⁶

³⁶Rogers, 2018, Water culture in Roman society, p.3



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Nature of learning relies primarily on imitation and repetition. Those two, accompanied by a story and reasoning behind it, form a ritual over time. Rituals, influenced by near order, are then formed in social scale and emerge as culture, whereas on the individual scale they define us as distinctive individuals we are. The body, on the other hand, learns kinaesthetically, and uses space as a referential point all the time, sometimes without our consciousness about it. When the body repeats a certain action multiple times it is stored as muscle memory. Moments in our daily lives where we have found the right rhythm and order in doing things, and repeated it so many times that we can rely on muscle memory to do the work, are the ones that allow idling state of mind. Space plays here an important role, especially in bathing experiences because the act is done while partially exposed. More open spaces are going to be perceived more uncomfortable, at least in the beginning. Our natural instinct will search for a corner, a niche, a small refuge to nest in from which we will have our back preferably against a wall and free view from which we can observe the environment. In the course of visiting many Viennese bathhouses this was my personal impression and something that I have learned by the observation of my own behaviour or the observation of obvious newcomers to the bathhouse. Other parameters can be temperature and materials. In bathing experiences we will most likely form our rituals solely depending on the need of our body. There is no right or wrong, especially in Viennese bathhouses. After the **red light** of the Viennese saunas has been turned off, all bathers take a short shower to wash off the sweat and disperse themselves all around the facility. Each has formed their own ritual, and even the friendliest chat during the sauna doesn't influence its sequence. This sequence of actions mirrors our very nature, and the way we communicate within a culture and vice versa. When repeated a certain amount of times, they form a rule, an unwritten code of conduct. Soon

³⁷ In Viennese Hallenbäder and Kombibäder this most often means that while the red light is on, nobody should either enter or leave the sauna as the temperature is the highest

everything that isn't following it, is regarded as uncommon or unusual. The space in which the ritual is performed is crucial to the essence of the ritual itself. In order for it not to become a pure routine there needs to be enough mental stimuli as well. Ritual, etymologically coming from Proto-Indo-European "ar" - to fit together". Also meaning number, counting, ordering the numbers, developed to "rtá" Vedic for well-composed holy order, "rīm" in old Irish meant number, "rim" in old Nordic as well account or calculation. From the same base also comes Serbo-Croatian word rima - arranged words (in verse). They all insinuate order, well-composed elements.³⁸ Antagonist to the ritual, to the well elaborated, repetitive sequence that we use to communicate there is chaos - an unknown realm. It is through this dichotomy between order and chaos that we have learned to perceive the world around us. Through these natural contrasts we have acquired knowledge to organise chaos into order and to surpass the unknown. Our basic orientation learning in the space relies on that contrast between left/right, up/down, light/dark, and ourselves in the middle, as a reference point from which we perceive. With the two opposing powers and us as the third we form a triad connection through which we relate towards the world. More often than not this is represented through the symbol of circle, for circle has its beginning and an end connected, meaning that in a circle we are connecting opposites into one whole - life and death, light and darkness. This builds a general rhythm of conflict between the time and space and it also guarantees recreation of order that has been ruptured by the chaos followed by another cycle.

³⁸ Etymonline.com

³⁹ Belaj, 2007, Hod kroz godinu, p.22

*The circle is a primary form: the sun's disc is an archetypal image. Man's use of global forms reaches far back. Even in the Mousterian Age he made red circles of various sizes. Stone balls and hemispherical hollows are found from Norway to Malta.*⁴⁰

The first well-known architecture with domed structure we find in history are tombs for the deceased - tholos. These sacred structures, monumental in their scale and character, are shrines for the deceased. What is inseparable from the Tholoi temples is the phenomena of the darkness, a secluded refuge where we can feel safe. This can be seen as an analogical interpretation of the mother earth, womb like space, mystic in its character. Although the traces of Tholoi and Tumuli can be dated to 5th millennium, its dynamic and potent form undergoes many transitions throughout history. Its beginning can be seen in the circular extensions in the temples of Malta, climax at many Roman Imperial Thermae, and furthermore re-emergence in the Renaissance where it finds the dominant position in the Christian churches in the forms of apses or domes such as St. Peter's in Rome. In each of the typologies the circular/domed space takes up the dominant role, the one where the attention to the detail is the highest. In their elaborate execution (such as Pantheon), one can experience a spatial immersion. This makes them take a special place within our culture, usually elevated from an everyday life or even sacred.

*The adjective sacred comes from Latin Sacer – holy, dedicated to a god”, and it is derived from sacro, –are “to dedicate”. From the same root comes the Latin verb sancio, –nxi, –nctum “holy, pleasing to God, honest”. Also related to this verb is sepio, –psi, –ptum “to enclose”. From this verb comes the saepta, the Roman voting booth. Sacred could in that case mean put into a holy, enclosed space. This matches well the meaning of profane. If Sacred is that what is inside the enclosure, than the profane as its opposition is outside of it. And indeed, profanus, is derived from the prefix pro- “in front” and fanum “the temple”. What is inside the temple is sacred, whereas what is in front is profane.*⁴¹

⁴⁰ Giedion, 1971, The tree space conceptions, p.9

⁴¹ Belaj, 2007, Hod kroz godinu, p.22

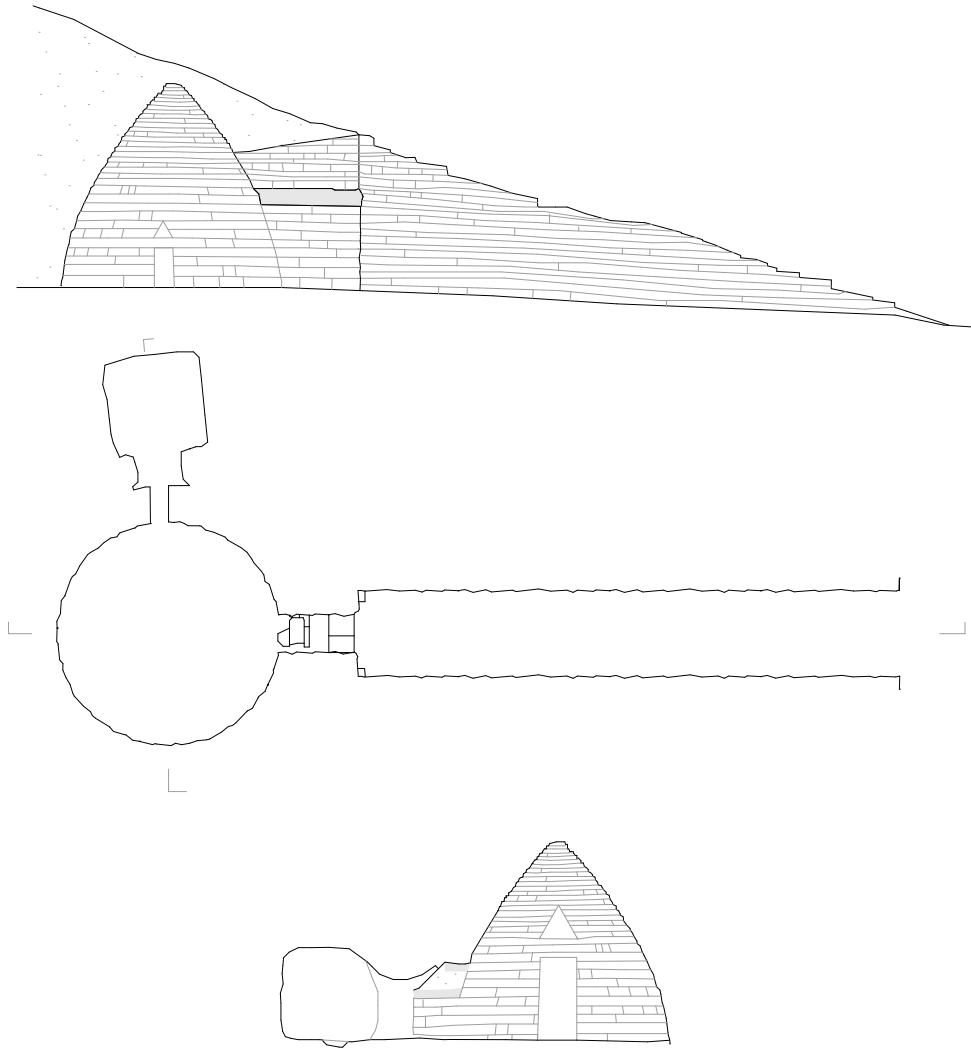


Fig. 21 The Treasury of Atreus, Mycenae, section and plan. Reproduced from A.J.B.Wace, Mycenae

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In the hostile environment of our history our essence of survival was ability to co-ordinately achieve goals of finding shelter, hunting and prey. These high risk actions had to be done in groups, in a coordinated manner. Our identification with a certain group is far more important to us than for primates. For humans it is a far more preferable choice to be wrong or left out from a reward but still attain the status of a member in a group.

With the beginning of agriculture our nomadic way of living in smaller groups was put to a halt. We stopped roaming the earth and started building permanent houses. As in pre-historic times, most successful groups would have been those able to compel individuals to form strong commitments to their cultures. Forming strong commitments to a culture was arguably a challenge for each evolving society because of the inherent competitiveness between different societies, resulting in need for outnumbering other groups, for bigger groups had more chance of surviving and thriving at the expense of others. The cost of being a part of a group had to be elevated.⁴²

The most successful way of elevating the cost of hominid ritual displays was to include the supernatural in the ritual – in other words, to “supernaturalize” the ritual. In this way, proto-religions started to emerge in the form of totemism, animism and such. With this, obligations towards religious communities started implying stricter rules, often involving sacrificing living creatures, giving personal belongings, or abstaining from food. The success of religious over secular ritual is very likely due to the fact that the inclusion of the supernatural elevates ritual obligations to sacred duties. Violating the ritual obligation becomes a punishable sin.⁴³

⁴² Rossano, 2016, The ritual origins of humanity, p.9

⁴³ Ibid. p. 17, Numerous studies have shown that religious communes have greater longevity than secular ones, with the most enduring religious communes being those that imposed the most costly ritual obligations.

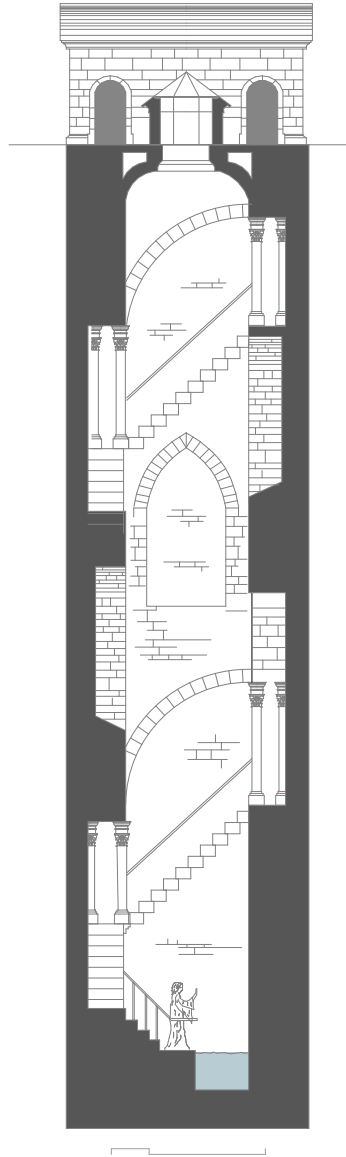


Fig. 22 Mikveh section in Friedberg in Oberhessen. Reproduced after cut drawing from Hubert Kratz 1901/02.



Gymnasium

The importance of ritualising bathing spaces was firstly emphasised in the Greek Gymnasium. That is not to say that the culture of bathing started at that point, but that the first elaborate and specifically designed spaces for bathing took place within the Greek gymnasium. By combining the physical and mental activities it soon became not only the centre where care of the body and hygiene was practiced, but also a cultural centre, where dinner parties with the authorities, festive sacrificing of the animals and celebrations, took place. In the beginning the Gymnasium was set out of the city centre and was usually a simple walled, included structure. After the increase of the educational character, the gymnasium gained importance and the structure moved to the city centre, usually close to an Agora. By that time, around fourth century B.C., an almost standardised typology of two main spaces emerged, a quadriporticus, surrounding the palaestra with variety of functions, one of them being washing rooms and extension for stadia and outside sports. Here, for the first time, bathing starts to be essential part of the program in the Gymnasium.



Fig. 23 Detail from a black-figure hydria with palaestra scene: Athletes washing

Some of the scenes depicted on the vases show that bathing rituals, often underneath a roof structure, took place in a communal context. As one bather takes care of the water in the basin, the other may be pouring water on fellow bathers, or help scrape the dirt with the *Stirgils*. Sculpted lions on the walls or on the columns, beneath the capitals show the first usage of shower, or at least purposefully designed object enabling easier use and better experience.

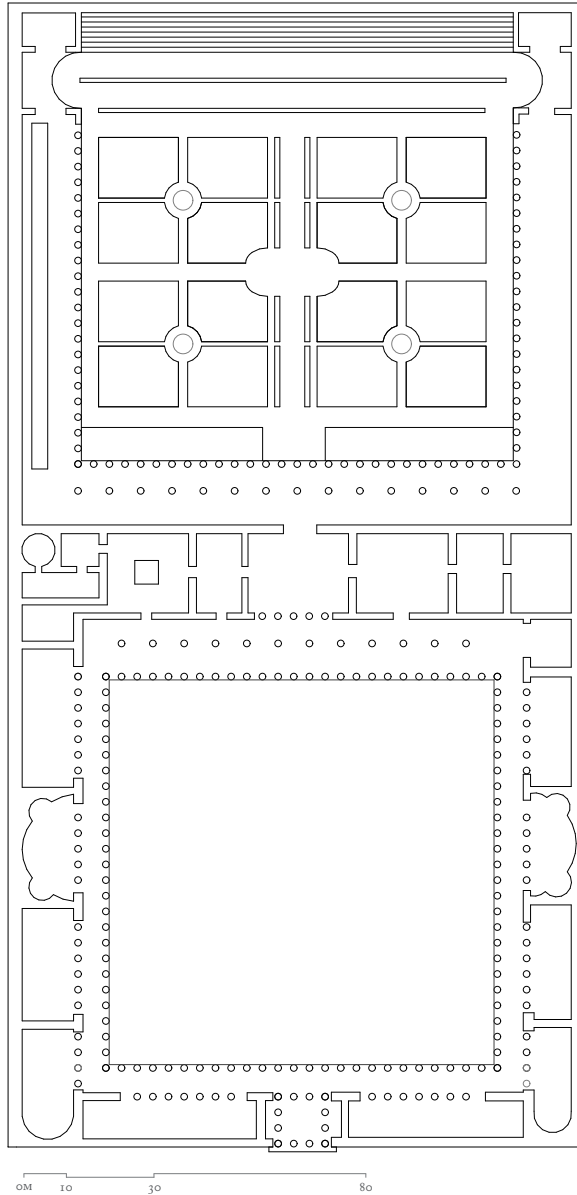
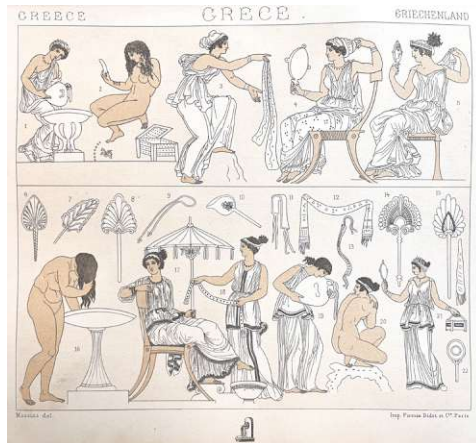


Fig. 24 The Greek Palaestra according to Vitruvius. Reproduced from Vitruvius, the ten books on Architecture, book V, chapter X

Taking in the account the whole span of greek architecture, and not only the Gymnasium, the floor-plans are dominated by the rectangular forms and the use of horizontal planes. Not that the circular forms were undesirable, but that they demanded even greater care in the execution. In the presented idealised plan of the Greek Gymnasium by Vitruv, we already see some emerging patterns. In the middle, the prominent Ephebeum, a central room for resting, massaging and conversing and on the far left side there is a sequence of rooms meant for cold and warm washing, including a distinguishable circular room - for sweating. This small domed room, within a small section in proportion to the plan is the only circular space. Even though heated bathing was practised from 6th century B.C, the heating systems were relatively kept simple, and no mechanical way of inducing the heat to the rooms wasn't thought of until first century B.C. ⁴⁴ It is supposed that the bronze cauldron was attached to the highest point in the centre and could have been moved up and down with ropes in order to change temperature of the room. Even simpler, these spaces were usually heated with simple charcoal braziers or the heated water was brought in the pots so that the bathers can suit themselves. In order to maximise heat circulation and minimise heat loss, these spaces were usually domed structures.

Fig. 25 Greek bathing accessories and customs, M. A. Racinet, *Le Costume Historique*, Paris, 1888, Tome II



⁴⁴Yegül, 1992, p24

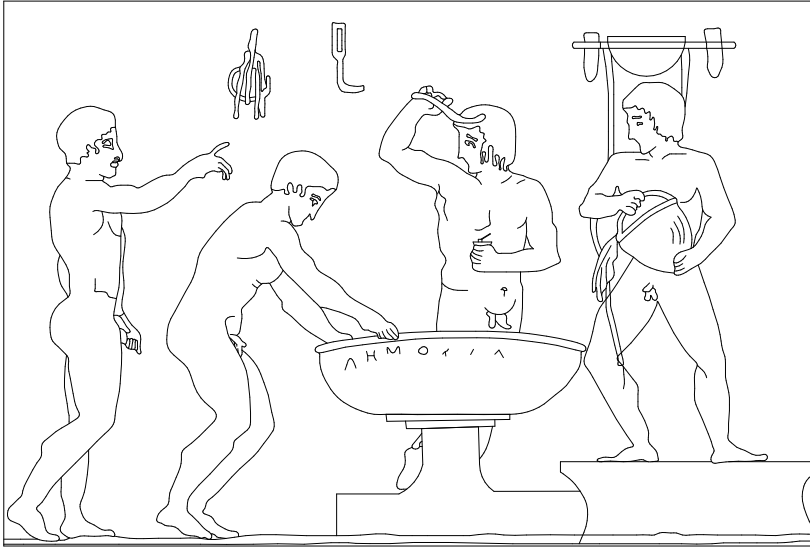


Fig. 26 Red-figure vase: Athletes washing in the palaestra, reproduced after drawing by D. Favro

Balnea

Parallel to the development of Gymnasium, another typology was practised - balaneia - or the public Greek baths, accessible by secular strata and not only the bourgeoisie. Unlike Gymnasiums, these Baths were usually built outside the city, on the city borders or at the pilgrim routes near springs, hence serving more for ritualistic and sacred purposes.⁴⁵ Its usual spatial disposition consists of simple rectangular rooms and hallways evolving around one or more main rooms. This circular and domed structure maximised the warmth dispersion and was reserved for hot baths. These complex structures were usually carved straight from the rock and consisted of small niches for bathers where they could partially immerse in water without splashing water on other guests.

*The concept of the rotunda, at least of its circular plan, was connected with tholos from the very beginning. We can consider the circular form as the primary form of all meeting places and perhaps also of all ritual buildings.*⁴⁶



Fig. 27 Hip baths from the Greek baths in the Sanctuary of Apolo, Cyrene. Niches for storing clothing above

⁴⁵ Trümper, 2014, Stadtkultur Hellenismus, p.220

⁴⁶ Giedion, 1971, p. 50

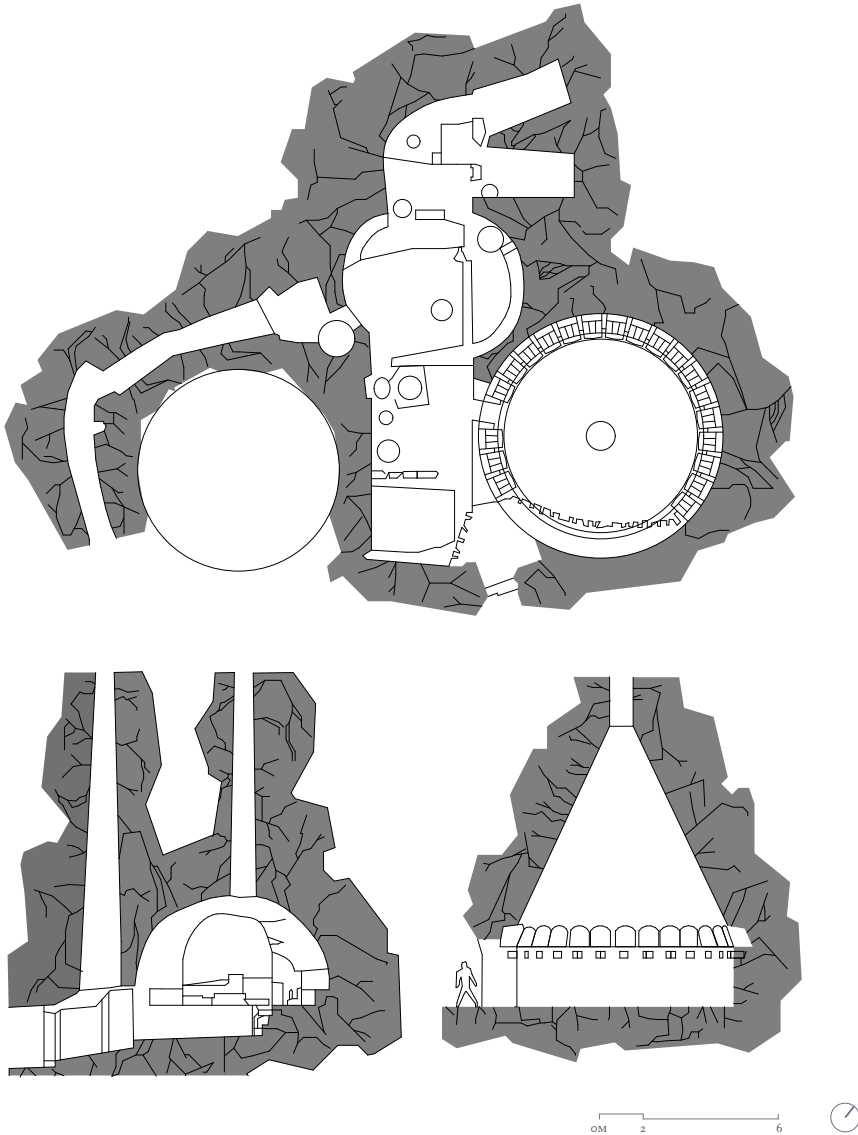


Fig. 28 Greek Balnea, Piraeus, Graphic reproduction after Ginouvès.

Roman Thermae

Leaning on the elements of a Greek Gymnasium, Romans extended this once pastoral typology to a great scale. Being the biggest empire at the time, and having access to the resources with the building capabilities, these simple structures with rudimentary ways of heating rooms had to be improved in order to accommodate masses up to 3000 people at the same time, as it was the case at Thermae di Diokletian.⁴⁷ However, one must notice that this architecture was used partly as means of representation and promotion of emperors. Despite this character, these cathedral-like structures undoubtedly were palaces of enjoyment. The abundance of water and light characterised these rooms and offered an extraordinary experience. Keeping in mind that regular working day of Romans started at sunrise and ended already at noon, following a small siesta, a vast majority of time until the dinner (cena) was spent in the thermae. In some cases, even the emperors would bathe with the commoners, but such cases could be prescribed to promoting political ideas in order to gain popularity, and in such way the thermae did serve also as a “classless” space of enjoyment. Bathing was a luxury and a necessity.⁴⁸ Almost every village or community had their own baths they were proud of, and one of the most efficient ways in suppressing the disobedience was to cut of the access of water in the Thermae. How included this in the everyday life of Romans was, we can see from the schoolboys journal.

I must go and have a bath. Yes, it's time. I leave. I get myself some towels and follow my servant. I run and catch up with the others who are going to the baths and I say to them one and all, 'How are you? Have a good bath! Have a good supper.'⁴⁹

⁴⁷Towards the end of Republic, around 27 B.C., there were approximately 170 baths in Rome, and by the end of fifth century it grew up to 856.

⁴⁸Lefebvre, 2014, p.5

⁴⁹As cited in: Yegül, 1992, p.30

However, the use of *thermae* was already distinct from what we had seen in the Greek *gymnasium*.⁵⁰ The simple actions of cold ablutions or sweating in the spaces heated with only charcoal braziers were the intersection between practising sport in the *palestra* and the philosophical discussions.⁵¹ The physical endeavour towards Olympic games was replaced with a mere physical activity such as playing handball or with a hoop, just until the sweat breaks, as the aim was not to overstimulate and tire the muscles. Besides, from the letters of Seneca we can see that a different atmosphere dominated in the *thermae* compared to the *gymnasium*.

I'll be damned if silence is as necessary as it seems for a man withdrawn for study! Here a mixed hubbub surrounds me on all sides. I am living over a public bath. Just imagine all the varieties of cries that can fill the ears with loathing; when the tougher fellows are exercising and thrusting arms heavy with lead, when they are either straining or imitating those under strain, I hear their grunts, and whenever they let out the breath they have been holding... Now listen to the brawler and the thief caught in the act, and the man who likes the sound of his own voice in the bath. Then add those who leap into the pool with a great splash, as well as those whose voices, if nothing else, are loud and clear. Imagine the depilator suddenly emitting his thin, shrill cry, calculated to make him more conspicuous, constantly uttering and never silent except when he is plucking the underarms and forcing the other man to cry out instead. Now I hear the different cries of the cake-seller and the sausage-seller and pastry cook and all the hawkers from the snack-bars selling their wares with a special distinct intonation. Seneca, letter 56, p. 1-2

⁵⁰ Although the rudimentary types of floor heating - hypocaust were already invented and found in the excavations of the baths in the Greek colony of Gela the biggest credit still goes to Romans, as they were the ones that perfected and spread the system throughout the whole empire.

⁵¹ Giedion, 1970, P.630

The rituals of the bathing changed, as well for the approach of the citizens towards it. The elementary character of the Greek baths is being replaced by representative, highly ornamented spaces, with the use of most luxurious materials. Two archaic element are united - fire and water, and through the *Thermae* they embody the representative character of the empire. In the abundance of wealth, every room is equipped with sculptures, every floor or wall with most detailed mosaic work. Although these monumental structures could not have been described as erotic, only the thought about going to such place makes a perfect prelude for a highly sensual experience that waits upon.

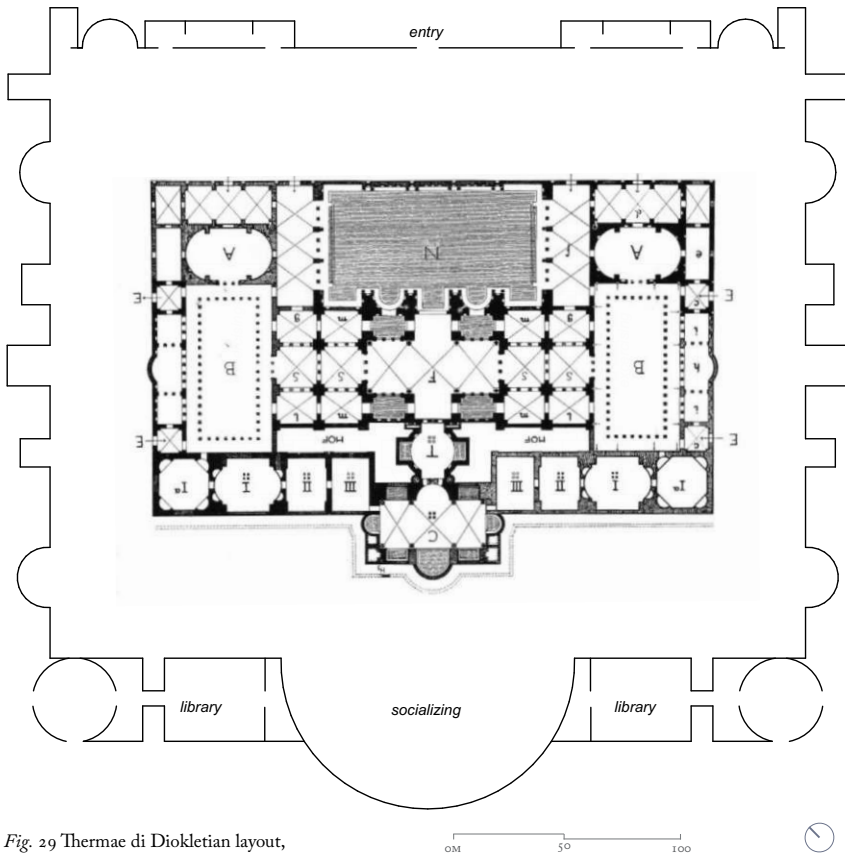


Fig. 29 *Thermae di Diokletian* layout, Yegül, 1992

Only with the Roman Empire did the thermae take on a sovereign significance, such as they attained neither before nor later. Their thermae became monuments of a nation that controlled the material wealth of the world. Within the walls, the best Roman technical, architectural and sociological thought was united.

Architecture of the Roman thermal baths builds upon the strong rules of symmetry and axuality. The descending form of the Tholos takes another shape, experiences new interpretations through new endearing monumental baths. This example can serve as a ultimate form of the ancient Tholoi experiencing a phenomena of spatial transition. However, in the palaces of enjoyment - the thermae - we are presented with a different approach, different phenomenology, namely that of light. Being the focal point of the Roman society and engineering, the typology experiences development programmatically. In order to reach full relaxation, it was not only necessary to take a hot, lukewarm or cold bath, or swim in the Natatio, but to follow a sequence: Tepidarium (lukewarm water) - Calidarium (hot air bath following the sweatbath in the sudatorium), and ending with a temperature shock in the cold plunge of the Frigidarium. With that, not only the first type of circulation program emerges (often presented by signs of feet on the wall or floor), but as well a strong axial relation of these main rooms. From the open pool with the most representative statues on their wall (Natatio), to Frigidarium, Tepidarium, to the warmest and most exposed, Calidarium. The Calidarium was the most frequent room, and in order to get the most of the sunlight, it was oriented towards the south and more exposed than the rest of the plan. The traces of the ancient Maltese temples are visible in the examples of Thermae di Caracalla or Diokletians Thermae, where the Calidarium is either circular or rectangular space, with semi-circular extensions where hot baths were placed. But what distinguishes these spaces most is the light. Through the scale of the Thermae these spaces became not only characterised by the abundance of water, but of light as well.

⁵¹ Giedion, 1970, P.631

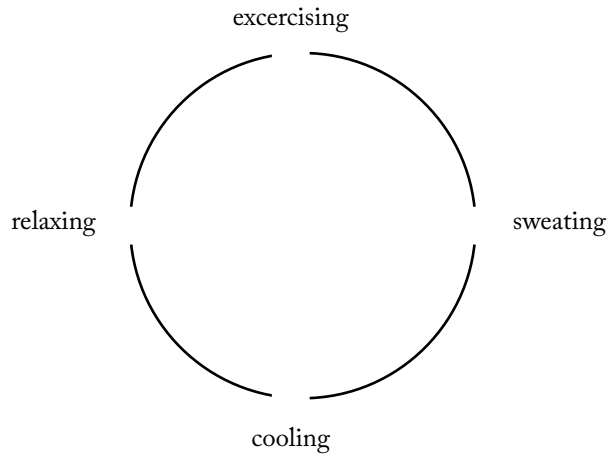


Fig. 30 Usual Thermae sequence



Fig. 31 Roman bathing accessories and customs, M. A. Racinet, Le Costume Historique, Paris, 1888



Fig. 32 Thermae di Sossandra, Baie, great Excedra, 2022

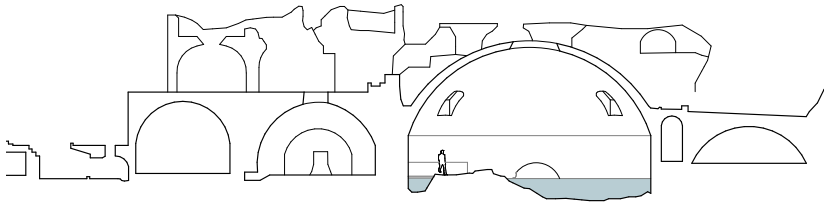


fig. 33 Thermae of Mercury, Baiae, section, reproduced from Borriello and d'Ambrosio



Fig. 34 Thermae die Baiae, Temple of Mercury.
First quarter of 1st century A.D. Domed Natatio,
diameter 21,55m. Four niches diagonally placed not
visible due to bradyseismic activities of the region.
Notable absence of brick in the building of the dome.

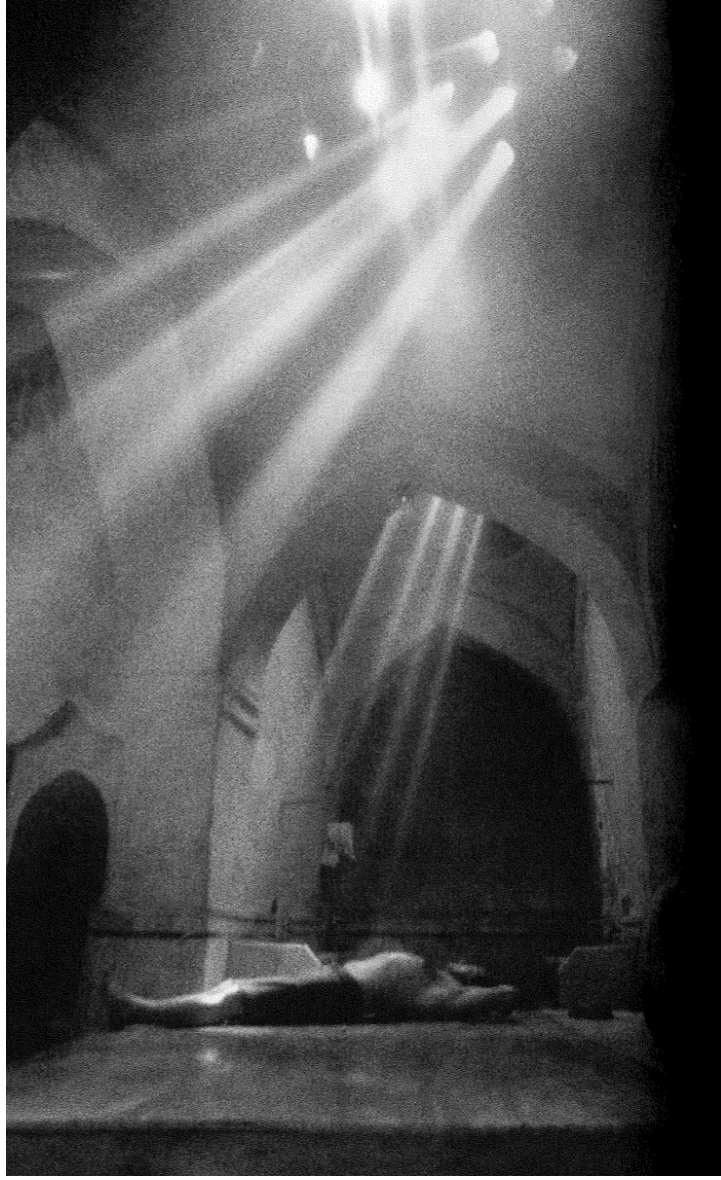


Fig. 35 The nickname “pagan cathedrals,” once applied to the ancient Roman baths, is also partially appropriate to describe the powerful religious quality experienced in hammam interiors. (Hammams, however, are decidedly Islamic, not “pagan” in the deprecatory Christian sense of the word.) Hammams, because of the emphasis placed on cleanliness/purification in Islam, have historically been complementary to the mosque. As a consequence, the endowment of baths by wealthy and powerful individuals was regarded as a pious act. Koren, 1996, *Undesigning the bath*

Steam

During the expanding years of Roman Empire the typologies of Forum, Amphitheater, Circus, as well as Thermae were erected wherever the settlements were set to be. However, on the way to Asia Minor, through Alexandria there was a sudden clash of typologies. The archetype, coming presumably from the todays Kazakhstan and Siberia over to Greece, had already been developed from its initial form to a certain state. Although there was no particular change in the form of the structures in North Africa, the examples of Dura Europos and in the period of pre-Islamic East show interesting adaptations. The presence of Palaestra, Exedrae, and all surrounding gardens perish. The scale of the thermae is not comparable to the compact structures in the streets of Kairo.

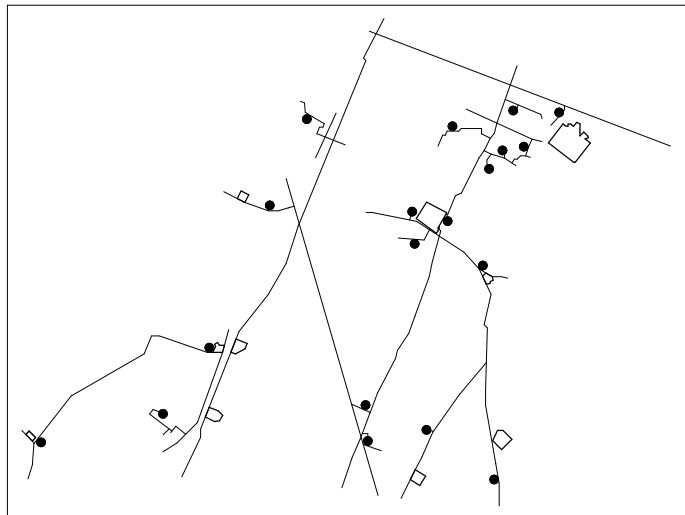


Fig. 36 Distribution of Baths in a Quarter of Cairo (black circles). In the 1930's some fifty hammams of the 11th to 15th centuries were still counted in Cairo, all of them small and serving their immediate neighborhood. (Pauty, Les hammams du Caire) Giedion S., 1970

The three-room sequence is altered because the most representative one - the tepidarium - is almost non-existent - reduced to a minimum due to Kairos already more tepid climate. It evolves in almost a hallway like space, resulting in a simpler division in hot and cold spaces. The tepidarium and its representative

scale and character have no place in densely built eastern urban patterns. The necessity of building densely is to a certain degree caused by the extreme climate. Vernacular architecture reacts to this problem with narrow streets, passages and underground structures with plentitude of shadow. Darkness has a different role as it is an antidote to heat. Caldarium or **beit-al-harara** takes the central position, and is still a domed part of the structure but, however, the vast presence of light allowed by the Tepidarium and its monumental scale is replaced only with small slits in the cupola and no horizontal openings. The lack of horizontal openings again insinuates the densely built urban fabric and its scale how dispersed hamams in eastern world are in one city, compared to monumental scale of isolated Roman thermal complexes. Moreover, considering cultural/religious regard that only moving water is pure, the tepidarium loses its importance. As religion prohibited the consumption of alcohol, Hamamas are starting to be closely related to religion, a purification of inner self and usually set close to the mosques. The character of hamams yet again serves the purpose of representing power, as a symbol of Islamic values, ideas.⁵²

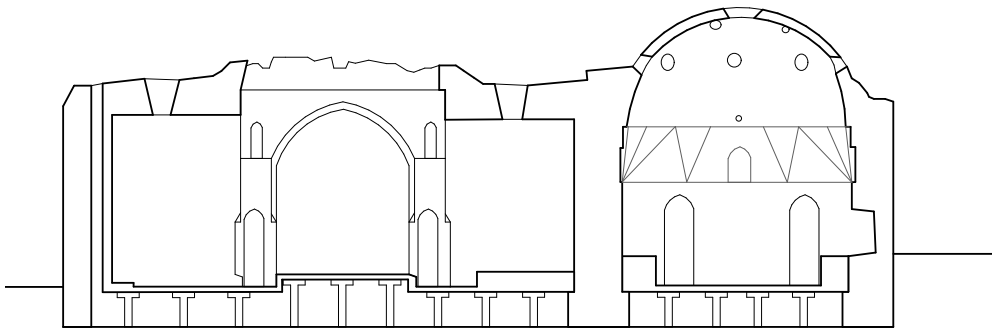


Fig. 37 Çukur Hamam, Section, hypocaust system
see list of figures

⁵² Cordova is said to have had 900 hamams, by the end of 10th century. It was so strongly present in the city that after the Arabs had left the area many of the hamams were destroyed because it was associated with oriental culture.

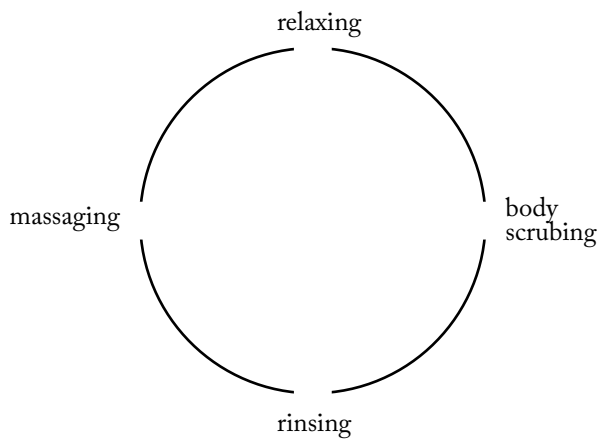
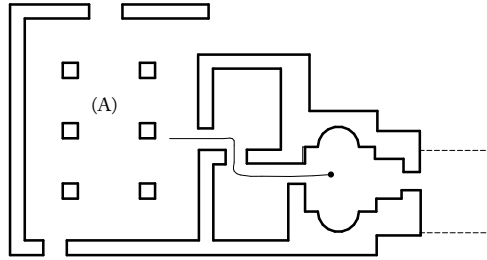
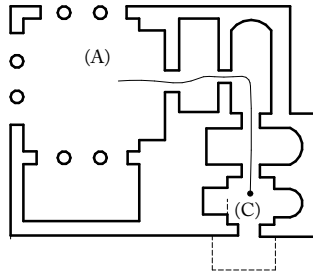


Fig. 38 Usual Hamam sequence

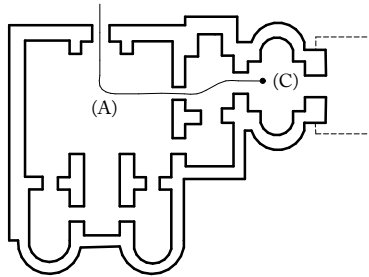
Bath of Dura Europos. The Roman thermae encountered its archetype in Syria and along the Eastern Roman frontiers. In the third century A.D bath at Dura was deliberately filled with sand and turned into a large Oriental rest hall (A - Maslak).



Bath of Brad, Growing emphasis on the rest hall (A) and hot chamber (C)



Bath of Kusair' Amra. The Ommayad caliphs took up the Syrian type and began to develop it into an Islamic institution. Same elements, same scale.



Bath El Hajib. Under Byzantine influence the installation becomes further differentiated: the hottest room (C) grows to conspicuous size, a trend that, as Eocharad has show, continued down to the present. Each room is given a cupola and radial vapor chambers are grouped around the hot air room.

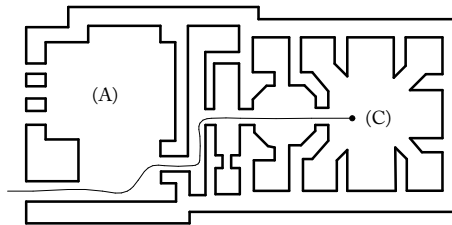


Fig. 39 Transition of the typology in floor plan. Reproduced after Giedion,1970

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Their strength of the character presents itself in the binding power of the community and day-to-day rituals. However, with modernisation, hamams lost their importance as the private and individual home baths developed. Turkish baths are the direct and only descendant of this long line of baths and bathing culture which started with Classical prototypes (Japanese baths and Finnish sauna come from different roots).⁵³ It even follows completely the heating system prototypes used from the Roman time. Unlike the Roman tradition, bathing never became a daily routine in Turkish culture. Although it varies from person to person and from season to season, visiting baths anywhere between once a week to once a fortnight is considered quite normal. Once there, however, cleansing is thorough.⁵⁴

Archaic elements of the Tholos and Tumulus is preserved, and the atmosphere is dominated by the antagonist of Imperial Thermae - the darkness. Half light, quiescence, seclusion from the outside world are preferred. In hamams, women can express their freedom far more than in the bustling streets where man vendors dominate. In the cupolas near darkness the spirits, the djinns, are said to meet. Here the active bather of the classical world yields to the passive repose of the oriental. A refined technique for loosening, cracking the joints, and a shampoo massage with special penetrative power supplant athletic sports.⁵⁵In the example of Dura Europos we can see that the large pool of frigidarium was filled with sand instead of cold water and took a role of resting room, one that is entered first and exited last. Beit al harara is now supplemented with a polygonal seat from which underneath the warm steam is dispersed, hence the word Hamam - heat dispenser.

*We close the eyes when dreaming, listening to music, or caressing our beloved ones. Deep shadows and darkness are essential, because they dim the sharpness of vision, make depth and distance ambiguous, and invite unconscious peripheral vision and tactile fantasy.*⁵⁶

⁵³ Yegül, 1992, p.350

⁵⁴ Ibid. p.351

⁵⁵ Giedion, 1970, p.637

⁵⁶ Pallasma, 1996, p.50



Fig. 40 Hammam Sandals, Nalin Unkown (Turkey) A pair of wooden sandals from 19th century with high heels embedded in indentations in the sole, ornately decorated. Common type throughout Ottoman territory, worn by women, children and men in order to keep them from coming into contact with the soap and the dirty water spread out across the floor.

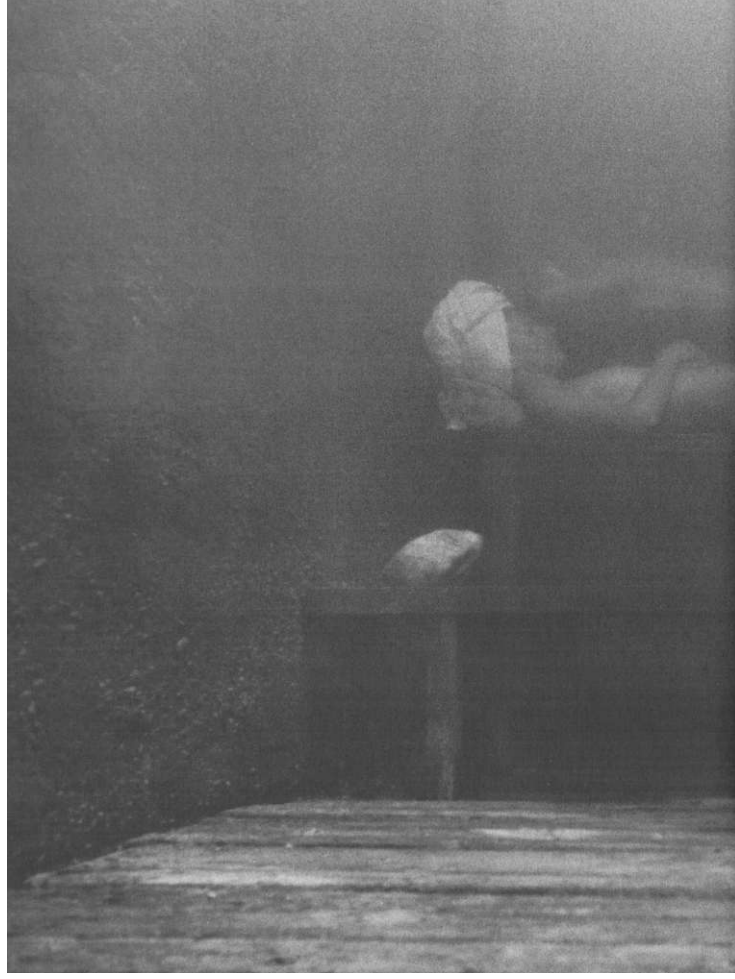


Fig. 41 A $1\frac{7}{8}$ meterwide, $4\frac{1}{3}$ meter long, and $2\frac{1}{8}$ meter high steamroom built over a gurgling hot spring. Spaces between the floor planks allow mineral-laden steam to rise up and heat the room.
Koren, 1996

Steam

Known as Finnish Sauna, Savusauna or a Siberian Sweat lodge proved themselves as the most efficient and enduring typologies in the bodily regeneration. Their beginnings can't be dated, and are attributed to somewhere around 7000 B.C., in context of cults worshiping the rivers, springs or the dead.⁵⁷ The historical endurance could be attributed to their simplicity and very few necessities in order to achieve the wanted effect. A small wooden hut, an open fireplace with heated stones where one can pour water to produce steam, the birch twigs to stimulate skin circulation and mutual massages and whisking of bather is all that is needed for this. In winter, one rolls in the snow, and in summer months the nearby river or lake can be used for contrasting effect. The simplicity also attributed to how widespread this typology was. Ancient Thermae, Gymnasion couldn't have been built in the rocky mountains and in full and overgrown woods. In comparison to the roman Thermae, this institution involved no slavery, as all bathers are equal and helping each other achieve regeneration.

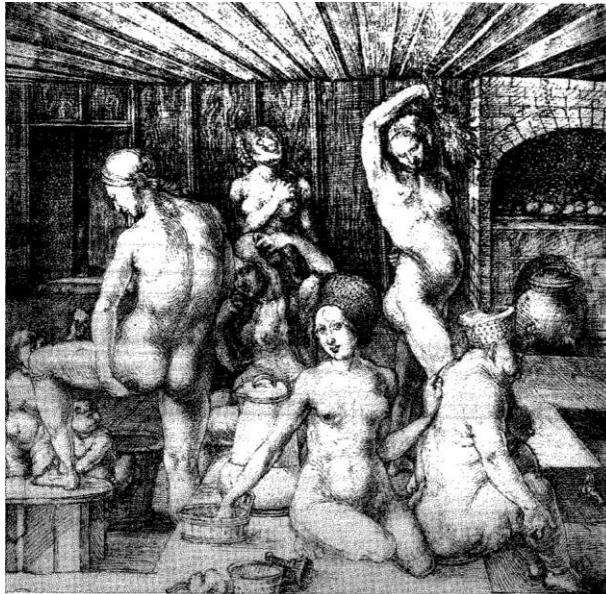


Fig. 42 Late Gothic Steam Bath. "The Women's Bath", Drawing by Albrecht Dürer, Nuremberg, 1496

⁵⁷In the East it is said that even before building a house one had to build a Banya (sweatlodge), and due to frequent exposure to birch tarch and smoke it was used afterwards as a place for delivering newborns as it was more hygienic than any other space.

*the pitilessly rendered nakedness of the old woman in the foreground, the various gestures and actions of the hands, the erect maiden striking her skin with the bath wisp (birch twig), the low wainscoted room, the open heart build up to the ceiling height, the vats from which one sprinkled one's body with water, the pile of heated stones, the round or chest-shaped cauldrons, and the various levels within the bath chamber.*⁵⁸

During the Middle Ages the European Badestuben (most similar to today's Sauna) developed themselves as places of social interaction. Numerous and seldom different in their structure, bathhouses held important part of the city. Among the Market, Blacksmith or Mills, Bathhouses were also listed as privileged places in a city. The fact that the Middle Ages did not take care of cleanliness is easily dismissed only by the number of public baths in i.e. 4 public baths in Mainz, 15 in Frankfurt am Main in 1387. In the 15th century Würzburg there were eight, eleven in Ulm, thirteen in Nürnberg and twenty-nine in Vienna. The 13th century France had twenty-six established bathing facilities. With the Bubonic plague that has arguably swept a half of the European population, the development of healthcare and hospitals took place.⁵⁹ At first simple blood-letting, cupping, shaving beards and minor operations took place in the bathhouses. In the decline of the Bathhouses we can see similar pattern as in Roman Thermae. Inexperienced bath-keepers set the temperature so high that the bathers would fall from the benches, or get burned or the consumption of food and drinks rises to the point that it is no longer distinguishable if it is a Bathhouse or a buffet.

⁵⁸ Giedion, 1970, p.645

⁵⁹ Europaverlag, Bäder in Wien, p.12

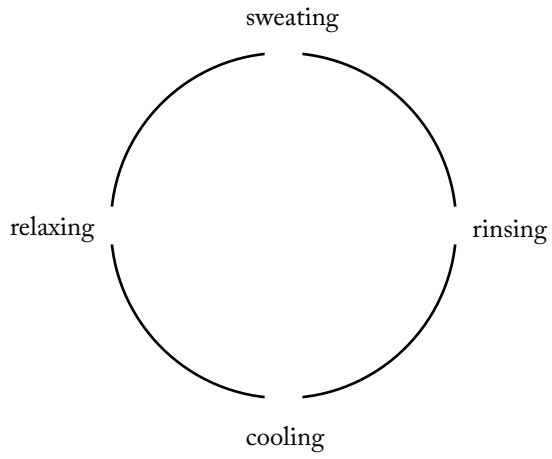


Fig. 43 Usual Sauna sequence

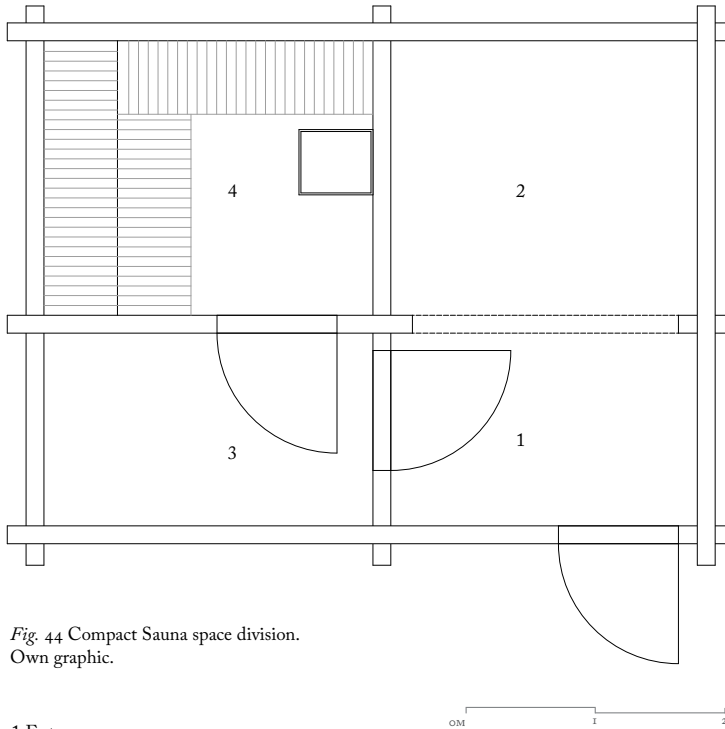


Fig. 44 Compact Sauna space division.
Own graphic.

- 1 Entrance
- 2 Changing
- 3 Cooling
- 4 Sweating

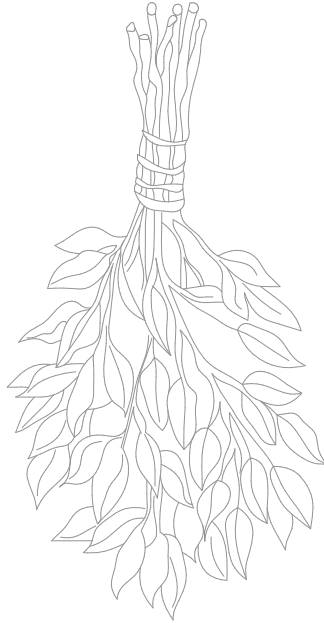


Fig. 45 Birch twig



Fig. 46 A riverbank sauna by Alvar Aalto



Fig. 47 Rest after a long voyage, Yang Zhang, Xi Zao
(Shower), 1999



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Soak

Parallel to historical advances in technology of dealing with water the everlasting need for bathing in natural surroundings has always been present in human lives. Be it in natural springs, waterfalls, lakes, rivers or geysers our inseparable connection with water bodies always tempted us to use it for practical and leisurely means. Thermally rich countries such as Japan with over 27.000 hot springs have an indefinably long history of using these natural wonders. The archetypical meaning of water carries with itself a pleasurable setting.⁶⁰ Japan has a long history of bathing, too.

*The history of the Kingdom of Wei, indicates that the Japanese were doing ritual bathing by at least A.D. 297, the beginning of the Tumulus, or Kofun. This bathing was for purification after encountering the pollution associated with death. The Japanese of this period built elaborate burial mounds for influential people, indicating well-developed religious and political systems. This is the period of the first historical record of some type of bathing in Japan.*⁶¹

In a number of the myths, various gods cleanse themselves by bathing, providing some of the earliest Japanese indications of the necessity of ritual cleansing and the importance of water ablutions.⁶² Although every bathing culture requires washing off before entering the bathing parts, Japanese culture accentuates this part the most. This could be visible in the typical plan of the sento where the part with faucets and sinks for individual washing takes in as much space as the part with tubs for relaxation. The importance of this is due to the fact that every bather will enter the same water in order to relax. In the household baths, it is very common that one bathwater will be shared by all family members, sometimes even simultaneously. This is reflected through the language as well with the term skinship or **sukinshippu**.⁶³ Pure/impure, inside/outside, up/down: these three oppositional sets are deeply embedded in the Japanese worldview and ethos.⁶⁴

⁶⁰ Hildebrand, 1999, p.29, However, we were not the only species that has been using this benefit. The Macaca monkeys (*Macaca fuscata*) have gained world-wide attention after they have been observed using springs repeatedly, in big groups.

⁶¹ Clark, 1994, p.19

⁶² Ibid. p.20

⁶³ Ibid. p.73

Still, one of the most distinctions with previous two cultures it that Japanese bathing spaces are originally far more related to the outside. Most often at ground level, elevated only a couple of steps this marks a different approach than hammams. Instead of complete inwardness there is a close relation to surrounding nature. Borrowed scenery 借景, pronounced in Chinese as jiejing and in Japanese as shakkei, is presently understood as a certain contrivance in landscape design where an outside view is incorporated to become part of garden scenery.⁶⁵ This however doesn't include only the visual, but as Wybe Kuitert suggests, jeijing relates to garden design in broad perspective, inspired by landscape, appreciated with all our senses. In this mutual exchange, both the garden maker and landscape are interchangeably either the object or the subject.⁶⁶ This unfortunately does not apply to Sentos in densely populated cities, but there we can see that nature will often be substituted with a big wall painting depicting famous sceneries.



Fig. 48 A Prosperous Bath House in the Licensed Quarters Toyohara Kunichika, Woodblock print, Meiji Period, late 19th century, public domain.

⁶⁵ Kuitert, 2015, p.32

⁶⁶ Ibid. p.33

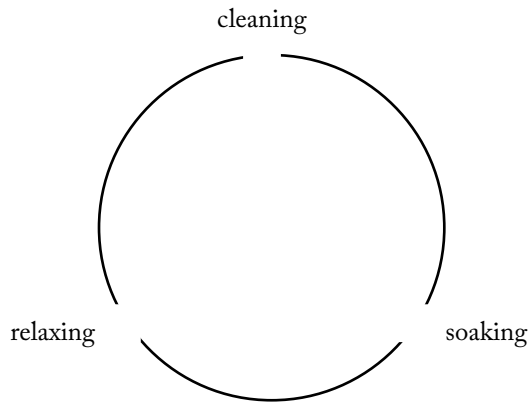


Fig. 49 Usual Onsen/Sentō sequence

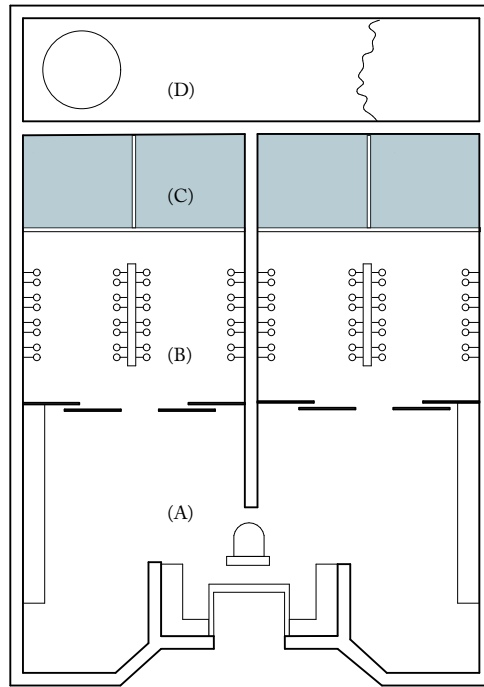


Fig. 50 Simple Sentō space division, mirrored space for both genders. (A) Entrance and changing rooms, (B) Facets and showers, (C) Tubs, (D) Boiler. Reproduced graphic, public domain.

Conclusion

When we are thinking about immersion, not only the physical but also mental immersion is taking place while bathing. Furthermore, we are not immersing only into the physical properties such as water or sand, but also into the abstract ones. Body reacts with all senses to the physical immersion, while the abstract one is connected to the psychological realm. In this realm architecture takes its role as a medium for allowing psychological relaxation to take place. It allows this by means of constructive expression, using architectural elements in such a way that one's mind can wander off into imagination. This can be created either by tectonic or atectonic means of expression, depending on the wanted effect. The atectonic means such as material texture, temperature, colour, light and pure volume of the space can stimulate to the feeling of safety, privacy. In a sense, there is pleasure that we gain from putting strain on the body. Sitting in the room that is about 100°C hot is not in itself an enjoyable situation, nor is it a 5°C cold but short water dip afterwards, and yet there is something pleasurable and joyous about it. Here again the very agent that makes us uncomfortable, that is either hot or cold extreme, is the medicine making us feel regenerated afterwards, precisely because of the contrast. Be it slowing down of the blood pressure in order not to overheat, or the sudden change and rush of it when immersed in cold water, or just the ritualistic side of it, it does indubitably bring enjoyment. A sense of peril and uncertainty is present as well. We are well aware that rituals involving body stimulations or restraints are not sustainable for a long of time, yet, we are willing and eager to try, to endure through the otherwise unbearable conditions, for the supposed benefit of the outcome. Hammams rely on the steam as a direct spatial agent we can be immersed in, as it blurs the vision and the borders of space and becomes almost palpable. It decreases the attention and restricts it almost exclusively to the body. However, without spatial volume for steam to slowly go up or circulate within a dome and be sporadically struck with a light beam, it is not possible to achieve spatial immersion. The entirety of space is actually always

immeasurably large, but the parts of it are, however, measurable. The potential of the sacred in the architecture arises when the immeasurable is shaped by the measurable.⁶⁷ Here the contrast lies in the interplay of darkness and light, and the further away this play is graspable, the more can one feel united within a space - immersed.

Formally the most representative spatial analogy of the immeasurable would be the dome. The perfectness and immeasurability of the circle is extended and spatially revered through the domes. Each dome has its own frequency. Historical domes in architecture paved the way of music development as well. As Hope Bagenal explains in the example of St. Peter's basilica in Rome in *Planning for Good Acoustics* why the acoustical conditions of a church must by their very nature lead to a definite kind of music.⁶⁸ In order to speak to a congregation in this five-aisled cathedral the priest couldn't have used very loud or very silent voice because of the high reverberation. He defined a "sympathetic note", which would be around A of A flat that in this case could bring the words of the sermon throughout the cathedral, and not lost in echoing sounds. He goes on further and describes how each era, with its prominent buildings gave rise to a certain musical style, for example J. S. Bachs compositions that were made exclusively in St. Thomas church in Leipzig. With inclination in furnishing the public spaces such as theatres the sound gradually changed, it was absorbed in the textiles, mouldings and wood profiles which then again influenced the music. As a result, the reverberation was very short and every note - even in such florid musical ornaments as coloratura and pizzicato - could be distinctly heard.⁶⁹ In modern times, our apartments are more and more isolated from the outside world and lack the necessary biodiversity for our health and we are deprived of one more essential means of experiencing architecture. We are deprived of sounds that are continuously being silenced. Most of the spaces we inhabit on daily basis are acoustically poor.

⁶⁷ Brnić, 2019, p.183

⁶⁸ Rasmussen, 1962, p.226

⁶⁹ Ibid. p.232

Using the thermal bath requires a constant change between two moods: the composed small one and the indefinite large one. The frequency of repetition and the architecturally emphasised intensity of these two contrasting states bring about a spontaneous ritual of contemplation and expansion of perception, which increases the sensitivity to the spatial change in scale from peripersonal to extrapersonal space.⁷⁰

Our day-to-day lives evolved a lot from the ancient times, yet our bodies did not to such extent. We still cannot survive in certain extreme climates, yet our mental and perceptive powers are being pushed to an extreme and stunted by the means of modernity. This pattern reflects on the cities as well. Cities where we participate daily with our whole bodies, and while muscles and senses begin to be over-filled with abstract imagery, advertisements, sublime ideologies and noises. Architecture holds potential of transforming these experiences, isolating us from the turbulent city towards inner self. Not only transforming, but allowing the invisible, the peripheral, the odourless to be perceived actively. Focusing on our bodies in privacy can allow us transcendental experiences. Such awareness is the essential part of developing the consciousness of perception. Arts like cinema, painting or music can involve our bodies or feelings to unsurpassed levels but of all arts, only architecture can evoke all senses at once. Encountering architecture one allows the silent language of architectural phenomena to speak to us while we roam freely. We live in the world where digital spheres are competing for the last resource that can be capitalised - our attention and time. Prevailing gist is that of productivity, efficiency and almost obsessive personal growth, where every minute should be used purposefully. What this project allows is the detachment from this highly influential world, and allowance of leisure to develop.

⁷⁰ Brnić, 2019, p.185

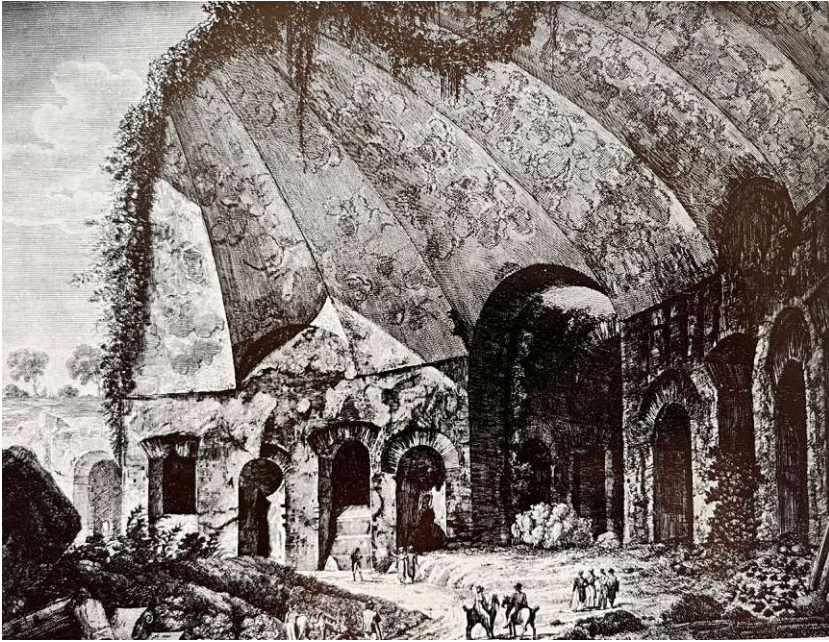


Fig. 51 Tivoli, Villa Adriana, Serapeum, 130
A.D Ribbed dome with its concave bulged
segments. Luigi Rossini

3

The middle-ages in Vienna had a lot to offer regarding bathing. The most famous part of the city for bathing, by the former Gate and Tower of the city is still called Stubentor, because of the high number of bathing “Stuben”. The number of these facilities was on the constant rise during the middle-ages and by 1736 Vienna had 28 public baths.⁷¹

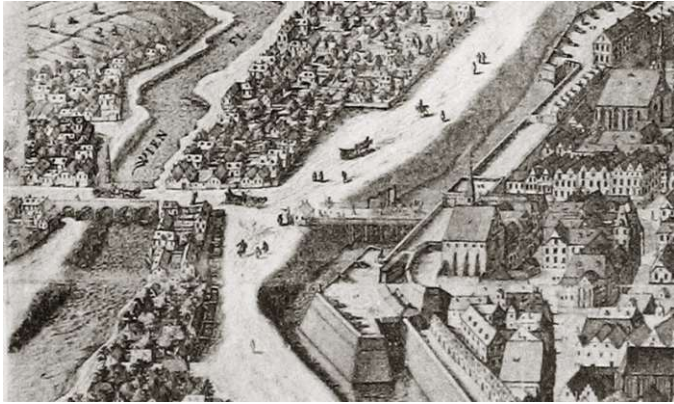


Fig. 52 Stubentor 1609

Stuba - an oven within a room - Frankish,
derived from *istûba* - slavic, developed to
étuve - French,
Stube - Altdeutsch
stove, stew - English.⁷²

People thought that new illnesses coming from the crusades and meeting with foreign cultures and their bacterial worlds could be treated, among many other amenities, with warm water. However, their rapid decline left the city with only six of them only by the end of the 18th century. However, there ought to be a mention of the first medical procedures that took place inside these bathing facilities. The term “Barbierer” comes from this age, and it describes a person that among other things would perform small surgical actions that were

⁷¹ Europaverlag, 1987, Wiener Bäder, p.12

⁷² As quoted in: Giedion S, 1970, This author also refers to a tenth-century Arabian historian, Mas' ūdī, who calls these baths *al-itbā*, a word apparently derived from the Slavic *istûba*. p.647

be beneficial to body, such as bloodletting, or tooth removal.⁷³ Later, with the development of medicine this profession remained connected only to shaving and cutting hair, whereas medicine and doctors took the direction of dealing with microscopic world that was being slowly discovered. In 1643 swimming in the Danube and all its tributaries was forbidden, because the number of drowned people was increasing. Beside the new dangers of illnesses, regarding nakedness as sin, and “little ice-age” that gripped western Europe, bathing in nature under clear sky was slowly trending. Renewed prohibitions in 1717, 1781 and 1799 are a clear sign that the pleasure in bathing was not coming to an end.⁷⁶

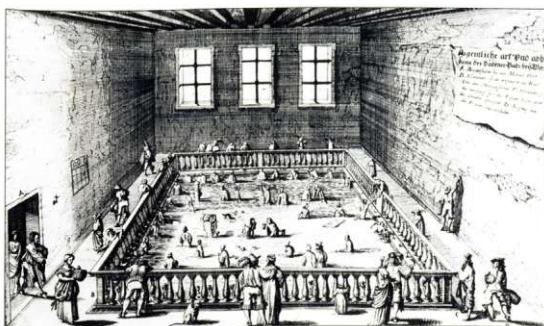


Fig. 53 Bathhouse in Baden near Wien in 1670

Last but not least, the Napoleonic Wars and the battles of Aspern and Wagram (1809) contributed to the promotion of swimming lessons, because many soldiers could not swim and were drowned in the Danube.⁷⁶ This fact also contributed to a development of swimming schools by doctors Pascal Joseph von Ferro and Johann Peter Frank. Most of the floating bathing ships were situated at the canal of Danube and branches of Danube itself. However, most of the facilities offered only a well fenced area for swimming without the danger of whirlpools or strong currents. Because the basins were relatively shallow (1,5m for adults and 0,8 for children) they were mostly used for body hygiene and leisure.⁷⁷

⁷³ Europaverlag, 1987, Wiener Bäder, p.15

⁷⁴ Ibid. p.16

⁷⁵ Ibid. p.18

⁷⁶ ZfU, 2019, Wasser Stadt Wien, p. 294

⁷⁷ Ibid. p.298

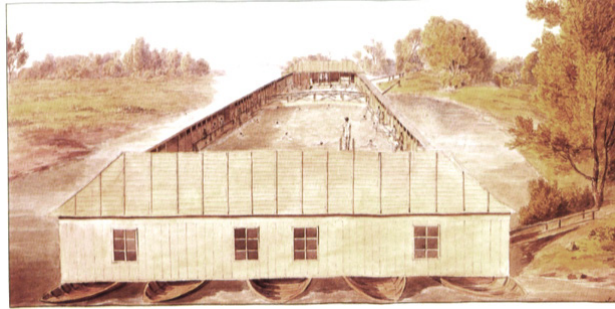


Fig. 54 Military School in Prater, Vienna 1813



The turning point for architecture and scale of bathing facilities happened with the first indoor halls. One of the most prominent examples mentioned is the Diana Bad (Diana's Bathhouse), built in 1810 by Jean Charles de Moreau and Mayer Carl Hummel in the area of Danube canal. This bathhouse consisted of 68 bathing cabins, 78 tubs out of zinc. Further building extensions made the complex even more appealing to the public, by adding a first closed swimming hall arched with iron construction spanning over 20m. The hall had the possibility of changing the floor during the winter months in order to accommodate dancing balls, which guaranteed a distinctively Viennese atmosphere. Moreover, as the result of the absence of Concert venues, Dianabad and Sophienbadsaal were two important Concert venues of 19th century Vienna, where, among others, many of the dynasty Strauß and Carl Michael Ziehrer performed their work for the first time.⁷⁸

One of the first bathhouses that re-integrated elements of antique bathing - the steam and heated air - and with those spaces designed for a passive activity, rather than a swimming pool, was only in the 1872. One year before the World Exhibition took place in, Vienna had finally received a modern bathing facility that met cosmopolitan standards, and that, in this respect, was no longer behind

⁷⁸ Europaverlag, 1987, Wiener Bäder, p.29

the much-vaunted Budapest. The “Römisches Bad” became the first bathhouse that was designed totally in the style of new classicism, highly ornamented, with extensive use of pillars, marble, statues, etc. It was a private facility, and was regarded as a serious establishment. After the bombings in the Second World War it was adapted for offices and storage spaces.⁷⁹

Fig. 55 The tepid and cold water pools in the former Roman baths in Vienna's 2nd district, unknown photographer, public domain.



Abb. 412. Römisches Bad. Laues und kaltes Basin für Herren.

The beginning of wide-spread usage of bathing facilities in the city began with the development of the so called Volksbad, in 1888, Mondscheingasse 9, in seventh district of Vienna. The problem of drinking water had already been solved, and the concept of hygiene as an important part in maintaining health during the years of cholera and typhus epidemics was slowly being accepted. On November the 9th, 1886 the city decided that all Viennese districts should each get a public bathhouse where entrance fees could be low.⁸⁰ The big influx of people visiting the bathhouses, as their residential houses still didn't possess a bathroom, resulted in water pressures being low, to the point of dripping, hence the more common name for this type of bathhouse - Tröpferlbad. Not far as 1985, there were still 500.000 people in Vienna relying on the Tröpferlbäder, but at that point they were mostly used by elderly or migrants. Other bathhouses were in the process of renovation extended with Sauna facilities and removed the division between classes inside the bathhouses. Today there are only six of

⁷⁹ Ibid. p.32

⁸⁰ Ibid. p.35

of them in use.⁸¹ Furthermore, with the standardisation of bathrooms fixtures in all residential buildings, western bathing experience started to be regarded more of an individual activity, dominated by one material - tiles. All Tröpfelbäder that I have visited over the course of the thesis were up until the entrance in the Sauna completely dominated by tiles. From historical hygienic point of view - a justified choice, however impoverishing the bathing experience. High reflectiveness and brightness of the tiles which are used distract the attention all to focused on visual flaws. During the rise in individuality of bathing experience, middle east Hammam and Japanese Santōs have all experienced a decline in use too.

Fig. 56 Dianabad, the steel construction from the swimming hall, c. 1843

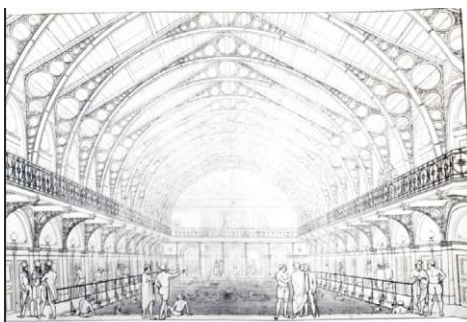


Fig. 57 The swimming hall from Sopihiabad as Ballroom



⁸¹ Europaverlag, 1987, Wiener Bäder, p.39

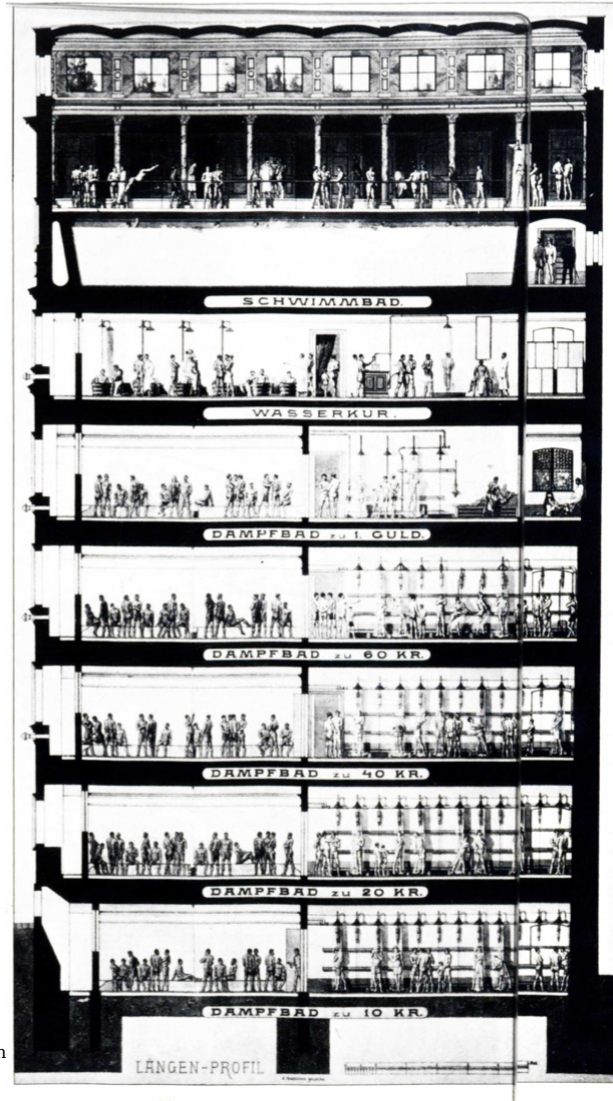


Fig. 58 Long section of Esterhazybad

● Middle-Age bath huts (Stuben) of which many presumably located in the vicinity of the todays Stadtpark, hence the name Stubenviertel and Stubentor.

Notable at least Badestube in der Singerstraße, das Bad am Roßmarkt (Stock im Eisen Platz) Das Neubad (Naglergasse), Röhrenbad (Kleeblattgasse 5).

● Bath houses on thermal sources (Kurorte) and on the danube river branch between 1780-1870.

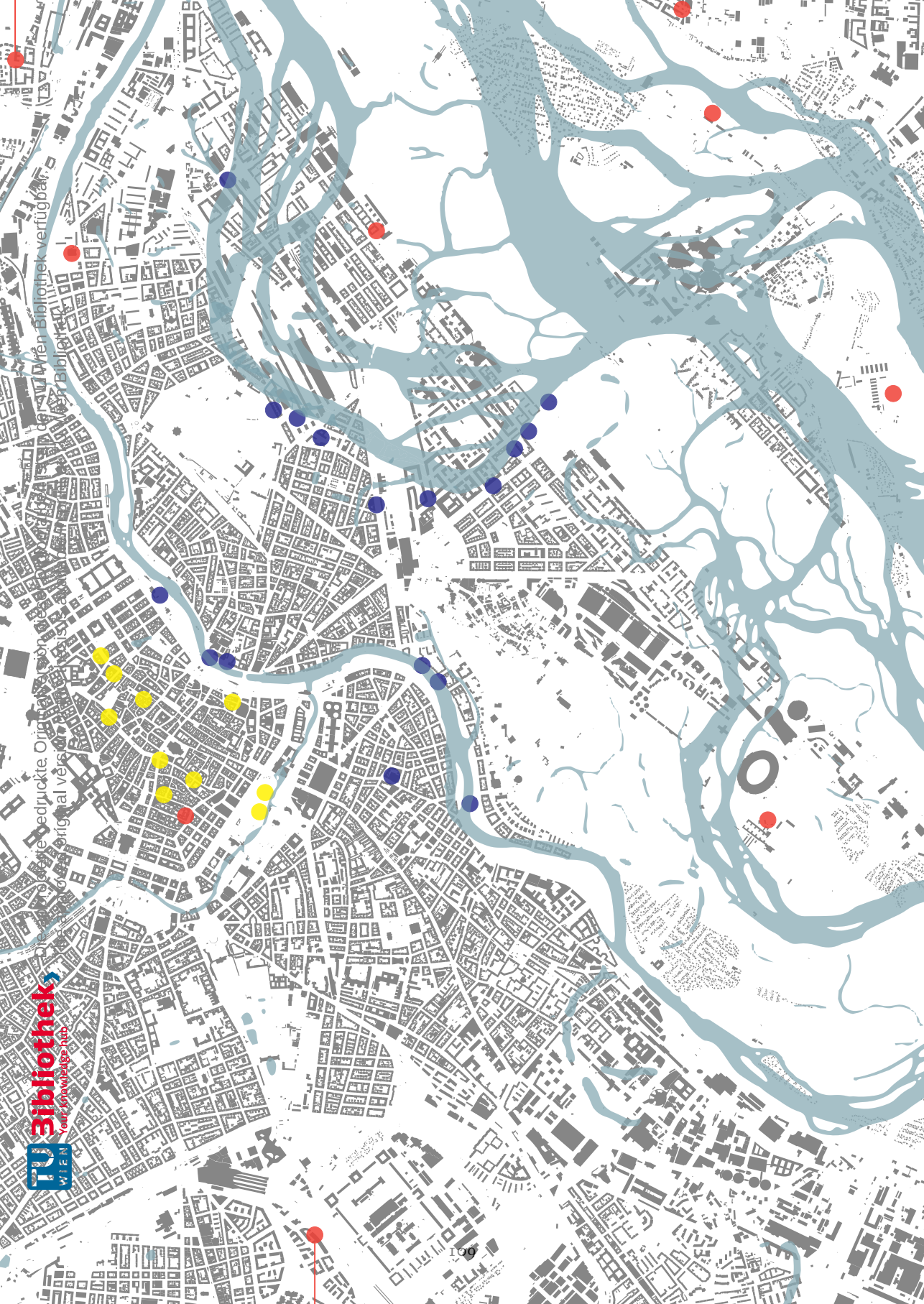
Among others Ferro'sche Bäder, Concordiabad, Freibad am Kaiserwasser, k.k Militärschwimmschule. At still unchanganged Donau canal: Dianabad, Kaiserbad, Bad am Schüttel, Strombad bei der Franzesbrücke.

Thermal baths: Heiligenstädter Heilquelle (one of the most prominent guests were L.V. Beethoven, F. Schubert), Ther-esienbad, Pfann'sches Mineralbad, Döblinger Heilbad,

● Second half 19th and 20th Century Tröpferbäder and other historic bathhouses some of which still in use: 5. Einsiedlerplatz, 6. Esterhazygasser, 7. Mondscheingasse, 10. Amalienbad, 14. Hütteldorferstraße, 17. Jörgerbäd, 21. Floridsdorferbad, 19. Krapfenwaldbad, 22. Strandbäder, and 1. Römisches Bad, exceptionnally built in Historical style with a steam and hot air bath.

Fig. 59 Vienna, with historical Danube's arms and bays, with disposition of public baths through three time periods.





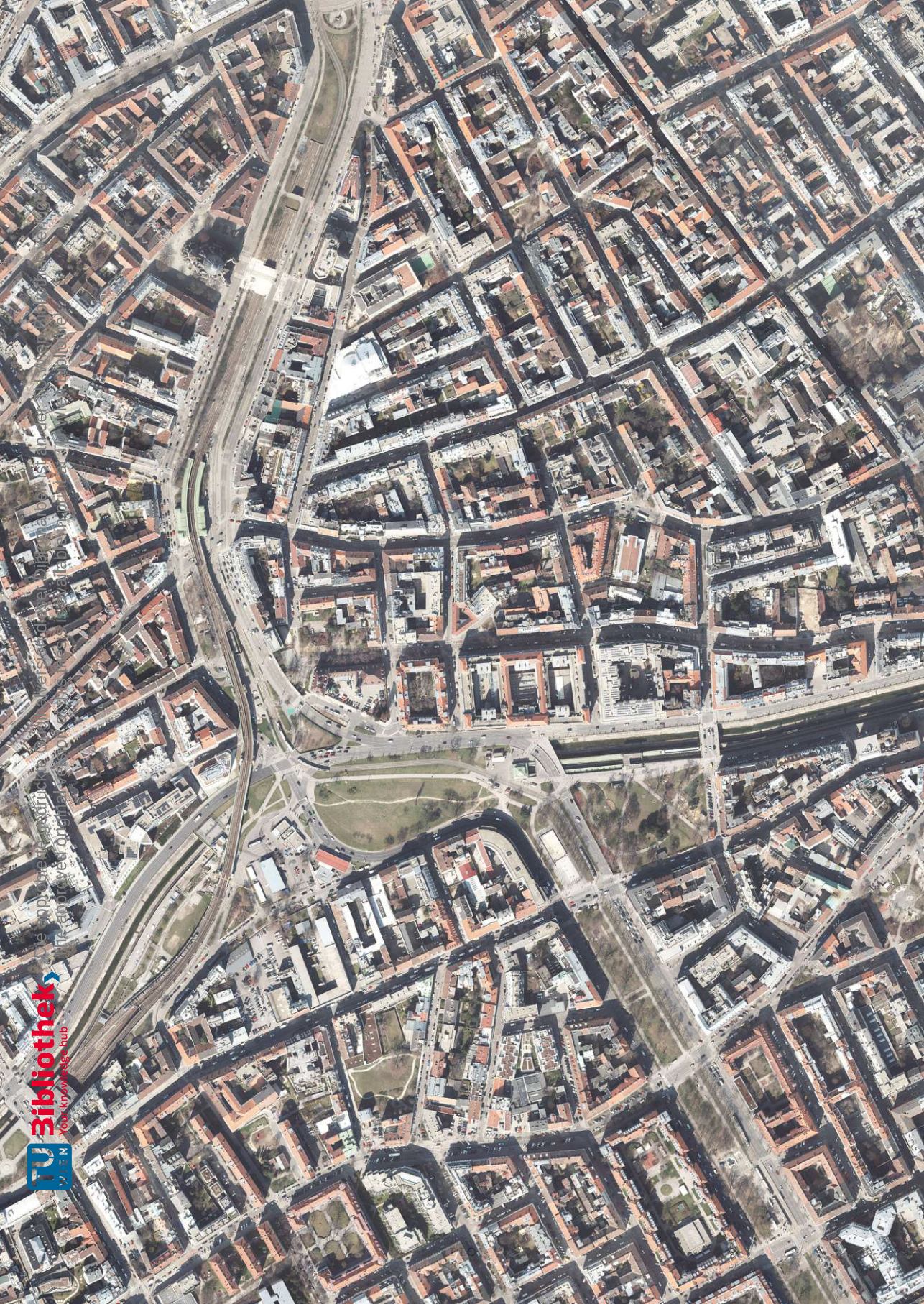


Fig. 60 Satellite Image of Vienna

The saturation with horizontal movement, with only exceptions of the sculptural pillars of the Otto Wagner's bridge and Kaufmann's vertical façade, there emerges the need for a counter movement, namely the vertical body that can relate to the given surrounding, and further away, until the Vienna's silhouette of the skyscrapers in the 12th district. This bridge, however, is stripped of its essence in a way. Usually, it connects two sides of landscape separated by a natural element that presents itself as an obstacle in movement. Here, it overarches the man-made elements that seem indefinitely spread, and not an obstacle. Its beginning and ending is unknown, or at least not perceived with clear departure and arrival points. Historically, Vienna river has formed the town's border and up until the 19th century its protective fortifications were erected just along its riverbanks. On the one side, the town's historical core, and on the other its rapidly developing suburbs and its more industrial character. During the industrial time, the river was used mainly as a waste water channel towards Danube used by textile industry and gas production. For a result, the picture of a river and fortification walls we would have imagined would not be as idyllic as we think. Otto Wagner's railway bridge, rather than overarching the two sides, allows the connection and movement underneath. The horizontal movement of the river and perpendicular fortifications combined with the vertical decorated pillars don't quite "gather the earth as landscape around the stream" but it surely gathers what "man has contributed to the place, as a townscape of unique quality."⁸²

Fig. 61 Historical layers

Liniewall in 1829

Traces of former Vienna river

⁸² Norberg, 1991, Genius Loci, p.82





Fig. 62 Left: Folder sheets of the Franciscan land registry, Vienna Innere Stadt 15, 18, 19, 21, 22 (source: Federal Office for Metrology and Surveying, recorded in 1829)

Fig. 63 Above: Ferdinand von Staudenheim
"Leben und Treiben auf den Linienwällen"
1894



Fig. 64 Wienflussregulierung 1894 - 1900, Gaudenzdorfer Gasworks, 5.3.1897

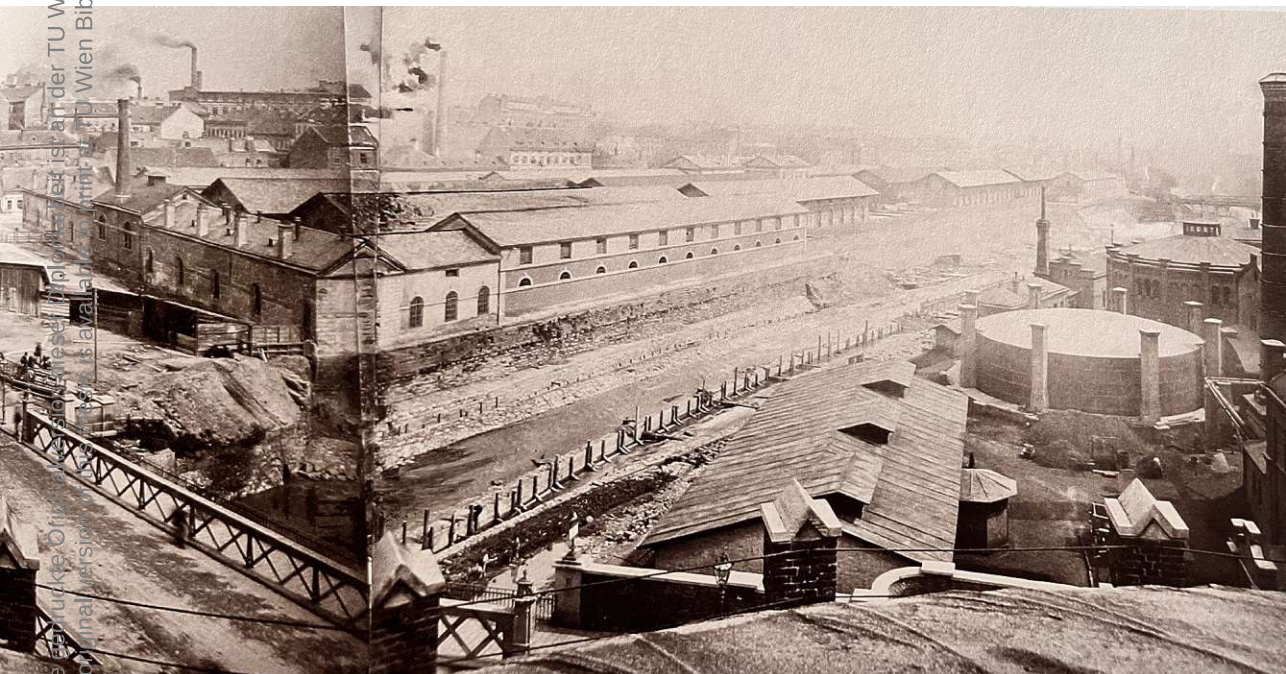
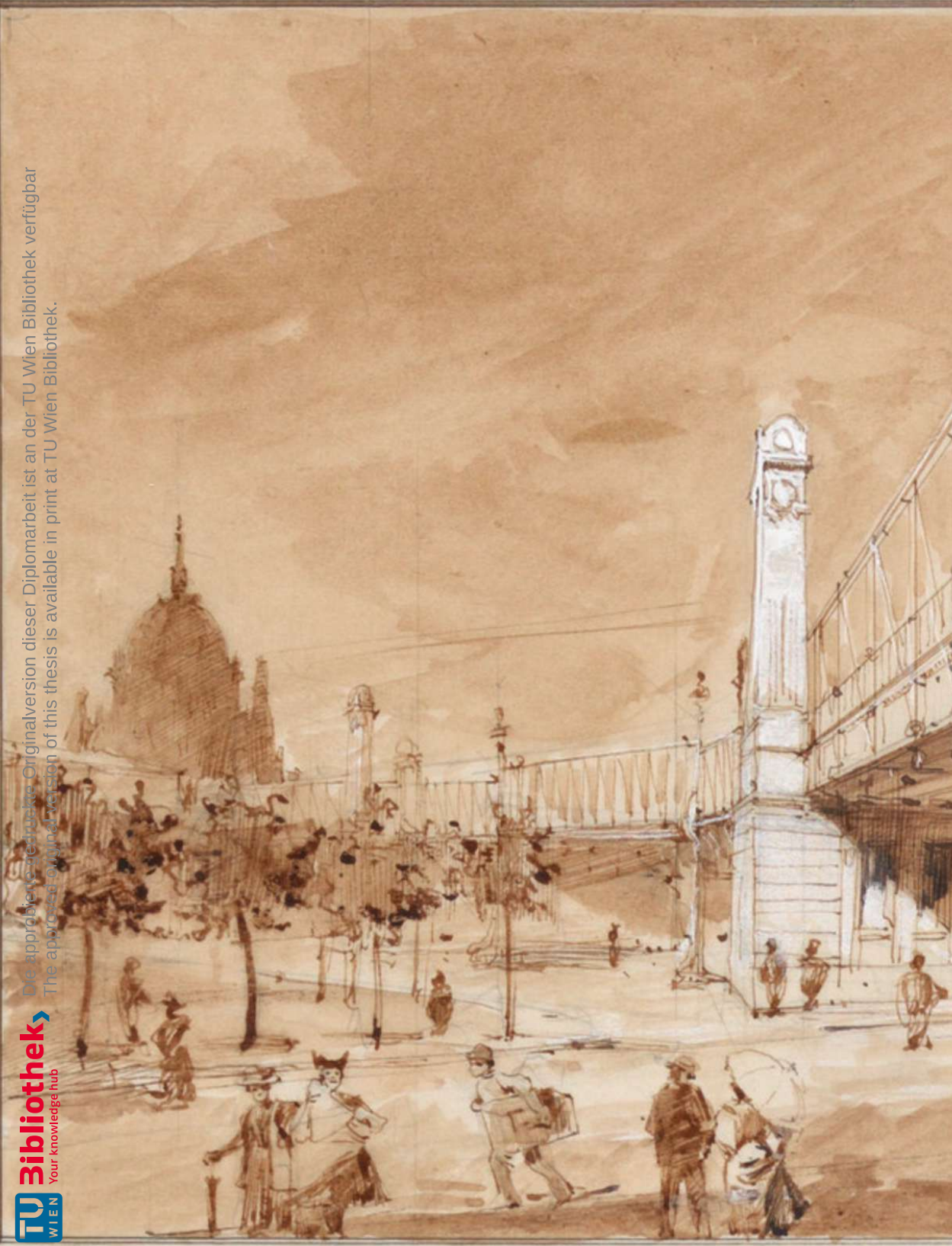
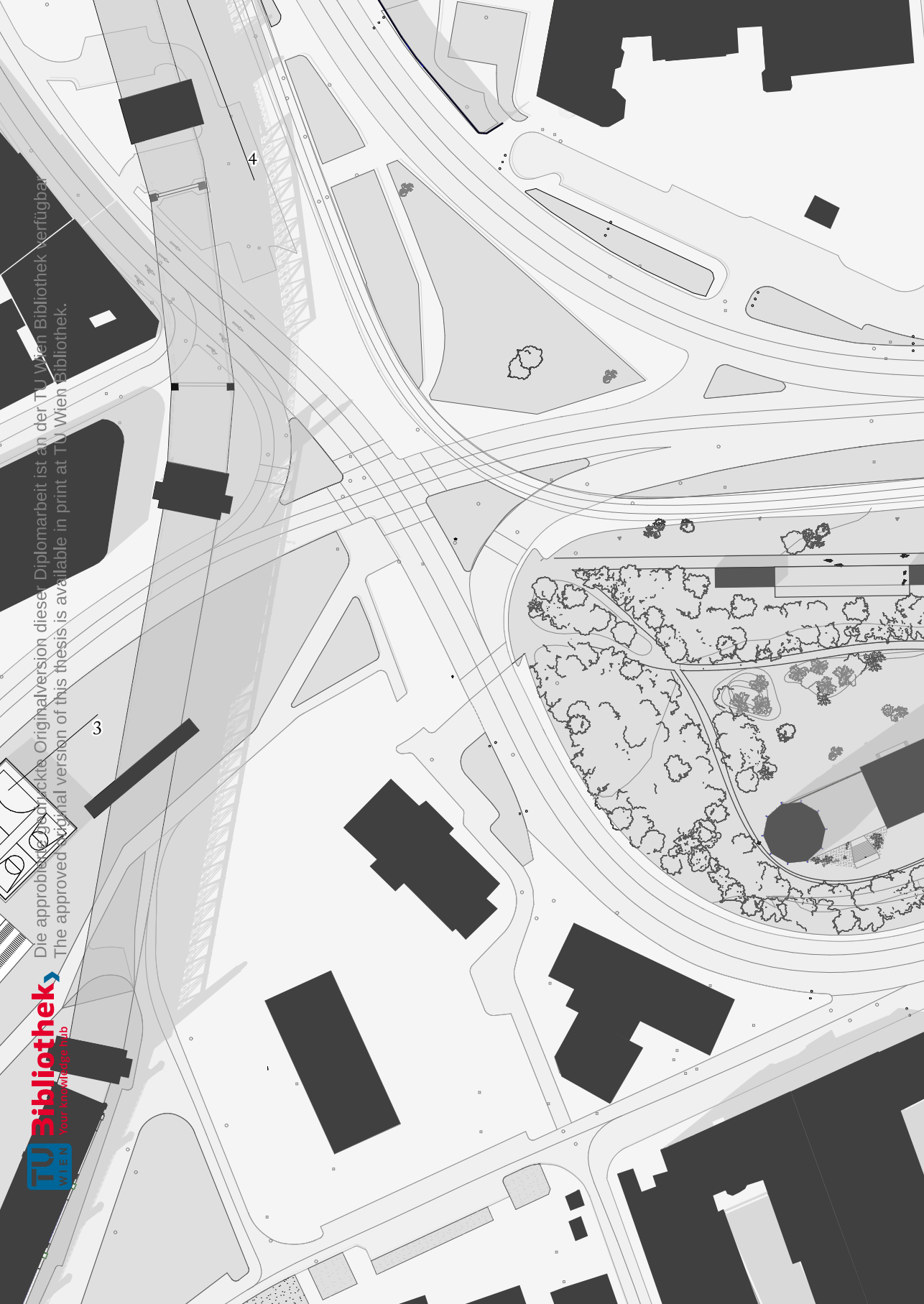


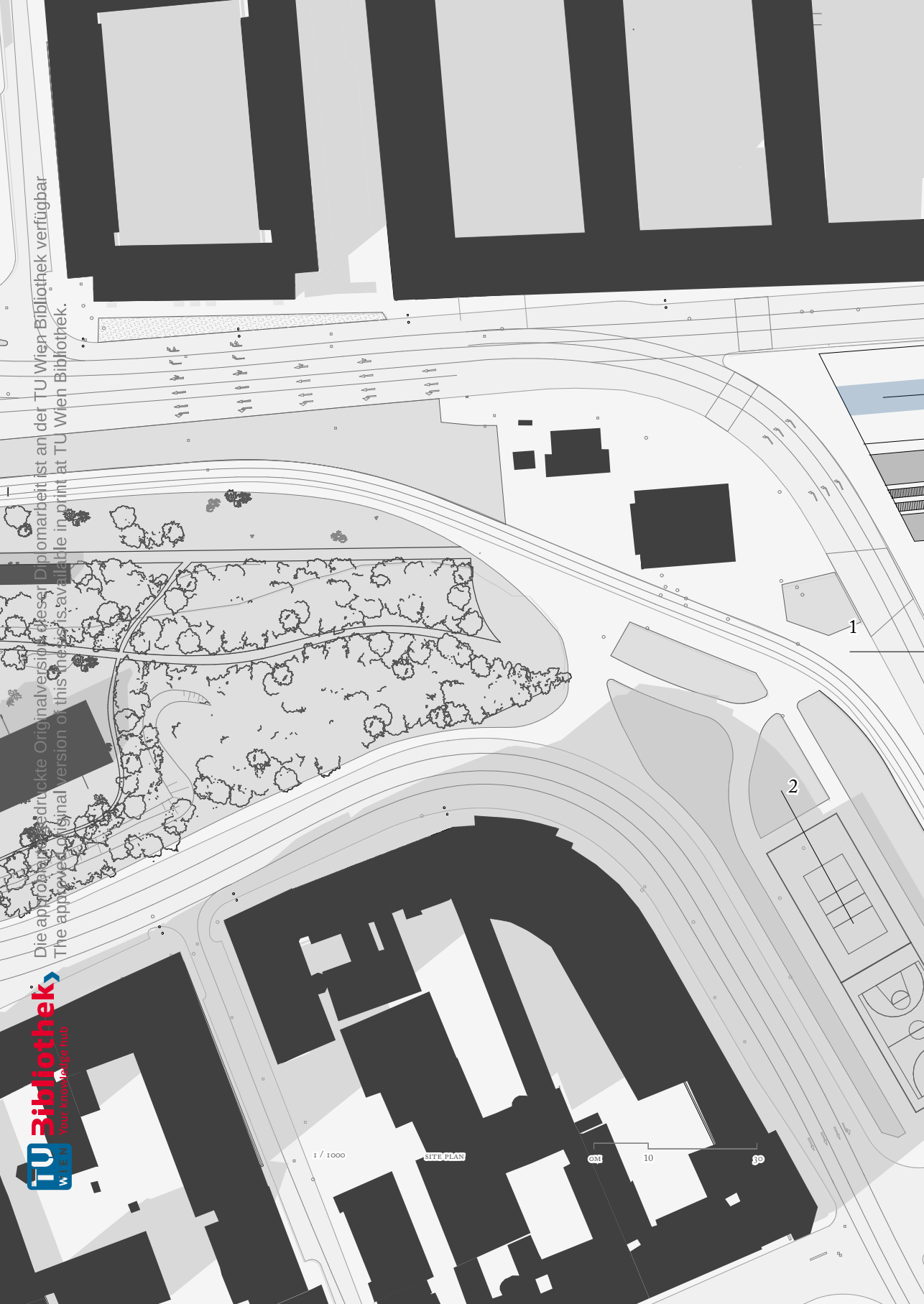
Fig. 65 From the roof of a gasometer at the Gaudenzdorfer gasworks there is a view of an urban space that is now hardly recognizable and once was characterised by industry and commerce. The Gumperdorfer slaughterhouse was demolished in 1907 and the gaswork shut down in 1911. Albert Stächelin, Bau der Wientallinie zwischen Herzl-Hof und Schlachthausbrücke, 2. August 1896

Fig. 66 (page below) Railway bridge concept, Otto Wagner, 1896









1 / 1000

SITE PLAN

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Fig. 67 City Railway Bridge today, 2023



Fig. 68 Access to the site from the Bridge



Fig. 69 Leisure at the site

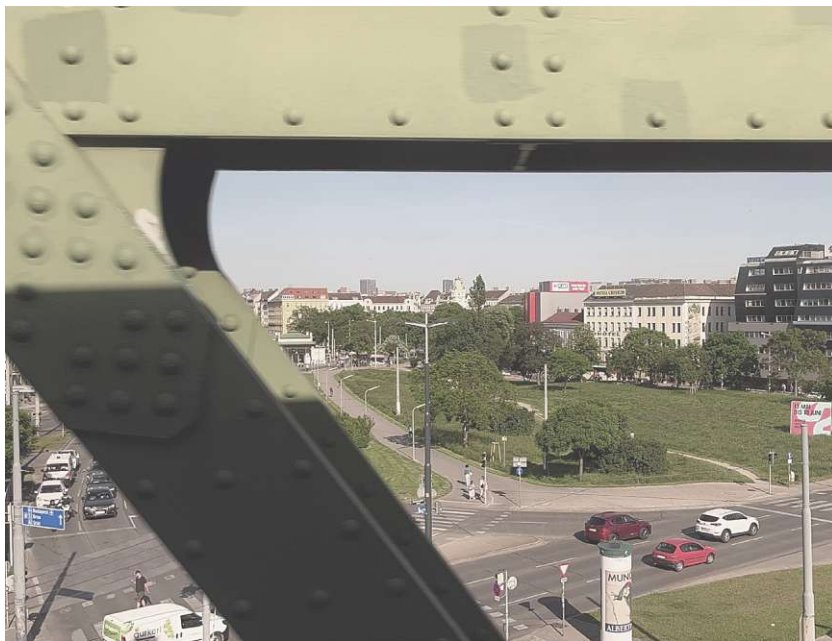


Fig. 70 View from the U6 metro



Fig. 71 One of the Otto Wagner's metro stations - U4 Margareten, former commercial training school in the background



Fig. 72 View from the site towards
Margaretengürtel station



Fig. 73 Unpredictability, Lago ex Snia, Rome, 2019

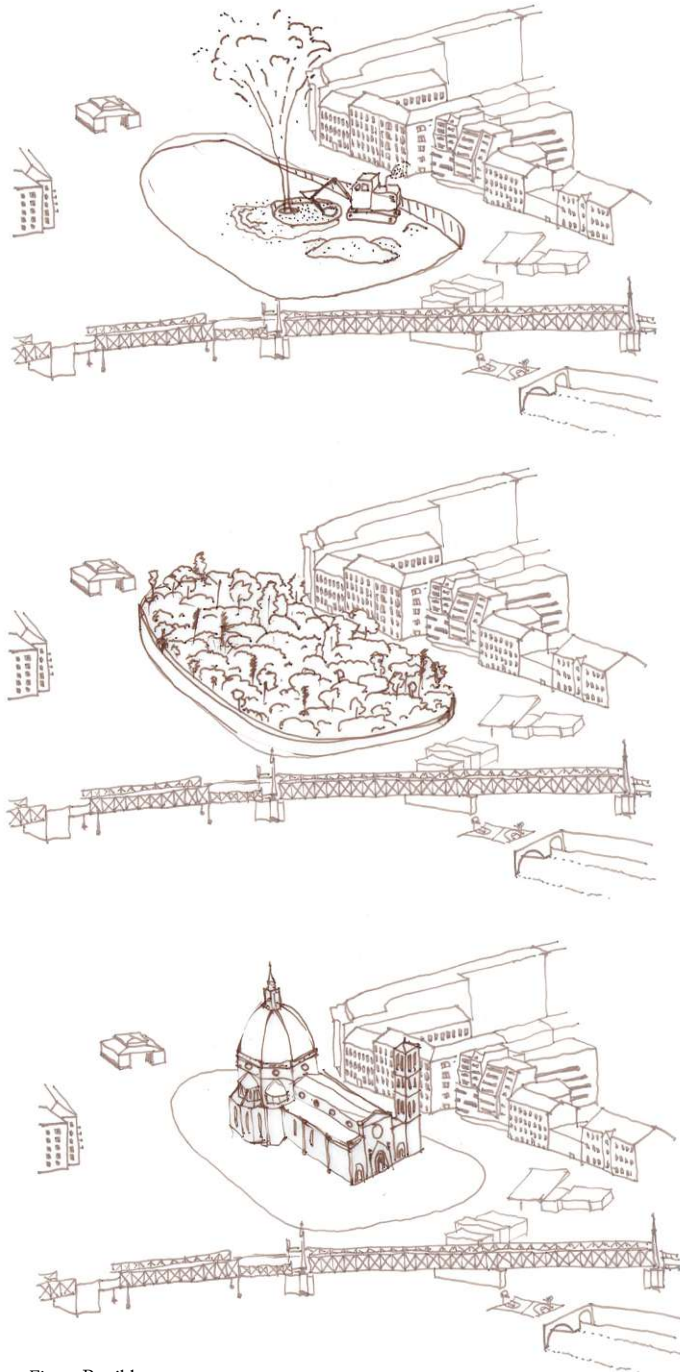


Fig. 74 Possible outcomes

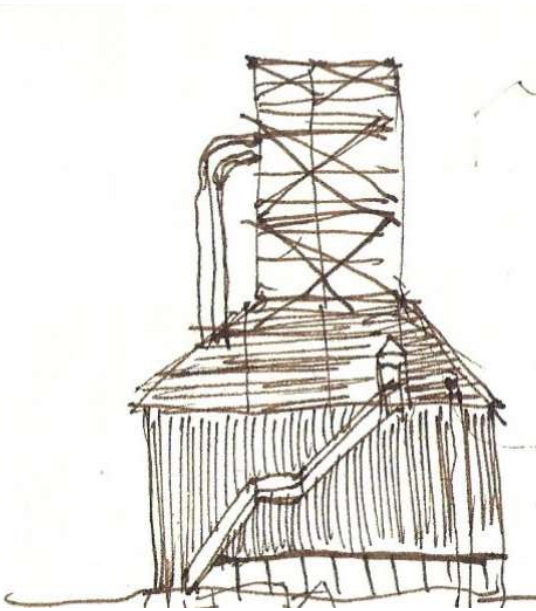


Fig. 75 Finding expression

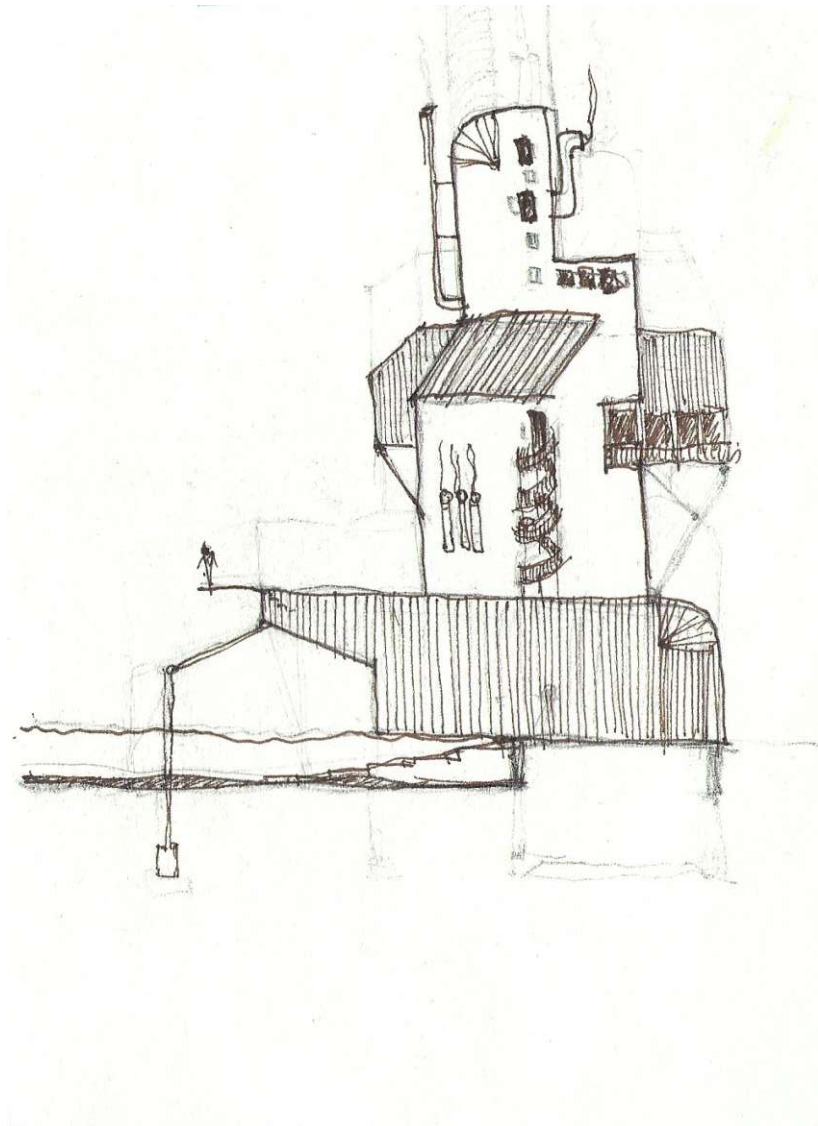




Fig. 76 Bruno Kreisky
Park



Fig. 77 St. Nepomuk Chapel,
Schönbrunnerstraße



Fig. 78 Margaretengürtel station from Bruno Kreisky Park



Fig. 79 Detail of the wall's corner at the station.



Fig. 8o Margaretingürtel



Fig. 81 Gumpendorfergürtel

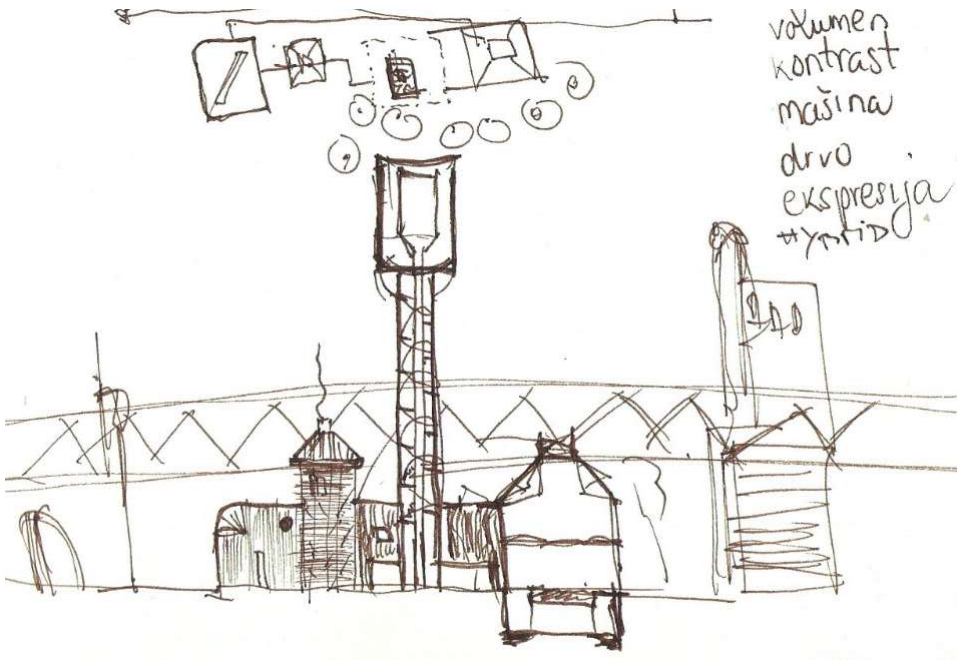


Fig. 82 Horizontal vs. Vertical

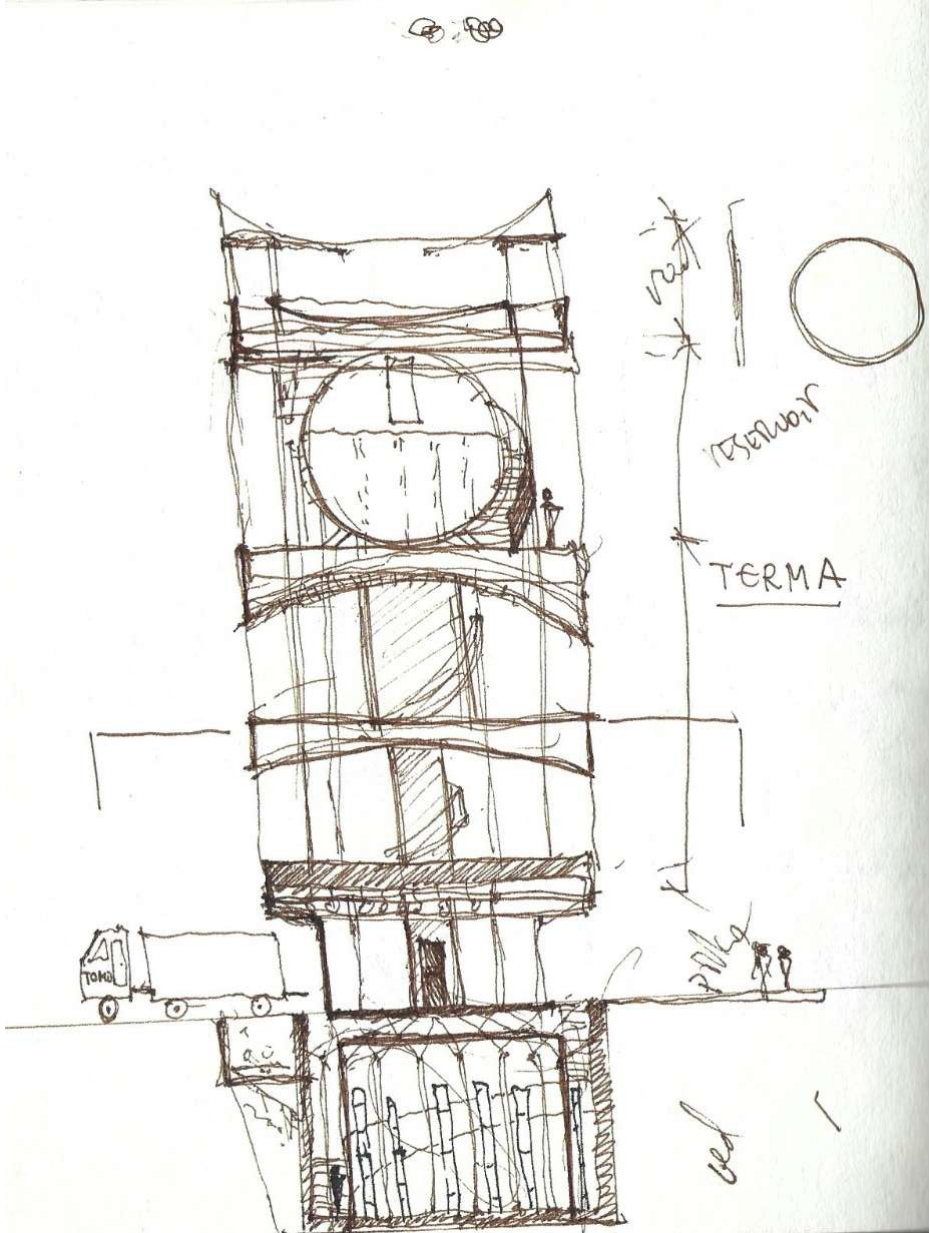


Fig. 83 Production of leisure



Fig. 84 Vienna river



Fig. 85 Public playground



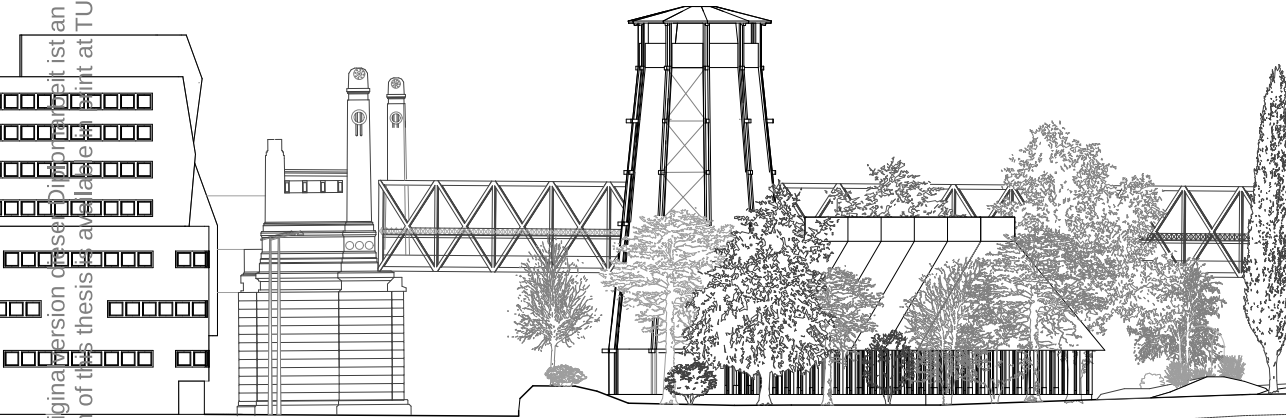
Fig. 86 Residential building Leuthner
Hof



Fig. 87 The site

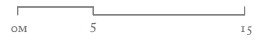
Fig. 88 Afternoon gloom

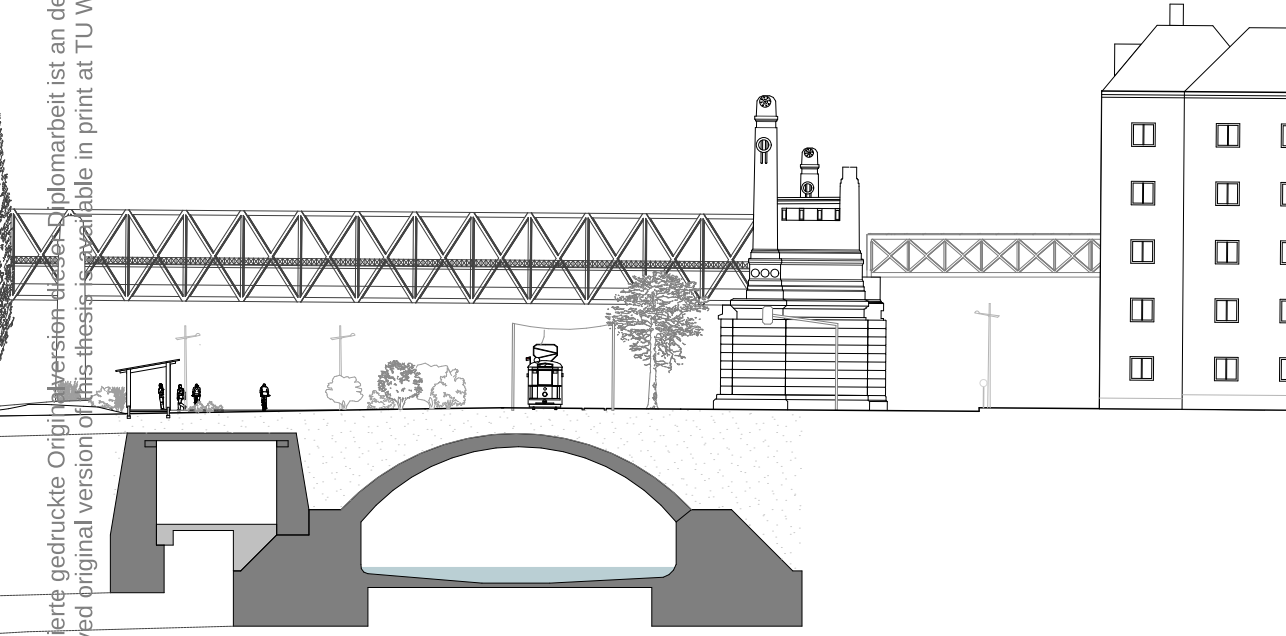




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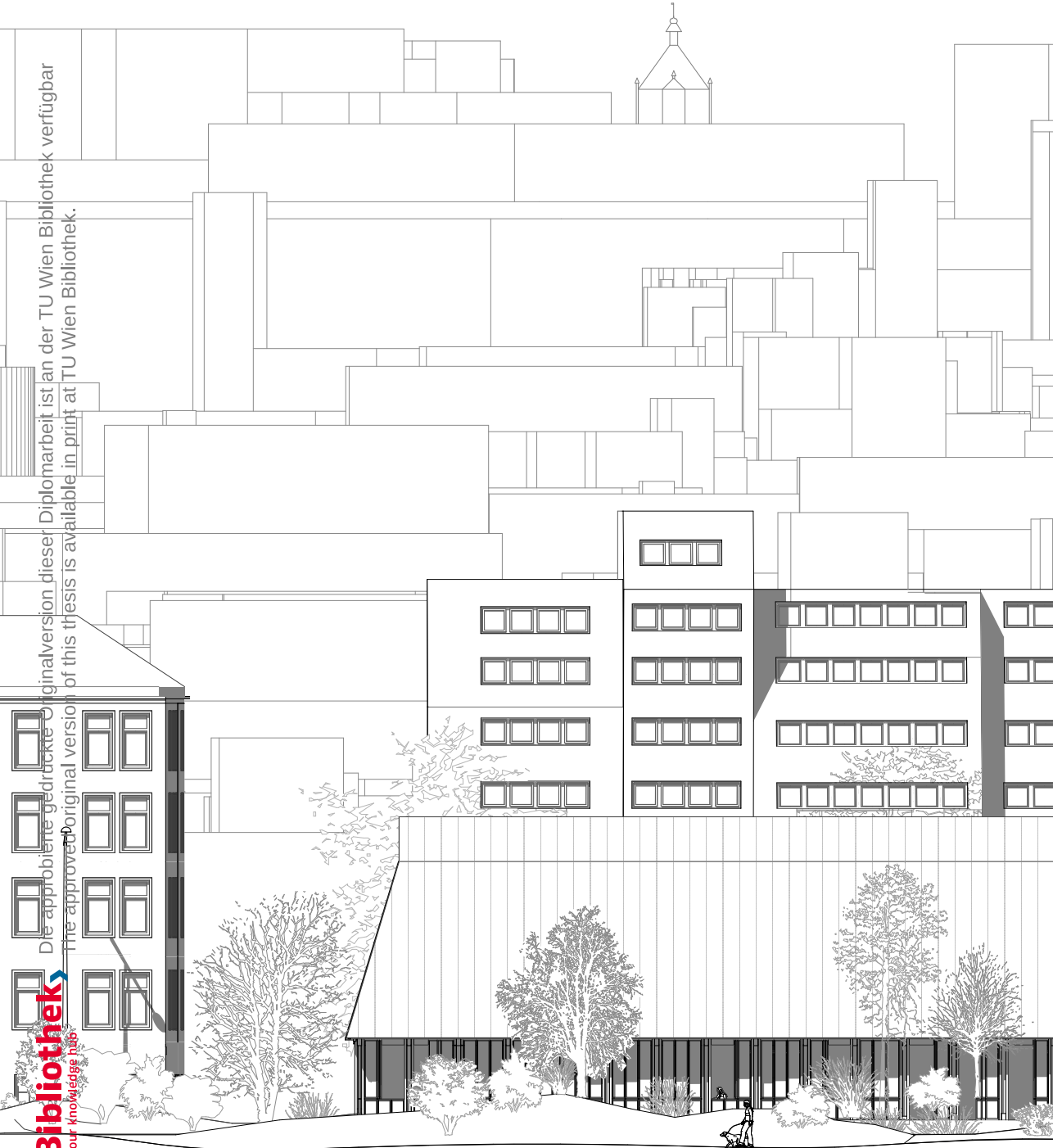
CROSS SECTION





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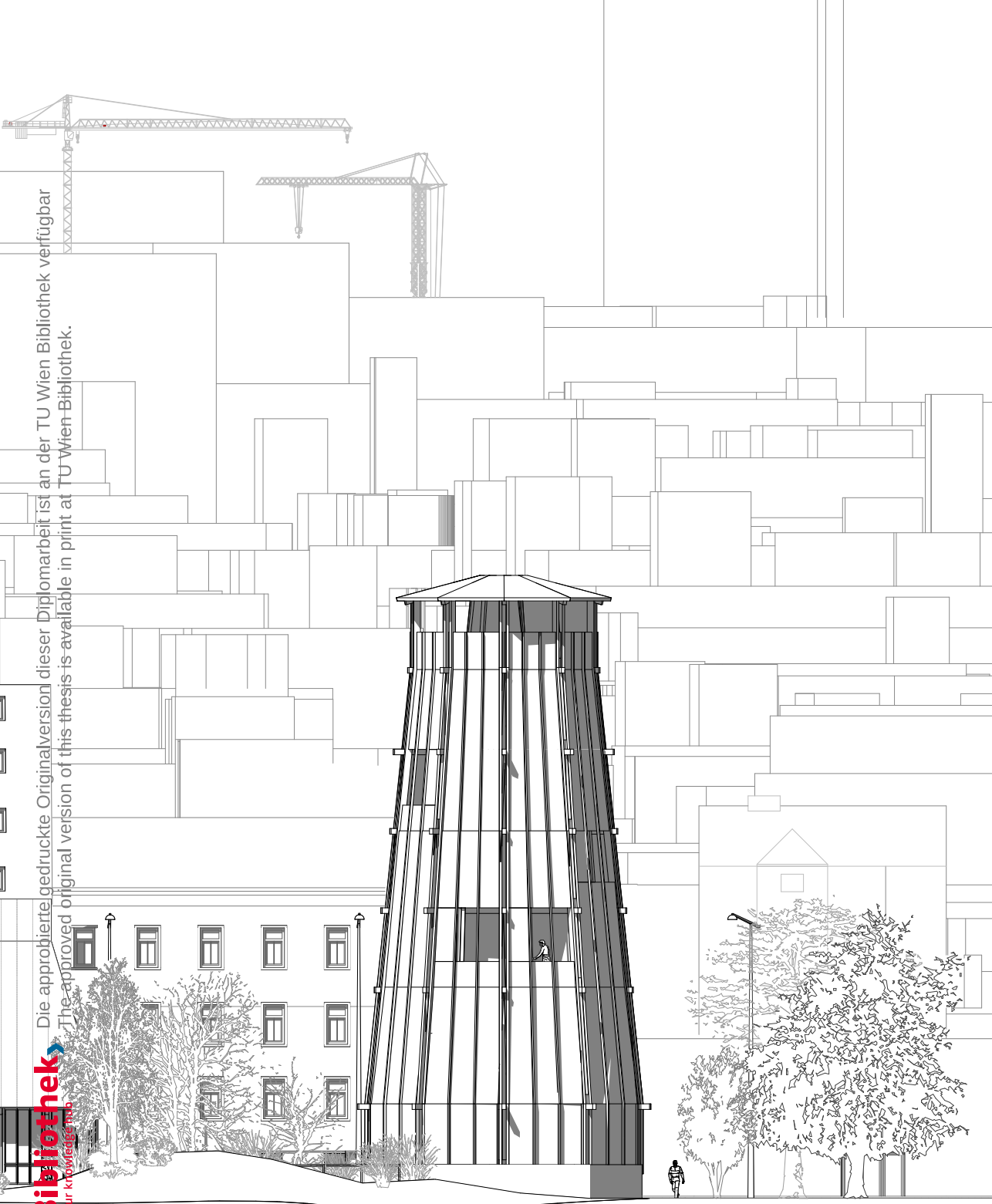


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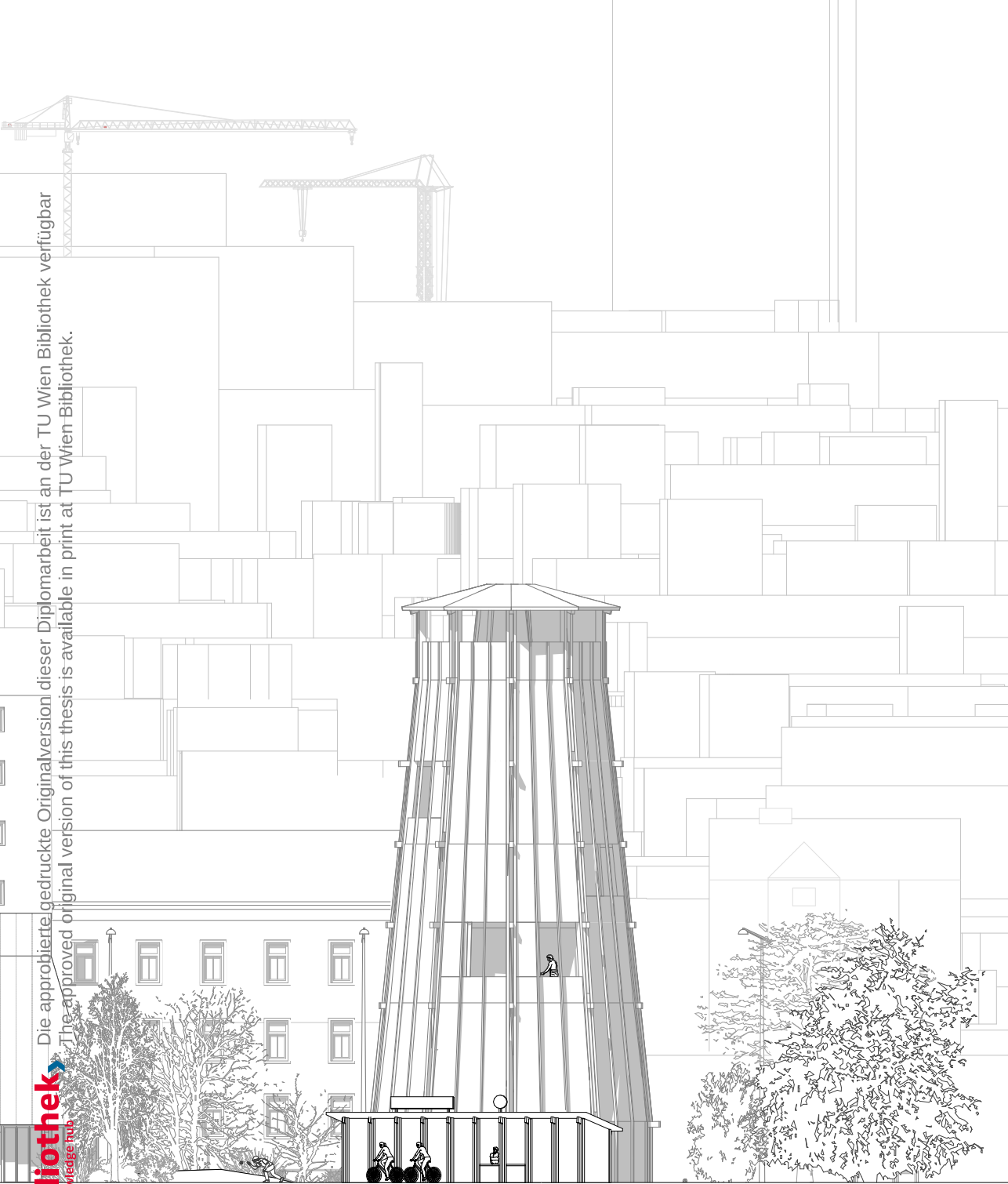




Fig. 89 Wooden Attic

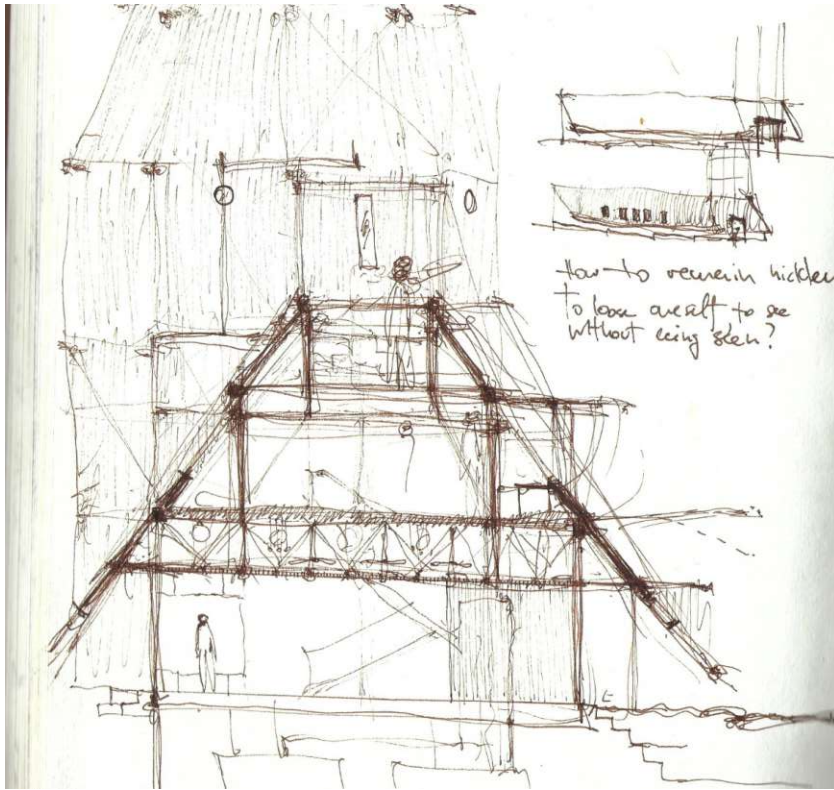


Fig. 90 Roof Sketch

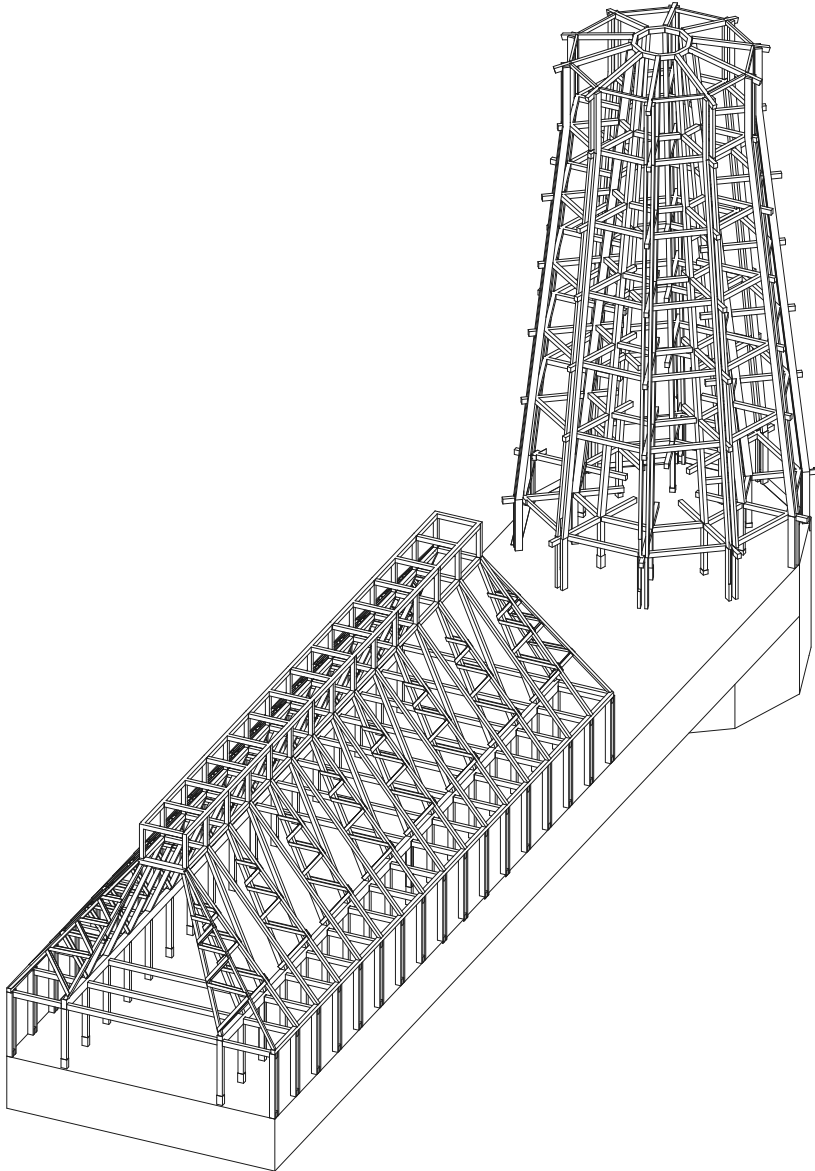


Fig. 91 Skeleton Construction isometric

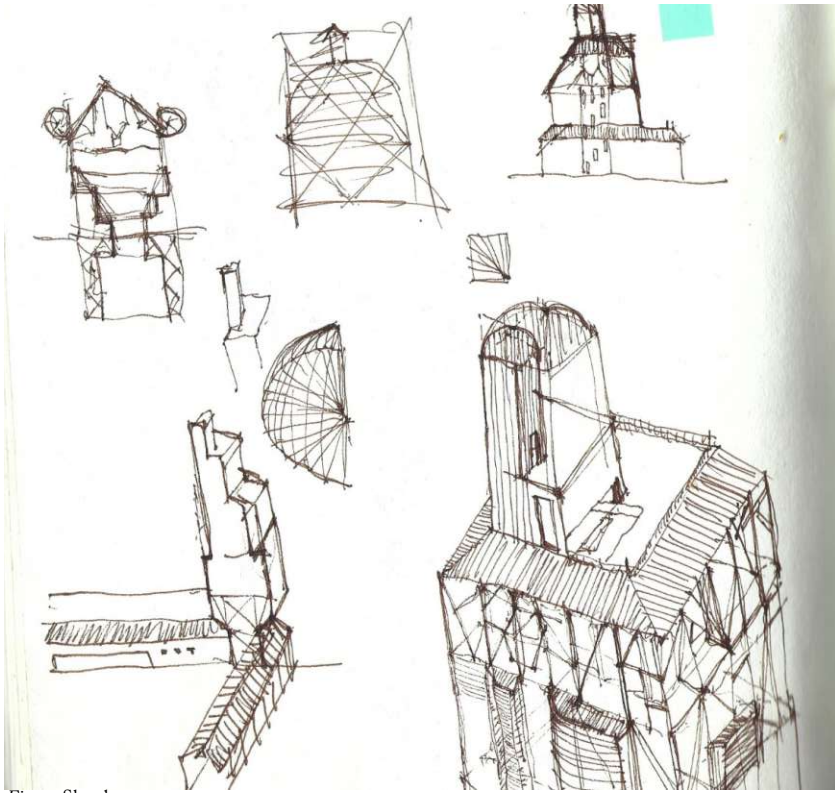
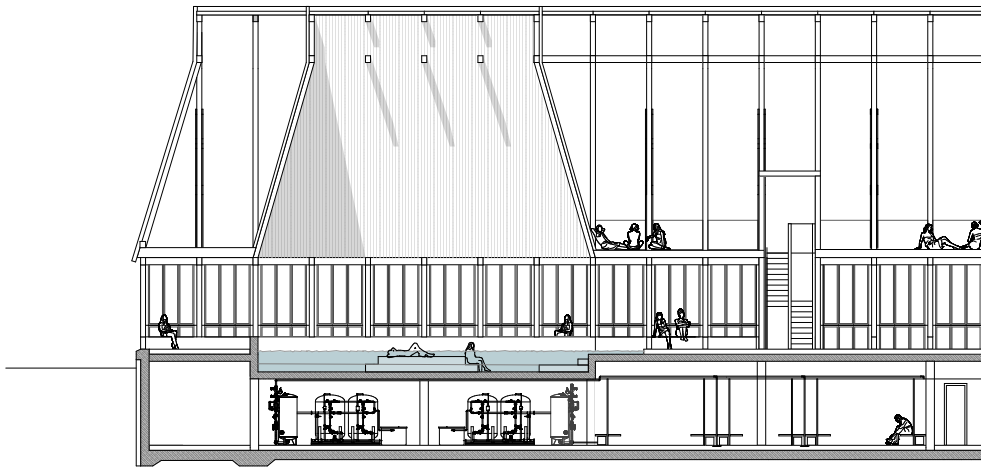


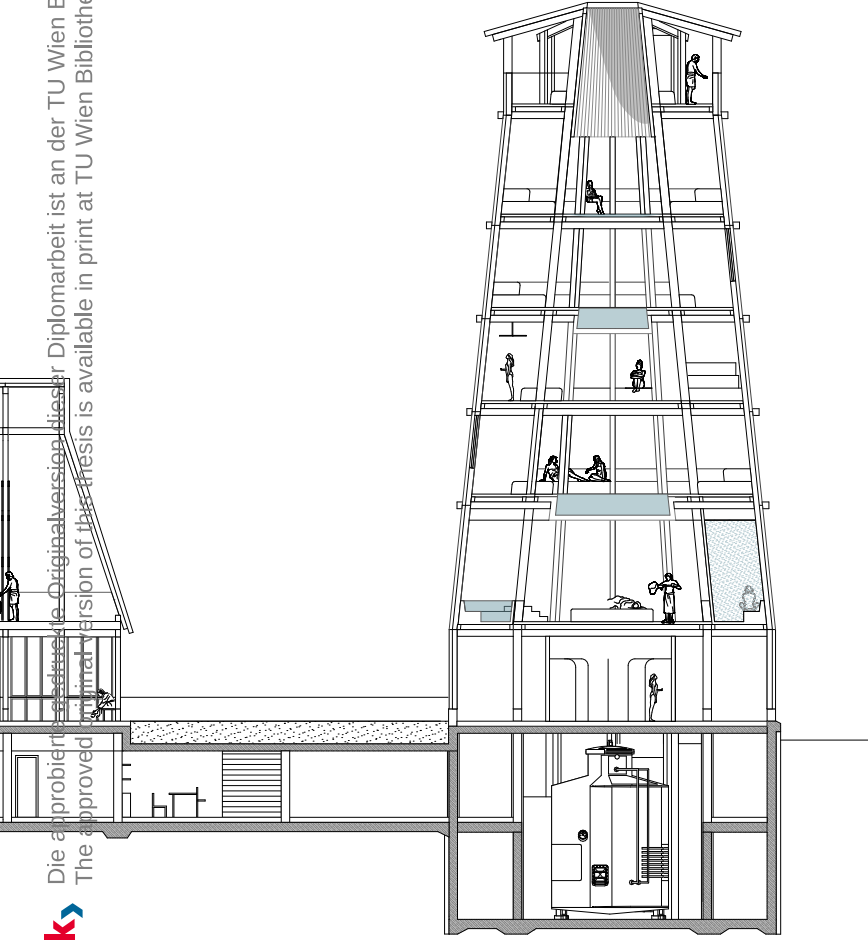
Fig. 92 Sketch



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LONGITUDINAL SECTION

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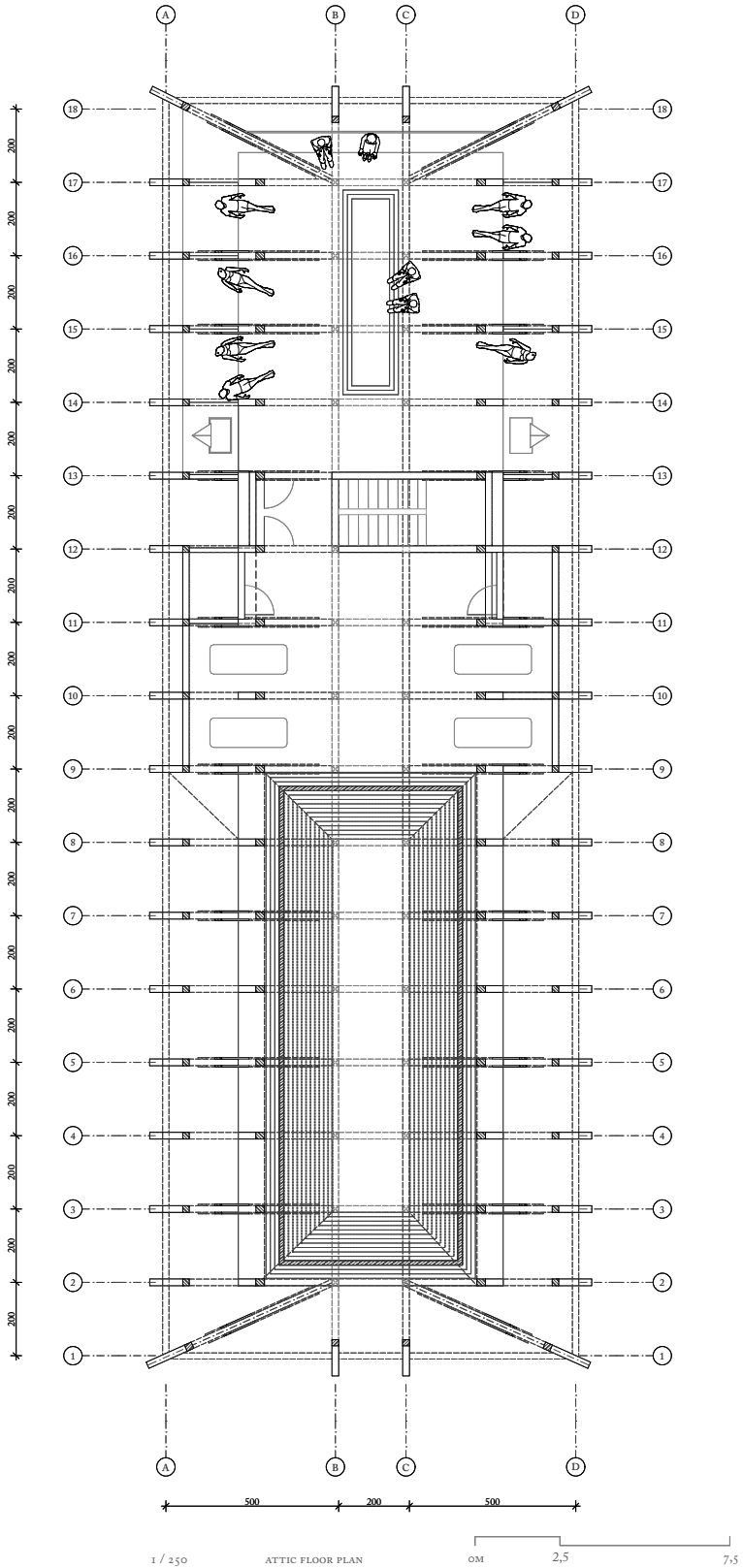




Fig. 93 Abstract forest



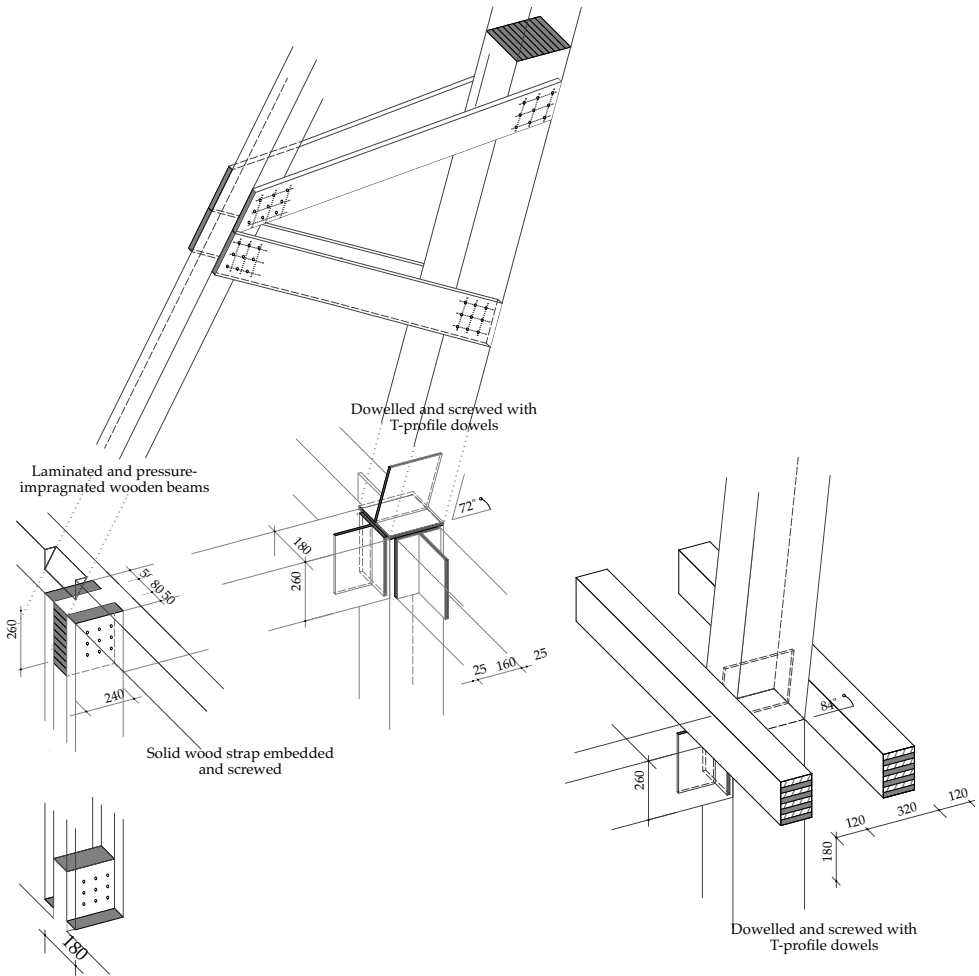


Fig. 94 Isometric construction joints

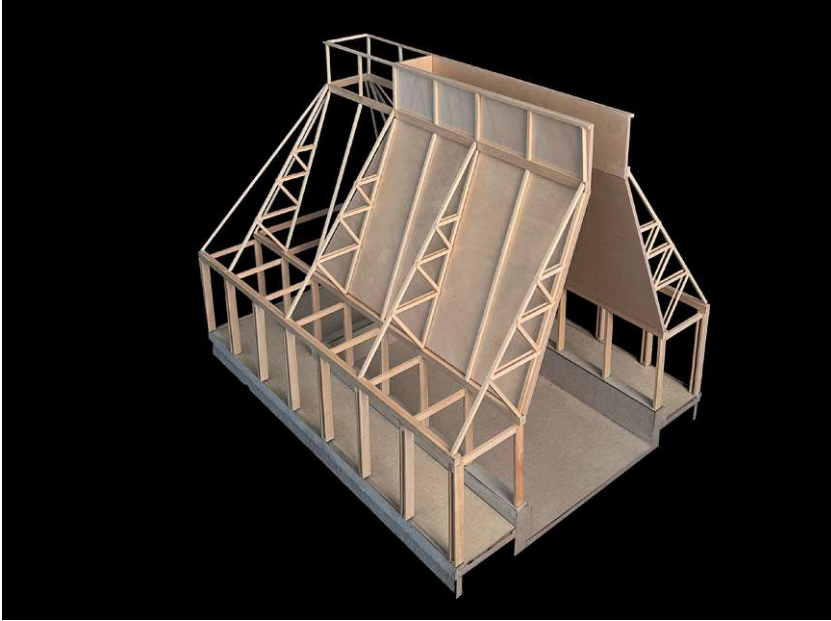
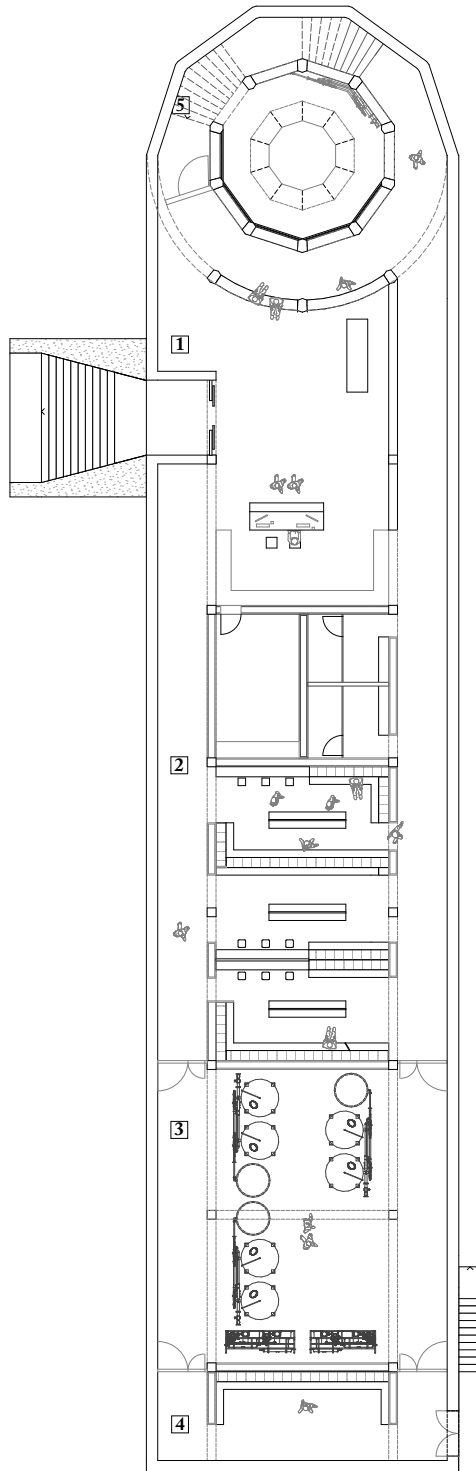


Fig. 95 Construction model



- 1 Entrance
- 2 Changing rooms
- 3 Apparatus
- 4 Changing rooms - staff
- 5 Heat storage

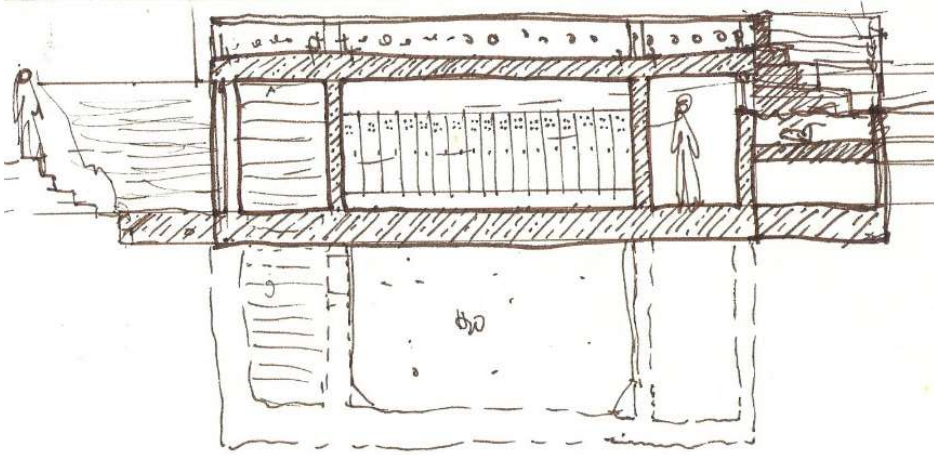


Fig. 97 Entrance situation, sketch

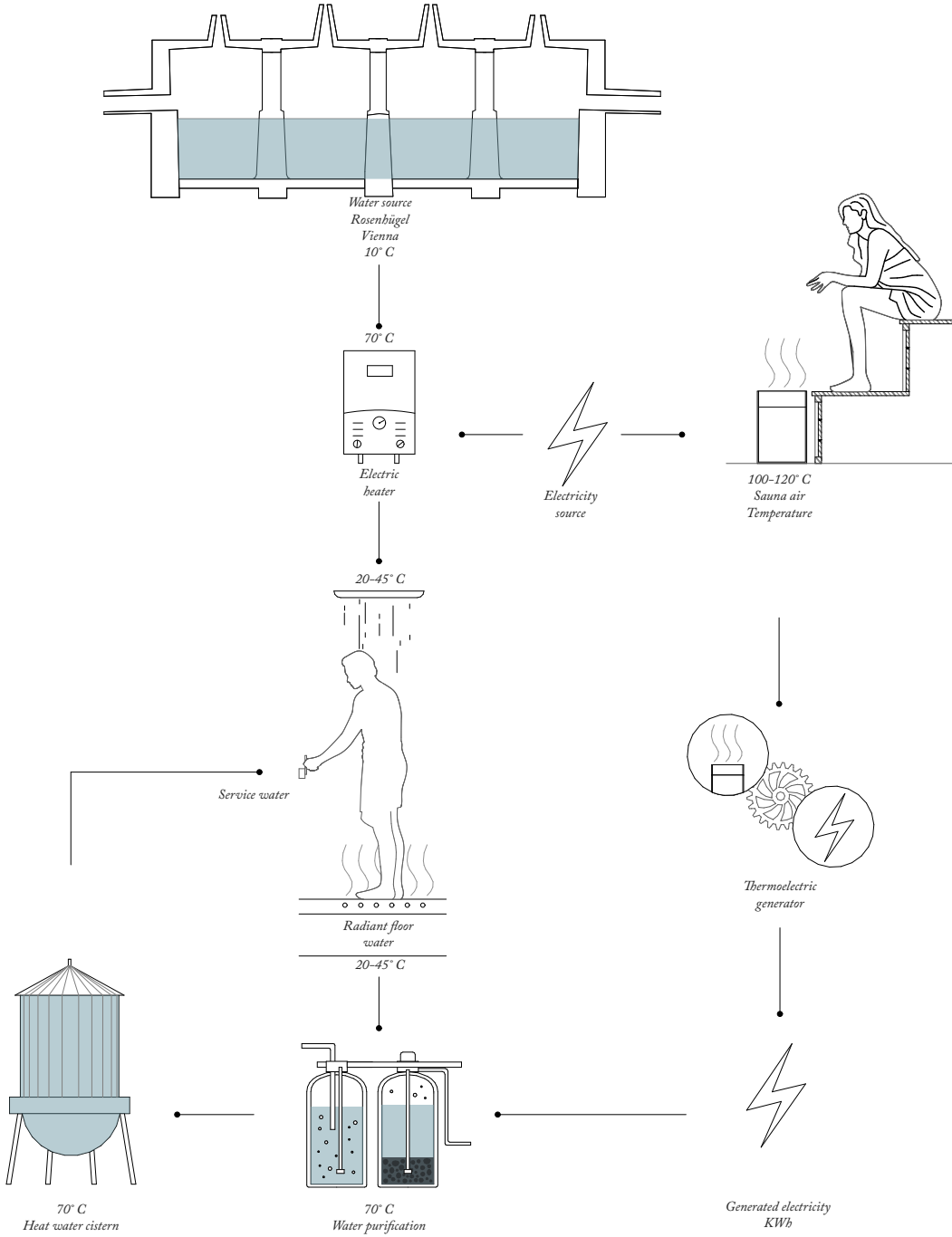
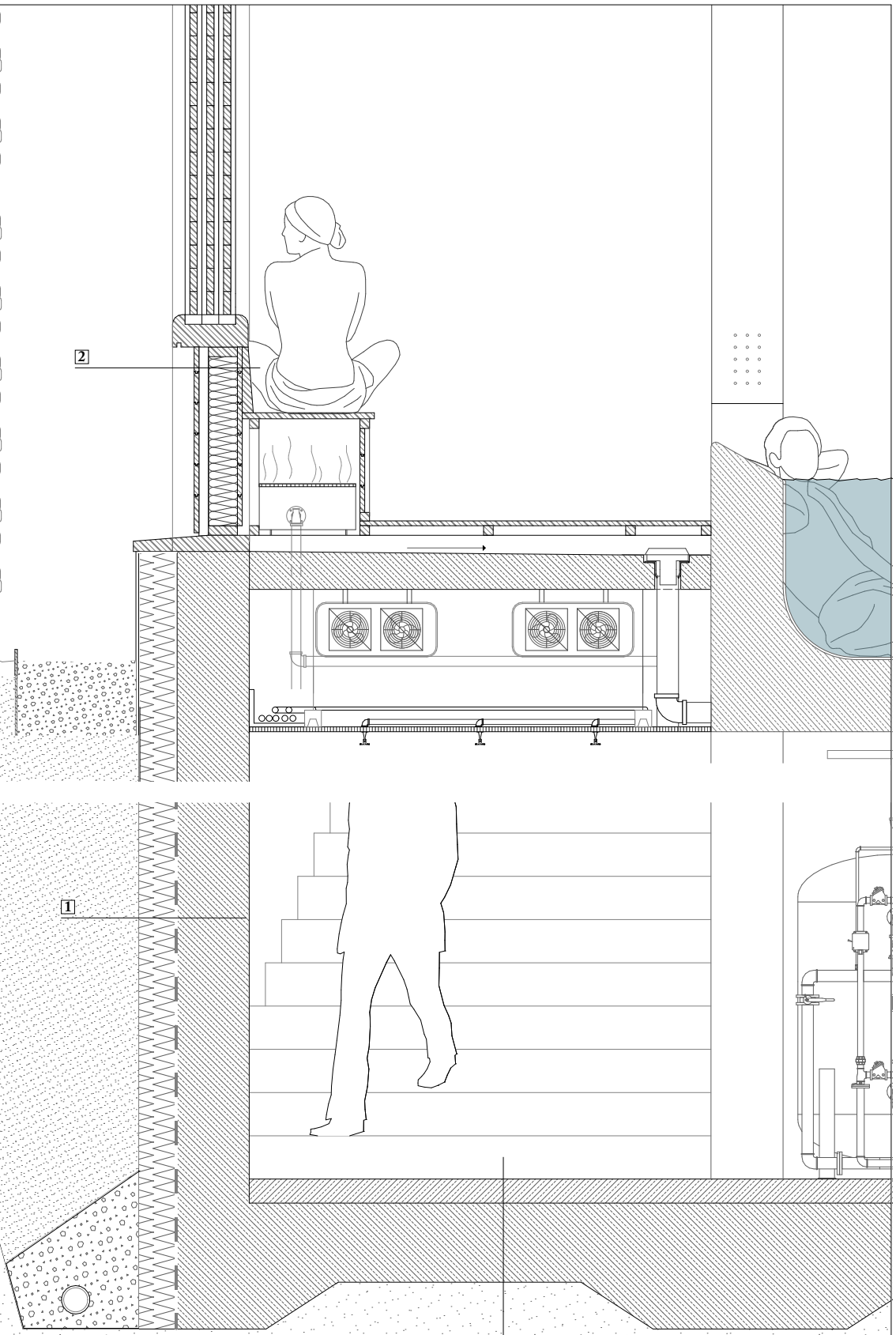


Fig. 96 Water technology concept



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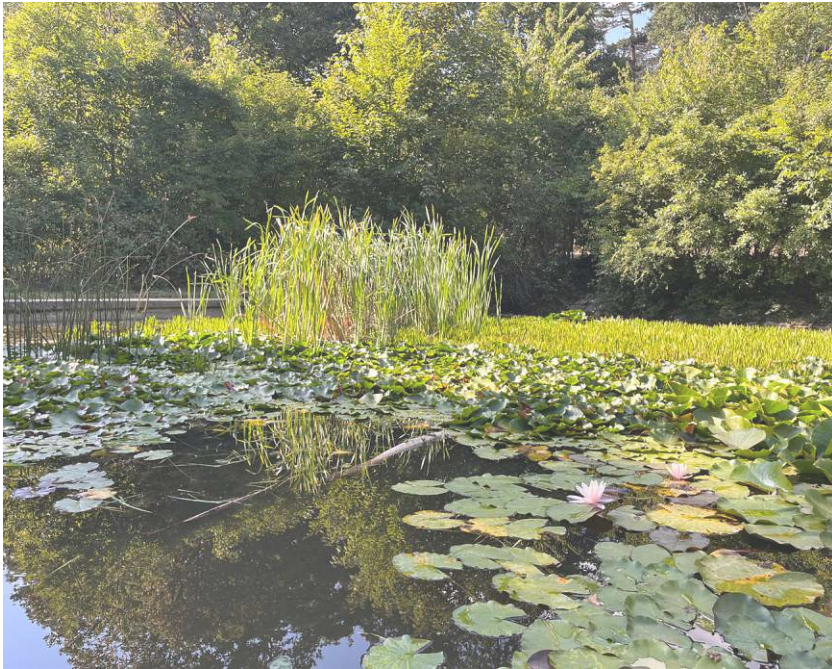
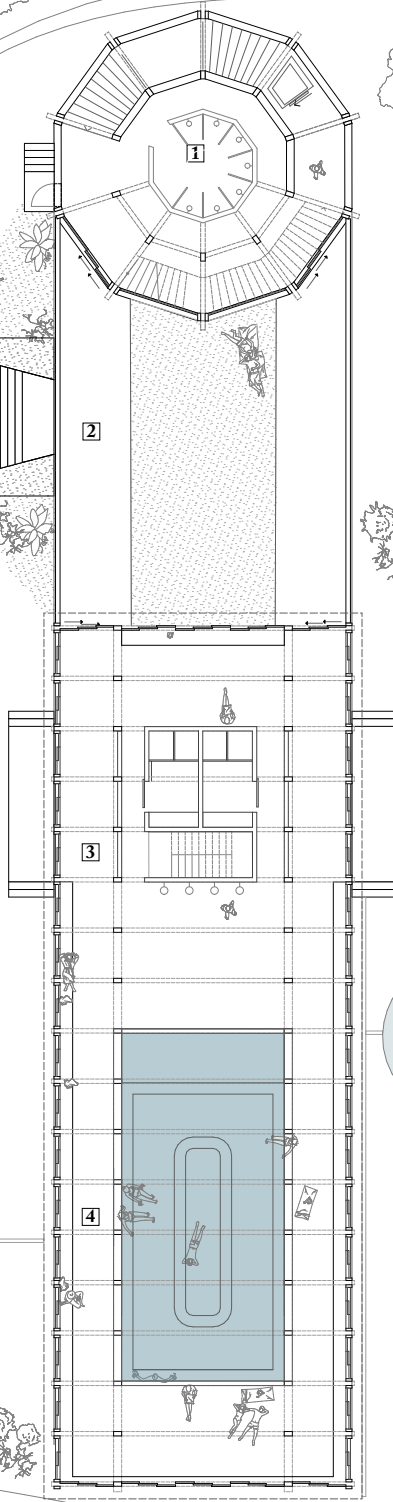


Fig. 98 Water lilies in Lainzer Tiergarten, 2022

- | | | |
|--|---|--|
| <p>1</p> <p>1 Water impermeable concrete 30cm, polished
2 Seal, 3 layers with root protection
3 Extruded Polystyrene (XPS) 16cm
4 Gravel 16/32 mm</p> | <p>2</p> <p>1 Wood cladding Larch, 3cm
2 Vapour barrier, -
3 Wood wool, 16cm, between battens
4 Air layer, 3cm
5 Wood cladding, Larch, 3cm</p> | <p>3</p> <p>1 Heated screed, 10cm
2 Seal, 1 layer
3 Water impermeable concrete, 35cm
4 Gravel layer, 15cm</p> |
|--|---|--|

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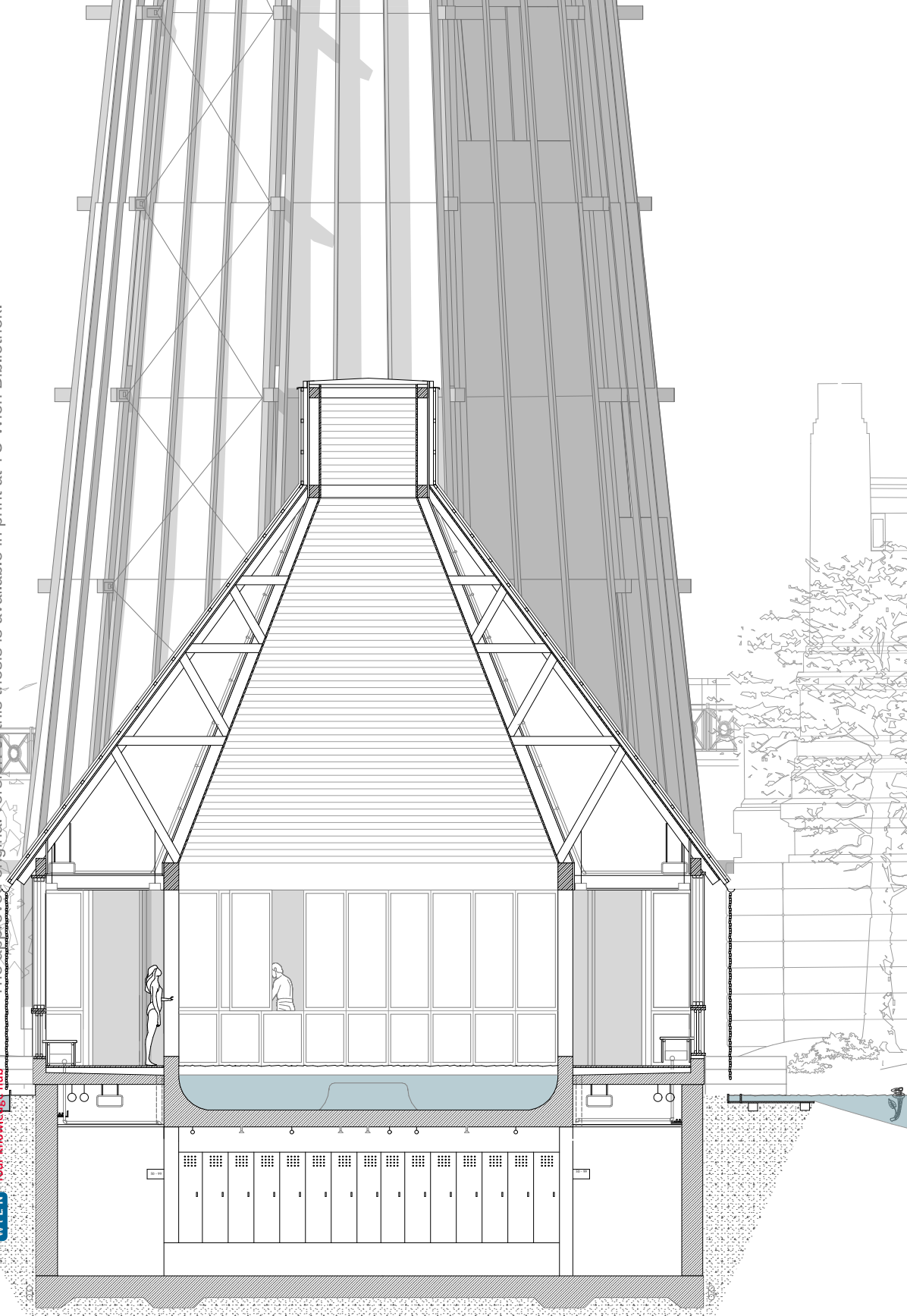
GROUND FLOOR PLAN



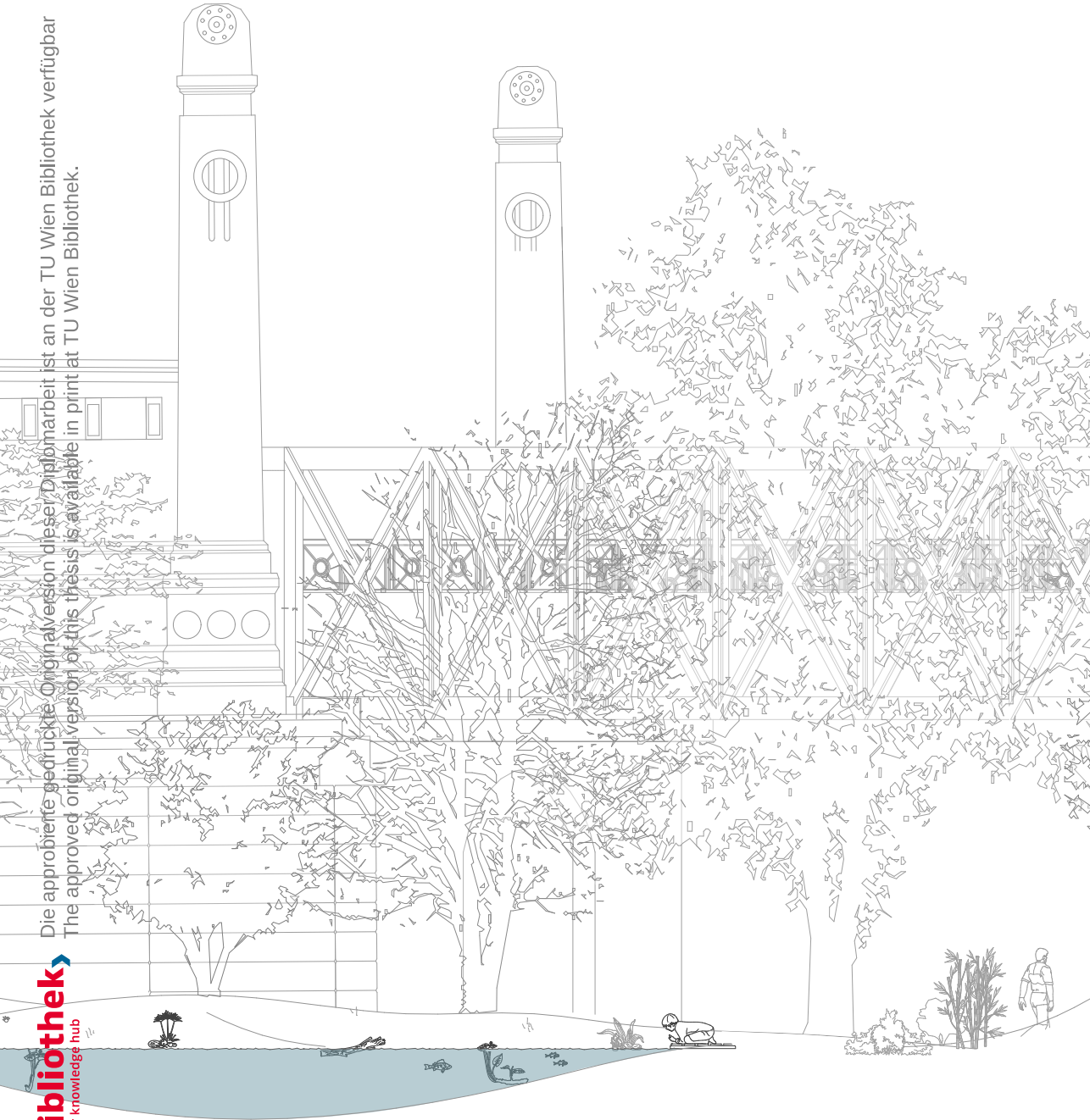
- 1 Showers
- 2 Warm sand
- 3 Garden access/Toilette
- 4 Soak - 42°C



Fig. 99 Individual refuge



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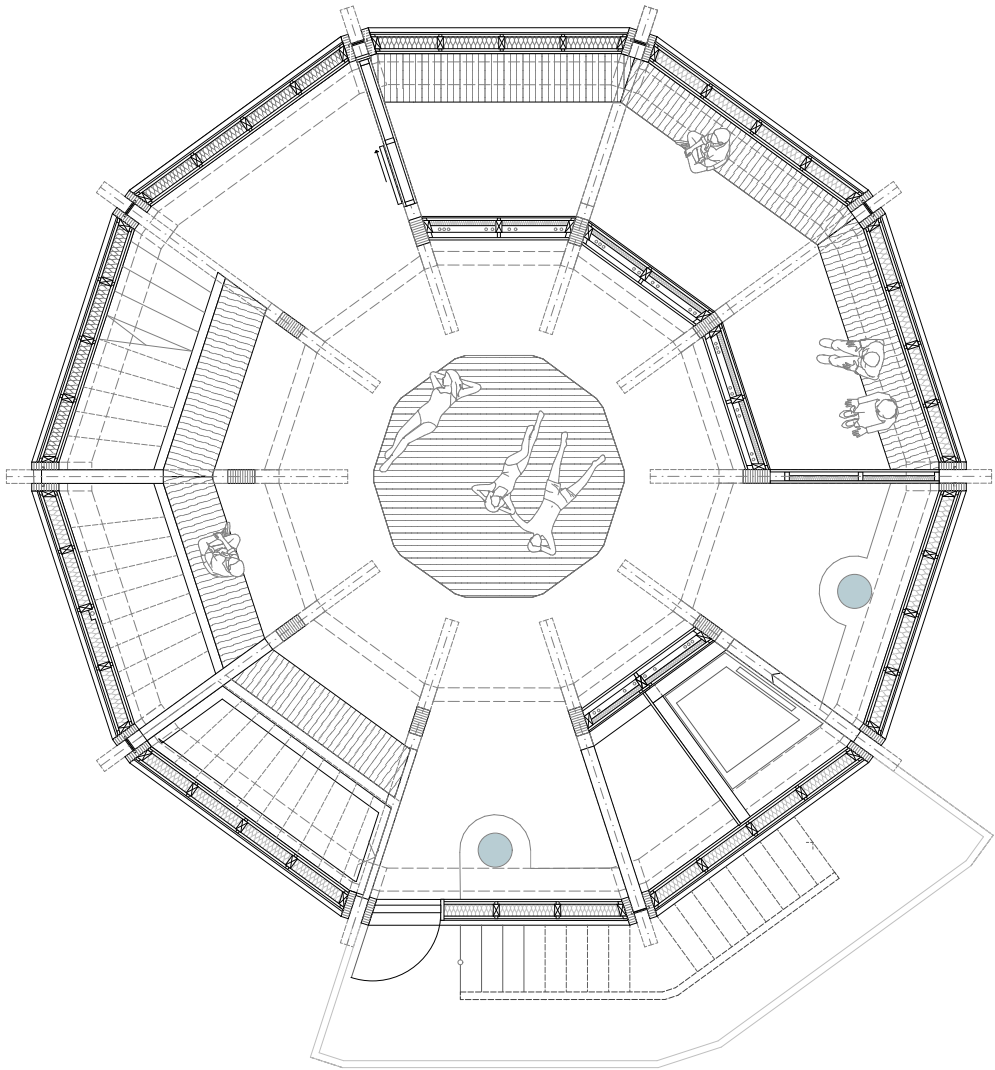




Fig. 100 The Hall's dome



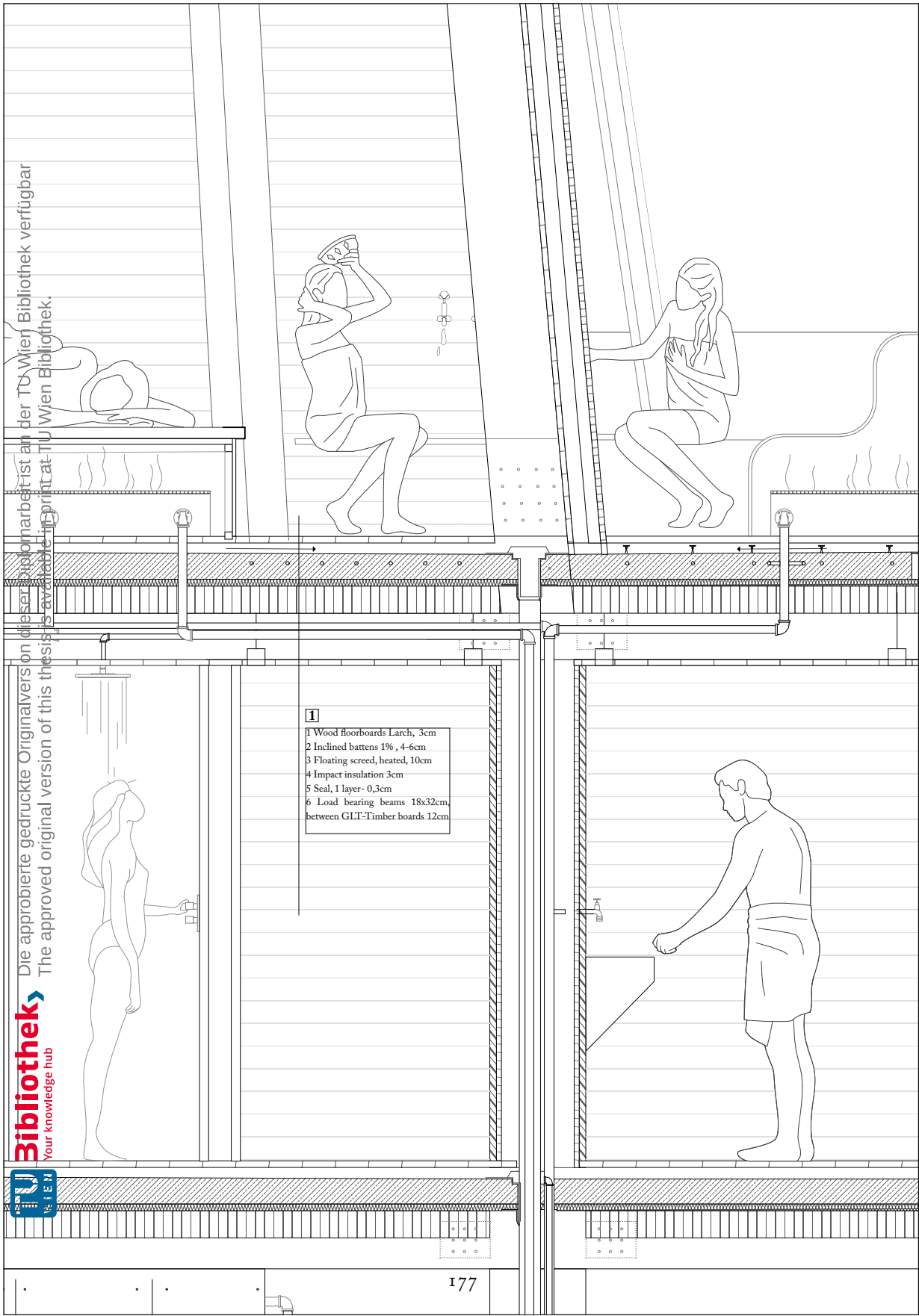
Fig. 102 Construction model

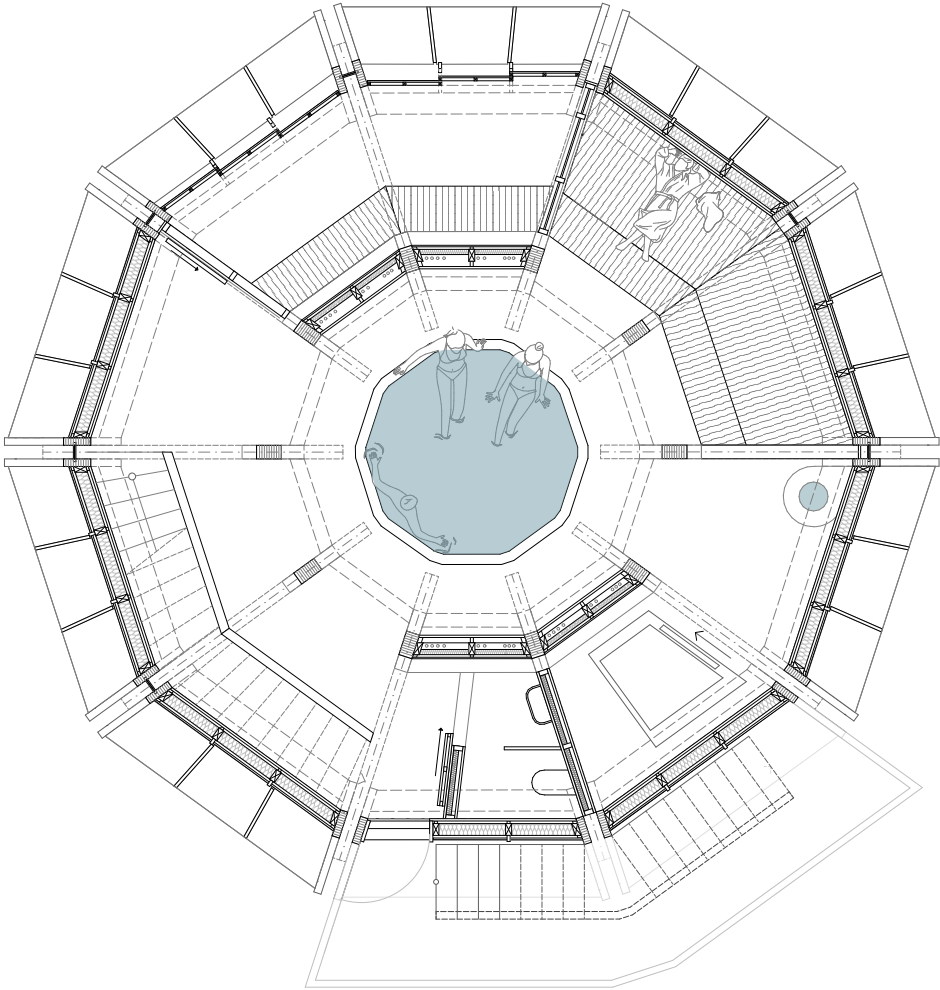


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HAMMAM







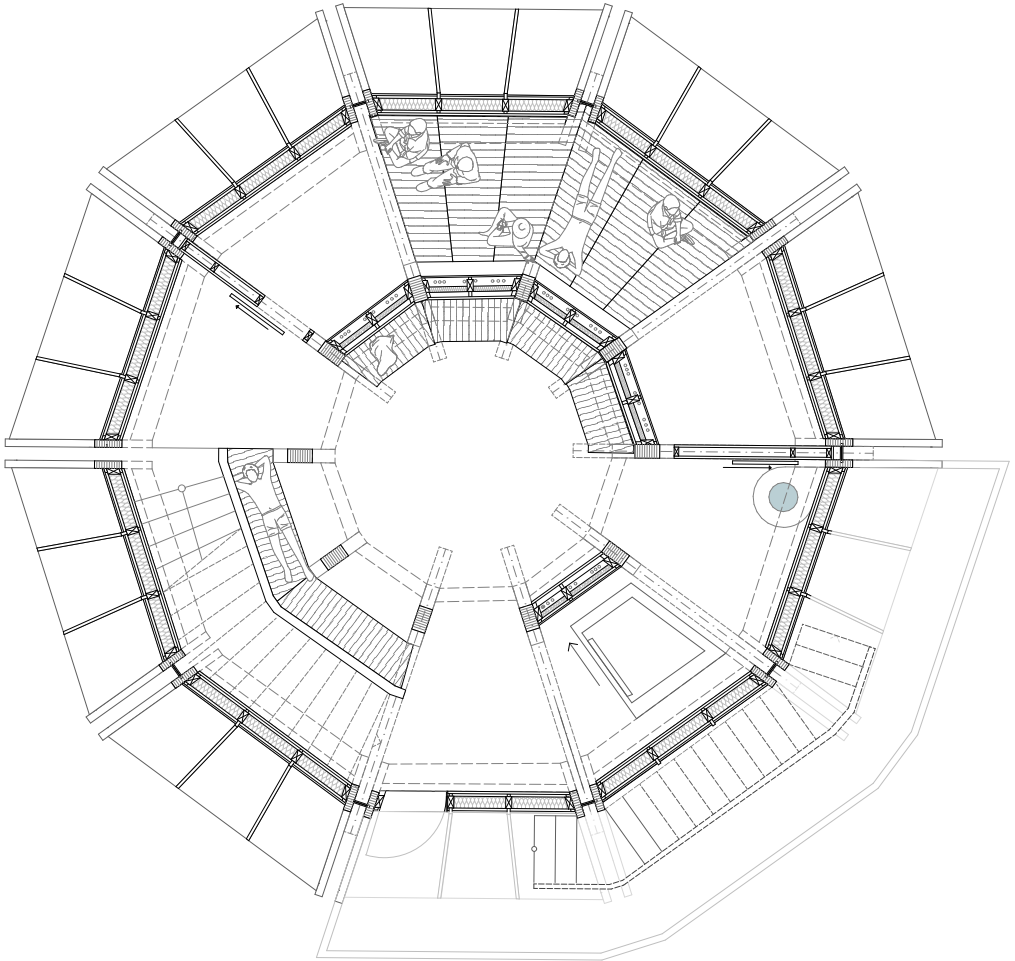
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HAMMAM RELAXING





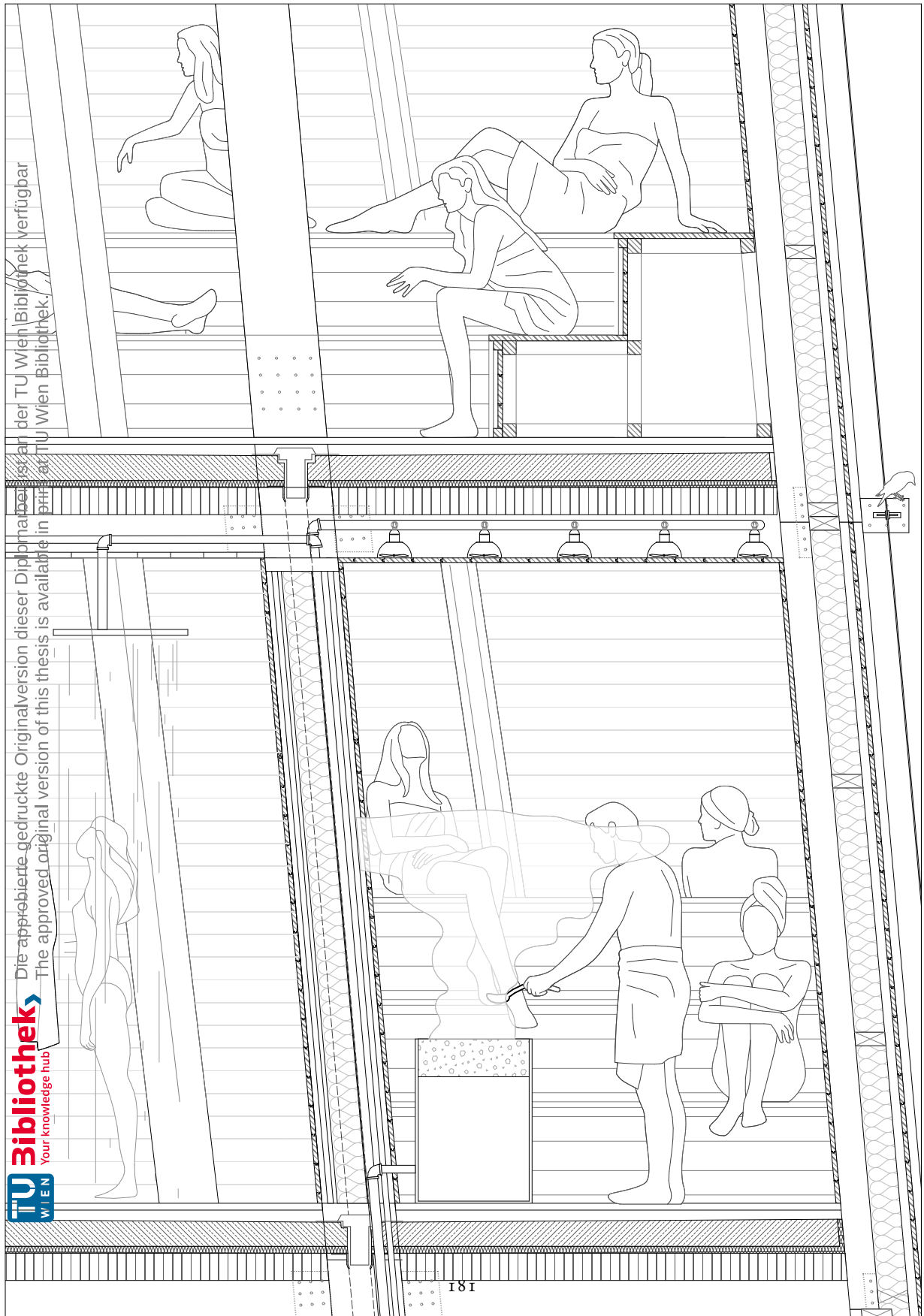
Fig. 101 Towards an outside loggia

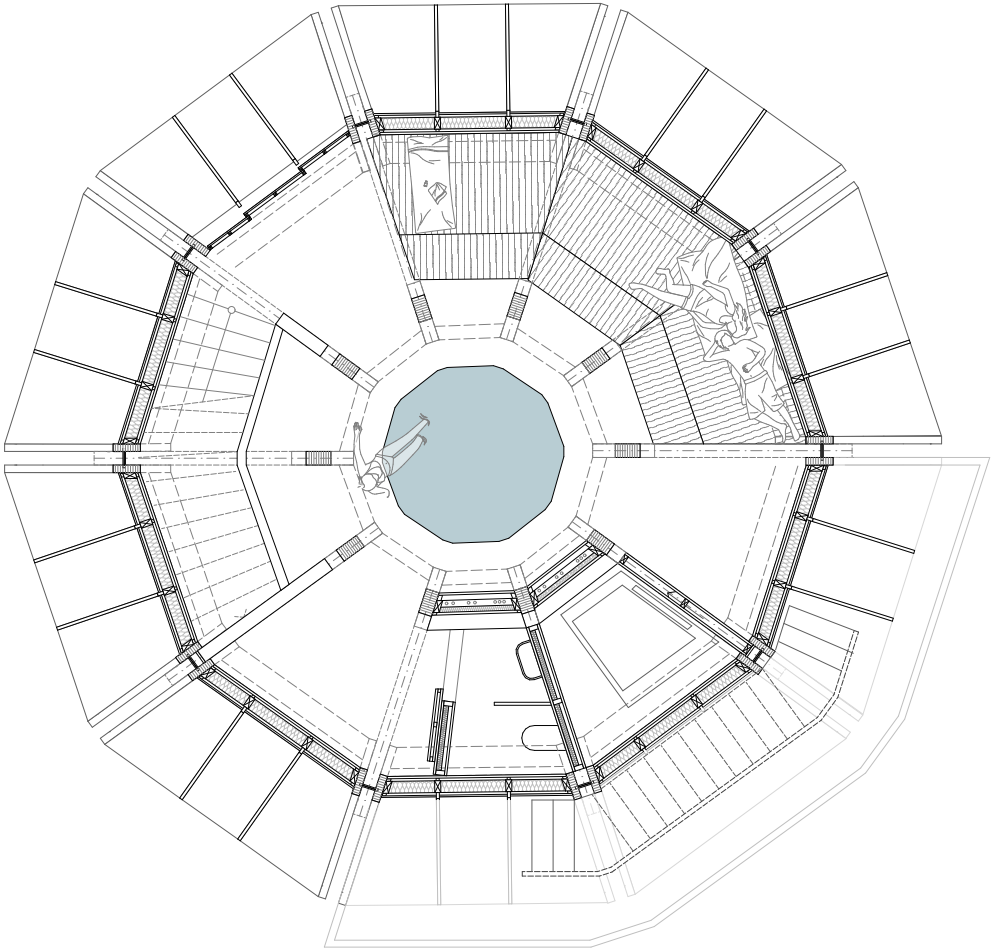


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SAUNA

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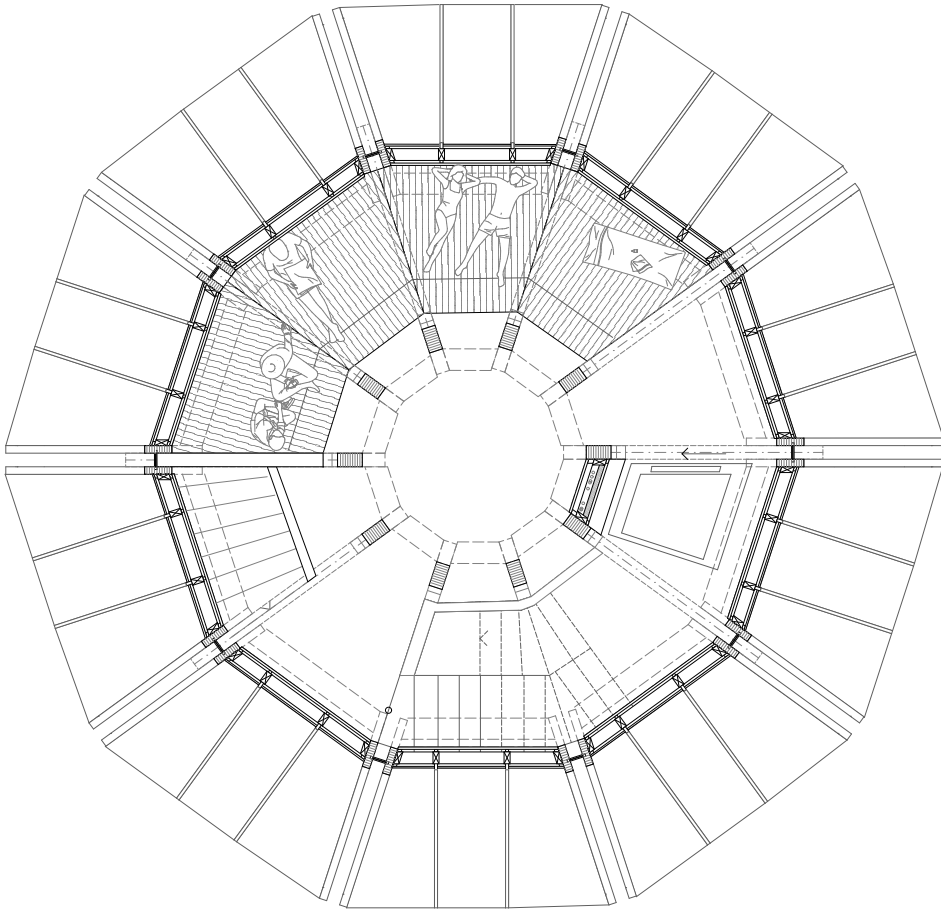




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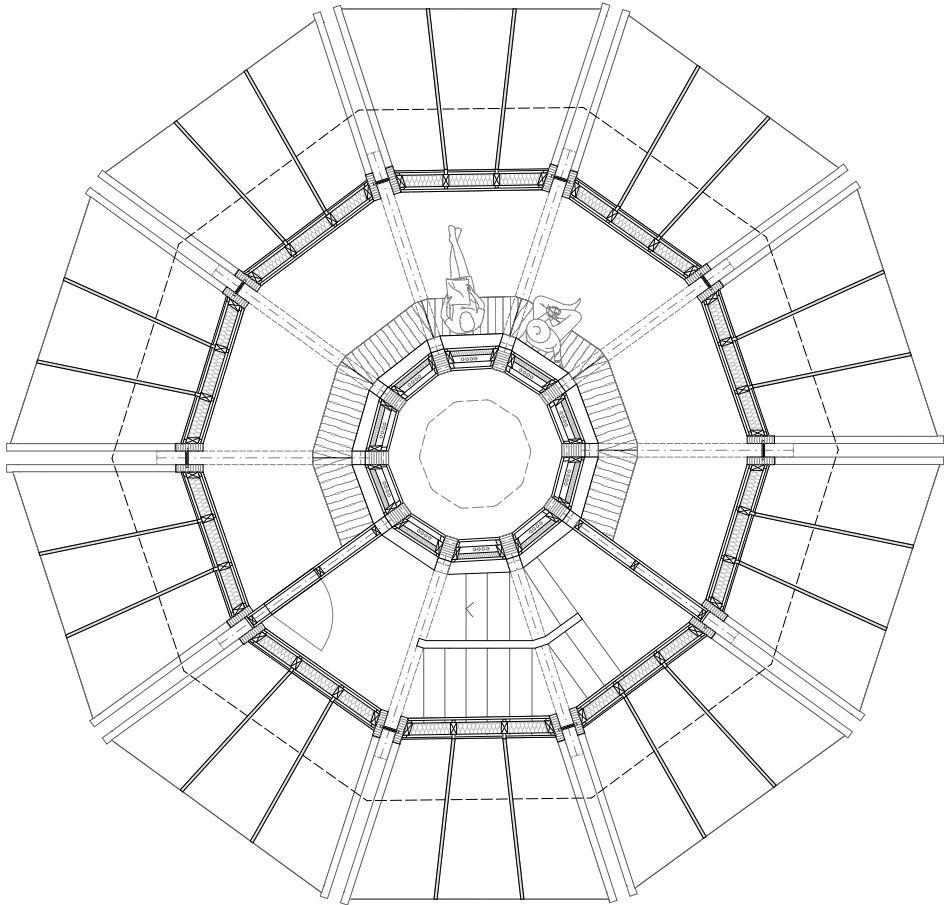




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AULA





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ROOFTOP



Fig. 103 Urban Otium





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List of Figures

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