

**Subterranean Future:
A New Approach to Urban Living**

6.1 - Spaces re-imagined: Research

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Fig. 1 - Yomna Loutfy (2024) - Image depicting the overall theme of the essay - a cityscape showing the extents of what is possible underground

Thesis Question

As urban population density rises, global climate levels worsen, and land scarcity increases, living conditions become more difficult above ground making building underground more likely to happen. New construction of public space takes place every day above ground, but could we envision for this to be shifted underground? It could be said that the underground is not just a place for bunkers, tunnels and trains. What if the future of urbanisation would develop underground? How can we re-conceptualise the underground to benefit the increasing population of the cities?

The scene is set by describing a future that is on the verge of a Third World War, we realise that underground construction can shield us from potential war that may occur. Author Gardner Dane's 1942 essay, "Will war drive civilisation underground?" has described the process of moving underground in the event of war, this essay will start off with a vision and analysis created by Dane on how civilisation can be moved underground:

Building underground can help us plan for the future. In Dane's essay "Will war drive civilisation underground?" he discusses the future of civilisation in the event of a Third World War occurring. Dane starts the article by describing a scenario if World War 3 were to take place, "It's 1975! All hell has burst loose in World War Three! The nations of this earth have lined up again on two sides. The slaughter, devastating fury, and material damage make the wars of past history seem like children's games with toy tin soldiers!" Dane describes World War 3 as a devastating event, the biggest of all wars with massive destruction and bloodshed, with the potential to completely wipe out all traces of civilisation (Dane, 1942).

The first step to moving civilisation underground is to think about the access to food. Dane explains, "Nations will lay by great stores of food! Not food as we commonly think of it today, but millions upon millions of tons of dehydrated meats, fruits and vegetables...these millions of tonnes will be stored underground at strategic accessible points." Food is the fuel needed for humans to survive, if we plan to start building food storage underground, there will eventually be enough food if civilisation moves underground (Dane, 1942).

The second step to moving underground is to think about shelter, and how we can make the underground environment resemble aboveground. "Deep underground, vast chambers will have to be excavated. Families can keep together in cubicles designated for the purpose. Single men will sleep in tiers in bunks 15 or 20 high; single women will sleep in similar accommodations," Dane explains (Dane, 1942).

Dane then goes on to give a clear visual explanation to all the amenities required to move civilisation underground. "All feeding will be done in central kitchens, rigidly controlled as to quality and quantity. Sanitary problems will be handled by specialists. All the accoutrements necessary for living will be moved underground. There will be hospitals and stores. Factories that produce the vitals of war will be underground; there will be factories to produce clothes, medicines and other needs," (Dane, 1942).

Dane has thought about all the necessities required to help civilisation move underground down to the accessibility of electricity; "Fuel will all be electric. We have grown careless in our matter of fact attitude toward fuel. it is vital for heat; it is vital for cooking our food...electricity will be the source of fuel. It is doing things for human beings underground that it is doing and will do above ground in the years ahead," (Dane, 1942).

This article was written in 1942, speculating a potential Third World War in 1975. It is currently the year 2024, a Third World War has thankfully not occurred but seems to be around the corner, yet no one has taken a step to thinking about the future of civilisation and what could happen if war was to occur. Dane was speculating in the article that by the year 1975 most challenges linked to building underground would be resolved. Moving civilisation underground is becoming more likely now than it would have been in 1975, due to the easily accessible and up to date technologies being developed.

It is expected that by the year 2050, about two thirds of the world will live in urban areas. The current population of 8 billion is projected to increase to 9.8 billion by the year 2050 (Roser, 2019). Moreover, the Global climate is expected to rise by 1.5 degree Celsius which will result in more frequent and extreme weather events. As more people will be moving to urban areas in the future, more cities will need to be able to accommodate this change. This essay explores the possibility of moving urban life underground, and whether the future of urban development lies in the subterranean environment. It will do so by looking at the typologies of the underground with a focus on public and leisure spaces (Davis, 2021).

The word underground has negative connotations in different cultures which will be further addressed in this essay. The concept of underground urban development is still undergoing research, therefore there are several drawbacks and problems that require attention when considering underground construction. The essay will focus on the technical, environmental, and psychological aspects of building underground, and how these issues can be addressed.

The underground has historical significance, all the ancient monuments that have been buried over time, and slowly uncovered, are helping us understand the past, shaped our present, as well as anticipate our future. The underground should not be viewed as a dangerous world; instead, this essay will argue, it should be perceived in a more positive light, as a world with potential and opportunity. This essay will cover three case studies to highlight the significance of the underground. Amongst these case studies is The Roman Temple of Mithras in London, which helped us understand how the deity's worshippers lived (Hilts, 2018), and The Curtain Theatre, which may have shaped and influenced the work of the famous playwright William Shakespeare (MOLA, 2016). Moreover, one of the world's most influential figures in psychology, Sigmund Freud, has also taken inspiration from ancient discoveries made underground. His office layout has strong resemblance to the Egyptian King Tutankhamun's tomb, which will be further analysed in this essay (Schroeder, 2020).

In addition, the essay will be looking at case studies that have taken approaches to moving urban development underground. Montreal has taken this approach to protect the people of the city from the harsh weather. Helsinki has cleverly reused and developed existing underground spaces into commercial spaces whilst New York has created a concept to explore the potential of an underground ecology. These projects will be further analysed and explored later in the essay.

Introduction to the meaning of underground

The term underground carries several hidden meanings. While it can just simply refer to tunnels, bunkers, or a form of transportation, the meaning of subterranean spaces extends beyond these conventional uses. “We’ve strenuously attempted to pin down where the underground began, a space somewhere between the material and metaphysical,” (underground England, 2021).

It is believed that people have lived underground for more than a millennium. In the Cappadocia region currently known as Turkey, scientists believed that an underground city called Derinkuyu was home to 20,000 people in the 6th century AD. Additionally, people have lived in caves and holes burrowed into hillsides and rocks for generations (Champ, 2024).

Going back to the 1950’s, the term underground was linked to describe a group of people who gathered to express their opinions against mainstream views and promote their own. Moreover, several resistance movements have started from underground gatherings of people who had a critical modern thinking that disturbed the mainstream of society (Manolache, 2022). In addition to this the term underground has also been used metaphorically; for example, in the case of the underground railroad known in the era of slavery as a network of routes and passages that helped slaves escape from the American South to the North. Although these passages were not underground, the term was used to emphasise secrecy and dark dangerous passages (National Geographic Society, 2023).

Nowadays, the current use of the word underground will not always make a person think of secrecy; everything now is very much out in the open due to social media. In the current decade of “webbed connectivity and media supersaturation,” as the journalist Simon Reynolds (2009) explains “The divide between underground and overground has steadily dissolved”. Social media and search engines on smart phones has made information readily available. (Reynolds, 2009).

In the present day, the term underground is most likely linked with a unique experience, whether it is an underground concert or club or even an underground pub, known as a speak-easy, which ironically means that some people willingly go to a place where they are unsure of what is to come in order to have a one-of-a-kind experience. However, perhaps in these social settings it is known that they have the flexibility to leave whenever they like making being underground more acceptable. (Reynolds, 2009).

Social media has alleviated the dangerous associations of the underground especially for short term activities. However, the idea of moving daily life underground might be viewed differently. The underground is currently known for being used for the purpose of transportation facilities, as bunkers in case of war as well as leisure facilities such as event spaces and art exhibitions.

Typologies of Underground Structures

Nowadays subterranean spaces are used in a variety of ways, in the form of transportation facilities, bunkers, shelters and even leisure spaces. When the word underground is mentioned one of the first thoughts that come to mind is The London Underground transport system, one of the oldest transport systems in the world (Dugdale, 2019). The first Underground Railway station in London opened in 1863 to reduce congestion on the streets (London Transport Museum, 2023).

The London Underground goes several meters below ground level with the deepest station going down to almost 60 meters below the ground. It is safe to say that the underground is the number one form of transport used by London residents as well as tourists that visit the city. Although it is an underground space built several meters below ground level, it is still perceived as a safe and ideal mode of transport used by most city dwellers. In addition to this, several underground stations were previously used as air raid shelters during World War 2 and were reopened and in use as stations today (Attwooll, 2017).

Another term associated with the underground is air raid shelters and bunkers. Bunkers were mainly built to protect people from falling bombs or other attacks during wars, as well as used to store weapons and other valuable items. Some bunkers are today abandoned, employed for storage, or even used to host events such as underground concerts and gigs (News nine Live, 2022).

Moving urbanisation underground can serve as a bunker in itself. For example, if a potential Third World War were to break out, civilisation can be moved underground, and the worry about going back up into a damaged world can be alleviated.

The last typology linked to the association with current underground spaces is public and leisure spaces. The initial idea of underground leisure spaces began when raves were first introduced in the 1980s with people gathering in one place to let loose and enjoy listening to loud music. Ravers used underground and abandoned spaces to dance all night and avoid the restrictions of clubs, which meant that people voluntarily went underground to enjoy certain activities. Furthermore, it could be argued that there is a potential to moving urbanisation underground for specific short-term activities (Chopra, 2023).

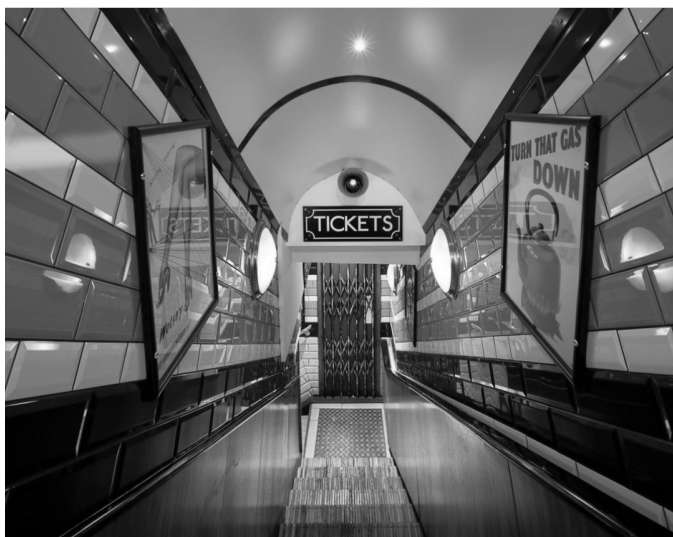


Fig. 2 - Cahoots Pub (2024) Entrance to Cahoots Pub. [Online image].

There are currently several activities that take place underground and one of the most common ones are pubs and clubs. An example of an underground pub is the speak easy pub known as Cahoots, located in the disused Kingly Court Underground station in London. The pub is designed to resemble an underground tube station. People go there to socialise, drink and perhaps escape from reality for a while, in an immersive underground environment. Although it is situated underground it is still visited by many, perhaps the reason for this is because it is a place where you can only spend certain number of hours and it is not seen as a permanent place of living (Saville, 2021).



Fig. 3 - The Vaults
(2024) The Vault s
Tunnels and entrance.
[Online image].

Another underground activity that people voluntarily go to is underground art shows and exhibitions an example of this is The Vaults in London, a 300-meter long Leake street tunnel, located underneath Waterloo station. Founded by Banksy, it is one of London's largest legal graffiti spaces, it is a vast underground arts venue full of bars, theatre spaces and gig spaces (Saville, 2021).

In terms of underground construction, it can be said that these types of activities can be moved and remain underground, as they are seen as trendy spaces for people to go to and spend the day. Perhaps another activity that can be moved underground could be shopping centres such as RESO city in Montreal, Canada which will be further discussed later in the essay. It may be that there is potential to moving urbanisation underground, even for short term activities, however there are still technical and environmental aspects that should be taken into consideration for this to happen.

Technical and environmental issues of underground structures

The cost of building underground is considered significantly larger than building above ground this means that building underground will involve doing exactly what is being done above ground with the additional cost and effort of digging. However, Underground houses tend to have less surface area and so fewer building materials will be required in the construction process as well as maintenance costs will be decreased (Champ, 2024).

Underground structures are wind, fire and earthquake resistant which will allow for a safe environment during extreme weather conditions. Another benefit to building underground is energy efficiency due to the earth's subsurface temperature remaining stable, this allows underground structures to benefit from "geothermal mass and heat exchange, staying cool in the summer and warm in the winter. This saves around 80% in energy costs." Although building underground can be costly at first due to excavation and waterproofing, however, in the long run it can have a positive impact in terms of energy efficiency and weather control (Chris, 2024). Another issue with building underground would be the access to natural light.

John Carmody and Raymond Sterling state "Natural light is important to users of a building even if the proportion of daylight to artificial lighting for work tasks is relatively low." A windowless environment is one of the most common negative characteristics mentioned that differentiates between an aboveground and underground environment (Carmody & Sterling, 1987). Underground spaces can be designed to maximise the amount of natural light by strategically placing windows and skylight to capture sunlight throughout the day, as well as having open floor plans to enhance the sense of space and light. Lastly, having reflective surfaces and colours will allow for the distribution of light more effectively through the space (Chris, 2024).

A conceptual underground project known as the Lowline in New York City has developed a new technology that allow for the capturing of natural light allowing it to enter the underground environment and provide an atmosphere that is close to being aboveground. This project will be further discussed later in the essay (Endicott, et al., 2020).

When thinking about underground construction one of the other issues that comes to mind is air quality. If underground construction is carried out as a windowless environment, there will be a lack of natural ventilation. Good ventilation is needed to prevent the build-up of indoor air pollutants and to remove excess heat from occupied spaces. One major pollutant that causes concern, which is found in the underground environment and released by soil and rock such as building construction materials and concrete, is Radon. This means that careful planning is required to make sure the underground spaces are well ventilated (Carmody & Sterling, 1987).

In order to improve the air quality in underground spaces advanced ventilation systems should be used to maintain underground air quality. Moreover, extensive waterproofing and drainage plans are required to manage waterflow and prevent moisture build-up, along with the use of non-corrosive materials in areas that are prone to dampness (Carmody & Sterling, 1987).

The last issue that requires attention when it comes to underground construction is temperature control. Carmody and Sterling State “Unless controlled, summertime humidity levels will be higher in underground structures than in aboveground structures.” If the temperature is not properly controlled in underground environments, it can result in humid conditions which can have a negative impact on the occupant, resulting in the development of mould and leading to an allergic reaction or further health problems (Carmody & Sterling, 1987).

If urban life will be moved underground, careful planning needs to take place to create a well-ventilated space with a comfortable temperature and humidity levels. Creating a well-ventilated space should not be more difficult underground than it would be in a conventional building above ground. Depending on the occupancy patterns underground, as well as, the activity taking place different systems of ventilating will be required to help control the temperature. (Carmody & Sterling, 1987).

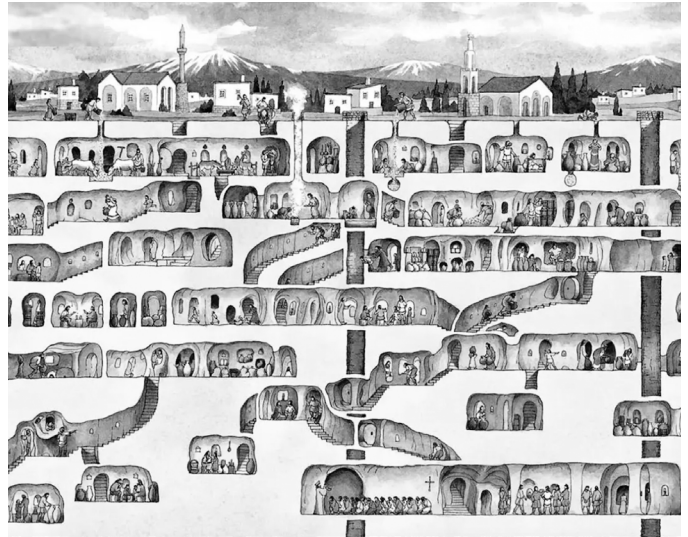


Fig. 4 - Yesir (2023)
Sectional illustration of
Derinkuyu.
[Online image].

An example of an underground city that has good environmental solutions for the issues to living underground is Derinkuyu the underground city in Turkey. This city was 18 storeys and 280 feet deep and could house around 20,000 people. It was shut off from the world above and ventilated by more than 15,000 shafts about 10 cm wide reaching down into the first and second levels of the city, which ensured sufficient ventilation all the way to the 8th floor. The upper levels were used as sleeping quarters as they had the best ventilation and the lower levels were used for storage. In between were rooms for wine press, domestic animals and even small churches. The city also served as a temperature refuge to help avoid the city's extreme weather conditions (Jacobs, 2022).

It could be argued that because this city is so old people lived a much simpler life, which meant that their requirements to live are less demanding than the needs of today's society. However, some of the elements that this city has implemented can be used to help with modern underground construction. For example, providing ventilation shafts that only extend to areas where they are most required or by dividing the space efficiently to strategically build living spaces and storage spaces at different depths.

The people of Derinkuyu successfully created a life underground, however, as it was an old city perhaps being underground had psychological effects that were not stressed enough. The psychological issues associated with being in a subterranean environment need to be addressed in order for civilisation to move underground.

Psychological Issues of Underground Structures

The underground holds several negative associations that link to the idea of danger, being trapped and unable to get out or even death. It is perceived as an isolated space separate from the built environment aboveground. The view towards the subterranean environment varies depending on the experience of each individual or society. For example, a person who is used to working underground will likely have a different perspective towards the subterranean environment than a person who mainly works aboveground (Lee, et al., 2017).

In several cultural and religious beliefs the underground has negative associations; for example, in the case of Christianity the underground is perceived as hell, while in Buddhism and Taoism it relates to the realm of the dead. In addition to this, in many societies burial takes place underground; consequently, the idea of being underground is strongly linked to being buried. Moreover, in modern societies it is perceived that people who live in underground spaces such as basements are those who are impoverished causing the underground community to be mostly viewed with a negative or unprivileged cultural identity. In addition to negative associations with the underground the feeling of isolation is also a common psychological issue of the subterranean environment (Lee, et al., 2017).

The feeling of isolation and claustrophobia is the second most common psychological issue that affects people in association with the subterranean environment. As the author Gerhard Auer outlines in his essay titled "Daidalos", "In the altered acoustics of the underground, as extra-corporal sounds become deadened by the volume of the earth, recognition of the interior of the body becomes stronger. The pumping of blood, the passage of air through the lungs become audible, the body listens to its own sounds." Auer describes being underground as a space where a person becomes isolated from the outside world with no access to sound, a space so quiet that a person starts to become aware of their own body (Auer, 1993).

Being underground creates a barrier between aboveground and below ground, evoking an idea of loneliness and separation from everything. Providing architectural solutions to blur the barrier between underground and above ground could help people acclimatise to the subterranean environment more easily. The main issue with isolation is a feeling that you are stuck and unable to get out. Architectural installations such as linking escalators from above ground to below ground or considering a smoother way to transition can help reduce the separation between both spaces (Lee, et al., 2017).

Additionally, developing an intermediary could reduce the transition. For example, low-sloped passageways connecting the underground and the aboveground space could remove the floor difference allowing for a more seamless and less obvious change. Moreover, these passageways can be used as utilitarian spaces to avoid them being isolated and dark, as well as, they can be constructed to mimic streets aboveground by adding signage to highlight exit routes, this can promote a sense of familiarity and reduce the feeling of isolation (Lee, et al., 2017).

The last psychological issue linked to the underground environment is the lack of safety and security. The underground world is dark, and being unable to see what is ahead or what is around a corner creates a sense of danger and lack of security. Wayfinding underground is considered difficult and creates a lack of perceived control, author Eun H. Lee explains, “perceived control is a critical construct in psychology which can influence both physical and mental health,” (Lee, et al., 2017). Perceived control is part of the locus of control, and it is the extent to which you feel in control of the events that influence your life. The internal locus of control is control that comes from yourself over your life and external locus of control are events you could not control that have affected your life (Thompson & Schlehofer, 2020).

Being underground makes an individual feel like they have a lack of control and that things may be imposed onto them rather than them imposing them. For an individual to feel in control it could be as small as being able to open a window, a door or even leave a room when they want to and being underground in a dark windowless environment could create a lack of perceived control. In addition to lack of windows, being underground creates an idea of being lost due to lack of landmarks which makes navigation and wayfinding difficult (Lee, et al., 2017).

Additionally, a person might not feel safe in an underground environment, it could make them feel like they are not meant to be there. The underground could sometimes be perceived as a private space whereas aboveground can be perceived as open and public. A public space is intended for the use by everyone, without restriction, with the principle of free access for all. Examples of public spaces include squares, pavements and pedestrian areas. The reason the underground is seen as private is because it is known to be only accessible by specific people or for the purpose of storage. To enter an underground space payment is sometimes required to get in which is another reason as to why it could be viewed as private (Labbé, 2016).

On the other hand, the London underground is a public space accessible by all, but it is not free of charge. It could be argued that even the London Underground one of the most used public transport methods in London could be seen as a private space, yet most people do not think twice about entering. It could be said that all public spaces are seen as commercialised public spaces with no space being truly public or private, meaning that both underground and aboveground spaces could be considered private. (Alonzi, 2022).

To tackle the issue of safety and security in underground spaces, careful design decisions need to be made. For example, creating a connection to the aboveground through light tunnels to help improve visibility or added surveillance can add a sense of security underground (Lee, et al., 2017).

To try and alleviate some of the psychological issues discussed above and to make the subterranean environment feel more like a conventional building aboveground, the design interventions discussed below can be a good starting point.

1. High ceilings:

Higher ceilings than normal in an underground space will reduce the feeling of claustrophobia (Carmody & Sterling, 1987).

2. Multi-level spaces:

Whenever possible large atriums that connect the underground with the area above to maintain a connection and provide a sense of orientation within the space could help reduce the feeling of isolation. (Carmody & Sterling, 1987).

3. Entrance:

Rather than providing a space that is enclosed, dark and unrecognisable, perhaps it is better to think about the transition between the aboveground and underground and to try and make it a seamless change by providing large clear entrances. Additionally, properly lit entrances with an inviting feel can encourage a person to enter a space (Carmody & Sterling, 1987).

The environmental and psychological aspects of the underground cannot be overlooked and require careful consideration when it comes to underground construction. However, the underground has more to offer than just be viewed as an isolated, inaccessible private space with a lack of safety and security. The underground has more value and significance than meets the eye, all the historical discoveries being uncovered from the underground should force us to reconsider how the underground is perceived.

Significance of the Underground

The ancient monuments and underground discoveries hold great significance that aid in the understanding of our history as well as anticipating our future. As author Christian Tryon explains “Archaeology is the reconstruction of ancient behaviour from the things people left behind.” Underground construction can help us uncover layers of the past; consequently living in underground spaces can bring us closer to our origins. Understanding the past and its significance as well as, looking at how people used to live can help us inhabit underground spaces and preserve them rather than destroy them. (Tryon, et al., 2010).

To allow us to understand the significance of the underground, three case studies will be explored in this section starting with The Temple of Mithras in London and how the discovery has allowed us to understand the way people who followed the Mithraic religion built their temples. The second case study that will be discussed will be the Curtain Theatre and how the discovery has allowed us to understand who used to visit the theatre and how their time was spent there. Finally the last study that will be explored will be about Sigmund Freud and the influences that the archaeological world had on his practice.



Fig. 5 - The Times
(1954) London Temple
of Mithras Excavation.
[Online image].

Mithraic temples were semi underground structures built for the purpose of religious gathering. The London Temple of Mithras was one of London's greatest archaeological discoveries, built by the Romans in 240AD (Hilts, 2018). It was discovered in 1954, dismantled and reconstructed about 100 meters from its original location in 1962. The temples were small, gloomy and meant to evoke the cave where the God Mithras killed a bull (Merkelbach, 2023). The Temple of Mithras is the only Temple in London that was discovered with a complete plan (Hilts, 2018). As the temple was partially underground, it was not massive in size, it only fit about a hundred people at a time. All ceremonies were carried out under artificial lighting and access to the temple was through a system of several subterranean passages, which were used in initiation ceremonies (Merkelbach, 2023).

The discovery of this temple has helped us understand how the people who followed this religion lived and worshipped. They used the underground to create spaces that were sacred and private. Moreover, this discovery has helped us recognise that some religious groups purposely built underground structures for worshipping.

In addition to this the excitement brought when a historic monument has been uncovered is unmatched, these discoveries can be preserved for future generations down the line. As Oral Historian Clare Coyne states, "A recurrent theme is that seeing a Roman temple rise from the streets of London made history real, palpable and exciting and something to be experienced again and again and shared with further generations," (Coyne, 2014).

Whilst The Temple of Mithras was a semi-underground space for the purpose of religious gatherings, the following case study is the Curtain Theatre which was a space of gathering for leisure. This information was established through the observations made during the excavation process.



Fig. 6 - MOLA (2012)
Curtain Theatre
Excavation in London
[Online image].

An equally significant discovery is The Curtain Theatre discovered in Shoreditch, London in 2012. Some might say it is one of the best-preserved examples of an Elizabethan Theatre in the UK (MOLA, 2016). The curtain Theatre was the main venue for Shakespeare's plays between 1597 and 1599, it is believed that *Romeo and Juliet* and *Henry V* were first performed there (Kennedy, 2012).

During the excavation there were little clues that were found to help us understand the type of people that went to theatres, how much it cost to enter, down to what they ate and drank. Maev Kennedy explains "We should learn the size of the yard – and therefore how many groundlings could be packed in for a penny a head – and possibly, from the size of the foundations, how tall the galleries rose. We'll know what the spectators ate, from dropped oyster shells and hazelnuts; what they wore, from dress hooks and little metal tips of laces; what they drank, from broken ale mugs and wine cups and even where they peed when they'd drunk too much," (Kennedy, 2012).

Although the curtain theatre was above ground and got buried overtime, it could be argued that this discovery links to the way we might view the underground. Discovering such an important space may as well have affected how modern theatre is viewed today and highlights how significant the underground is. There are still underground discoveries that are taking place to this day, by uncovering these spaces and truly understanding how people used to live in the past it could change our approach towards the subterranean environment and encourage moving civilisation underground.

The underground discoveries have not just been about uncovering spaces and understanding the past, but they have influenced theories and practitioners within their field. Neurologist, Sigmund Freud, was influenced by the process archaeology and used the term metaphorically to develop his theory of Psychoanalysis.

Sigmund Freud and Underground Influences



Fig. 7 - Edmund Engelman (2020) Freud's Psychoanalytic Couch [Online image].

Sigmund Freud (1856-1939) was an Austrian Neurologist and the founder of psychoanalysis (Jay, 2024). Psychoanalysis is a theory of how the brain works and it was used to help people with mental distress. The goal of psychoanalysis is to bring repressed thoughts and feelings to the surface; when a patient acknowledges and understands these repressed feelings, they would be cured of their mental illness. A method that Freud uses with patients is called free association where the patient is told to talk freely about ideas and memories with no judgement or thought which then allows these repressed thoughts to come up to the conscious level. The goal was to make the unconscious become conscious, Freud believed that anxiety and depression can be cured with this theory. The unconscious mind: part of the mind that is inaccessible to the conscious mind was key behind Freud's beliefs. He believed that thoughts were repressed but not erased and that the unconscious mind impacts every action we do. Freud developed an archaeological metaphor that linked with the idea of uncovering a patient's thoughts (Clinical Psychology Part 1: Sigmund Freud and Psychoanalysis, 2023).

Freud was invested in archaeology and the idea of uncovering the past, Julia Schroeder explains, “the archaeologist and the psychoanalyst were united by their shared mission to discover and preserve the past”. He thought of the mind as layers, just like in archaeological digs (Schroeder, 2020).

“The archaeologist builds up the walls of the building from the foundations that have remained standing, determines the number and position of the columns from depressions in the floor and reconstructs the mural decorations and paintings from the remains found in the debris, so does the analyst proceed when he draws his inferences from the fragments of memories, from the associations and from the behaviour of the subject of the analysis,” (Freud, 1964).

Freud argues in the text – the Aetiology of Hysteria – “Imagine an explorer arrives in a little-known region where his interest is aroused by an expanse of ruins, with remains of walls, fragments of columns, and tablets with half-effaced and unreadable inscriptions. He may content himself with inspecting what lies exposed to view, with questioning the inhabitants... about what tradition tells them of the history and meaning of these archaeological remains... he may have brought picks and shovels and spades with him, and he may set the inhabitants to work with these implements. Together with them he may start upon the ruins, clear away the rubbish, and, beginning from the visible remains, uncover what is buried,” (Freud, 1896). This explains that the archaeologist may uncover enough remains, tablets and inscriptions to produce rare information about the events of the past to remember the monuments that were built. This shows that the past can leave small traces of evidence and that upon excavation these traces can be reconstructed to allow us to understand what has happened in that space and how people used to live. (Griselda Pollock - Time, Space and the Archive: The Archaeological Metaphor in Freud , 2002).

Freud made a note during his session with his patient - The Rat Man - "I then made some short observations upon the psychological differences between the conscious and the unconscious and upon the fact that everything conscious was subject to a process of wearing away. While the unconscious was relatively unchangeable and I illustrated my remarks by pointing to the antiques standing about in my room they were in fact only objects found in a tomb and their burial had in fact been their preservation," (Freud, 1909).

Freud explains that the burial of these artefacts in the tombs is the same as the childhood memories and feelings that are repressed and preserved by the mechanism of the unconscious. The metaphor Freud has made in relation to archaeology and psychoanalysis is that the cure to mental illness is by accessing the unconscious thoughts hidden beneath the surface and bringing them to light will therefore destroy them. Additionally, if we look at this analysis in terms of archaeology it could be said that digging up these artefacts and understanding their significance might allow us to make sense of the unknown past.

Furthermore, Freud has made remarks on the objects in his office by describing them as "only objects found in a tomb" perhaps saying this gives them less significance to ease the patient into uncovering their repressed thoughts. Everything around Freud's office had significance and helped him in his practice, starting from the small antiquities that were placed around his office to the layout and orientation of the space. (Griselda Pollock - Time, Space and the Archive: The Archaeological Metaphor in Freud , 2002).



Fig. 8 - Rasid Necati Aslim (2022) Freud's Office [Online image].

Freud's office was designed with inspiration from the Egyptian king Tutankhamun's Tomb. Freud's comparisons between psychoanalysis and archaeology formed the basis of his archaeological metaphor. This metaphor reveals how his tomb-like office helped in liberating the patient's mind (Schroeder, 2020). A question that is brought up is why would there be so much art in a space of medical science. "Not Picasso but Egypt, Greece, Rome and China – this spoke to and of Freud's desire, and his childhood dreams" Griselda Pollock explains (Griselda Pollock - *Time, Space and the Archive: The Archaeological Metaphor in Freud*, 2002). The layout of the rooms invites a reading into Freud's mind.

Julia Schroeder explains, "In the tomb, the mummy's body rested in the sarcophagus as its spirit journeyed into the afterlife. In the office, the patient rested on Freud's couch and journeyed into the realm of the unconscious." (Schroeder, 2020). Most of the antiquities within Freud's office were made up of an extensive collection of objects found in tombs, mainly Egyptian tombs, it is believed that Freud has picked these antiquities carefully to ensure that they help him within his practice (Schroeder, 2020).

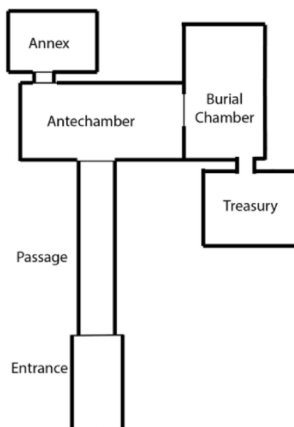


Fig. 9 - Julia K. Shchroeder (2020) Comparison between the floor plan of Freud's office and the floor plan of King Tutankhamun's tomb. [Online image].

It is evident that Freud did not only house his office with antiquities, but he looked at the layout of the underground burial chamber of King Tutankhamun. The layout of the internal tomb elements initiated the mummy's rebirth and transition into the afterlife. When Freud's patients access the unconscious, it is like they are going through a process of revival. Freud had no direct links to archaeology or architecture, however the ancient discoveries that have been made overtime have inspired and informed his theories. He used the works of the archaeologists of uncovering the underground and what lies beneath the surface as metaphors to inform his work (Schroeder, 2020).

Therefore, underground ancient discoveries just like they informed Freud's theories they can help us change the way we approach the future of living. These discoveries highlight the significance of the underground and shows us that it has more to offer than just being a secluded isolated space. Through inhabiting the underground, we could be celebrating its significance.

Potential of the underground: Case Studies

With all the negative associations and challenges that have been discussed in this essay in relation to the subterranean environment, it is safe to say that there are also positive aspects to underground construction. There are currently several existing underground spaces that have been constructed and are a huge success. The concept of underground spaces, specifically commercial spaces, is becoming more in demand and more cities are starting to utilise the underground to cater for the growing urban population. Almost all cities are expanding the underground through the existing transportation systems by transforming stations and passageways into more commercial based spaces, with the addition of shops, cafés and restaurants. Cities like Montreal, Helsinki and New York have managed to successfully utilise the underground to create new larger spaces that might not be suitable to build aboveground or might have occupied a lot of space over ground.



Fig. 10 - Steve Minor (2018) RESO underground Complex [Online image].

RESO is an underground city located in Montreal, Canada. It was initially built to protect residents from Montreal's harsh weather conditions, along with the aim of growing the city's downtown. The development of the city began in 1962, designed by Canadian Urban Planner Vincent Ponte. RESO is a network of passageways linking various commercial and office buildings, spanning over 35km beneath the streets of Montreal. RESO is a complex of shops, restaurants, malls, subway stations, office buildings, theatres, concert halls, art galleries, museums and conference centres. Mark Pimlott describes the underground complex as, "An experience of walking across a landscape uninterrupted by crossings". The layout of RESO worked in conjunction with the urban layout above ground, at important crossings over ground there was signage displayed in the promenades guiding people with connections and exits. Moreover, RESO has four courtyards set into the squares aboveground that allow for daylight to enter the promenades (Pimlott, 2020).

The complex has gone through a several large-scale infrastructural projects since the completion of the first phase in 1966. RESO currently connects several parts of the city through the promenades and passageways providing access to most underground metro systems around Montreal. (Pimlott, 2020).



Fig. 11 - Eric Herman (2019) Itäkeskus underground swimming pool [Online image].

Another example of a city that has successfully made use of the underground is Helsinki, Finland. Helsinki has surpassed the typical uses of the underground, by cleverly adapting and reusing the existing subterranean environment, to create well designed multi-functional underground spaces. Ilkka Vahaaho states “Helsinki is a city that uses its multi-layered underground in a highly effective way”. The city’s underground environment has aided in the construction of underground spaces. The bedrock mainly consists of old Precambrian rocks, which are considered ideal for tunnelling and underground building. The use of cast concrete lining will not be necessary which will result in lower-than-average building costs. (Vahaaho, 2020).

The main reason Finland started underground construction is due to the city's structure becoming denser, which means more facilities for different purposes are being moved underground. Although Finland is not prone to earth tremors, underground construction is a solution to reduce their effects even more (Vahaaho, 2020). Finland began constructing a network of underground facilities in the 1980's. Currently, Helsinki has around 400 separate underground facilities and tunnels, with the deepest at 100m below sea level. Around 90 of these spaces have been built for dual purposes, e.g. it can take 72 hours to turn a sporting field into a shelter, with installed decontamination showers and toilets with a tightly sealed door.

An iconic project in Helsinki that has demonstrated the idea of reusing and adapting existing underground spaces is an underground swimming pool in Itakeskus by Arkkitehtitoimisto HKP built in 1993. The space has pools, gyms and a fitness centre spanning over two floors with capacity to accommodate around 1000 visitors at a time. If needed, the space can be converted into an emergency shelter for 3800 people. Through the careful planning and redesigning of Helsinki's subterranean environment the city's residents currently view the underground as an experience and not just as a threshold between spaces. Vahaaho states, "For the inhabitants of Helsinki, these are not simply places of transit, to be hurried through, but places for eating, drinking, sports, dancing, visiting the theatre, target shooting and kart racing" (Vahaaho, 2020).



Fig. 12 - Raad studio
(2012) The Lowline,
New York City
[Online image].

The final case study that demonstrates the potential of the underground is The Lowline in New York City, USA. The Lowline is a conceptual project proposal for the world's first subterranean park advocating for underground ecology, an all-year-round green space. The Lowline seeks to re-purpose a run-down area of New York City's transit systems known as the Williamsburg Bridge trolley terminal which has been abandoned since 1948. The highway above the terminal is currently one of New York's most densely populated areas with the least amount of greenery, this created a challenge for the Lowline co-founders Dan Barasch and James Ramsey to envision a different approach to provide city dwellers with a green space (Endicott, et al., 2020).

The first challenge to creating an underground park is the technology needed to channel sunlight into the underground. John Endicott explains, "A system of remote skylights and fibre optic cables will capture sunlight from nearby rooftops and channel it onto the reflective surface of a distributor dish that diffuse the natural light around the space". This technology allows for extensive amount of light to enter the underground space to allow for the natural growth of plants and vegetation (Endicott, et al., 2020).

A prototype for the Lowline was built in 2012 in a small dark warehouse with a similar atmosphere to the proposed site to test and experiment the daylight technology. The aim of this prototype was to try and alleviate the fears often associated with the underground, such as confinement, ventilation and encounters with rodents. Unfortunately, The Lowline has not yet been constructed and has stopped at the conceptual phase. However, it is a good example that explores a different approach to building underground (Endicott, et al., 2020).

These case studies cleverly show the different ways the subterranean environment can be used whilst proving that building underground is no different to building above ground. Most challenges discussed earlier in the essay have been addressed in these projects, e.g. courtyards and modern lighting technologies have been used to try and create a more inviting space. Furthermore, new and innovative methods to reduce the transition and threshold between the subsurface and aboveground spaces are still being developed. Additionally, the journey to moving life underground is far from resolved, however, it is a process that is well underway and holds great potential to the future of urbanisation.

Conclusion

If we go back to the question - "What if the future of urbanisation would develop underground?" This would need rephrasing. The perception of underground spaces has changed, from being viewed as a secluded space for storage, sheltering and transportation; over time, the underground has been re-purposed for a range of leisure activities, such as clubs, art exhibitions and pubs. The underground is now thus viewed as an opportunity for the creation of unique environments where people go to try new things and have different experiences. This leads to think that the use of the underground is only viable for short-term activities and not long-term living.

If we want to consider moving urban living underground, there are challenges we need to face. One of these challenges would be thinking about the technical and environmental issues with underground construction such as: cost, light, air quality and temperature control. These problems require a lot of research and testing to create the right environment for permanent living. However, the overarching challenge and one that is even more difficult than the technical issues is the psychological effects and negative associations of the underground; consequently the challenge is for people to accept the idea of moving and living underground.

Author Gardner Dane describes the process of how civilisation can slowly be moved underground through the psychological law of readiness, "Unchangeable laws of psychology is the law of readiness. When our nervous systems have been conditioned by countless generations to respond to a certain stimulus a given way... the human beings on this planet cannot be changed in any one generation of time," (Dane, 1942). Dane explains that civilisation will not accept living underground overnight, it is a slow process that requires careful planning and consideration and there is a high possibility that humanity might not accept this concept at all.

It is possible that to ease the transition underground we need to highlight the significance of the subterranean environment and to look at all the underground discoveries that have shaped our world as we know it today. For example, if we look at the Ancient Egyptian discoveries, we realise that they have influenced one of the most important figures in the world of psychology, Sigmund Freud, and we recognise that the underground has a lot more to offer.

The case studies discussed show that countries like Canada, Finland and the USA are just a few examples that have already moved several amenities underground. RESO city in Canada has been proven to be a great success by providing protection for the harsh Canadian weather as well as a new downtown for the city without taking up space aboveground. Helsinki has cleverly reused and re-purposed the existing underground rock layers to house several forms of activities such as sports centres as well as commercial spaces. These countries have started the construction of underground spaces several years ago and today, RESO city is a big tourist attraction in Montreal and the idea of underground construction in Helsinki is now very common. Whilst New York City has not constructed the Lowline, the prototype that was built has received a lot of support and praise to provide an all-year-round green space in an overly populated urban environment.

This essay has explored the potential of the underground with the consideration of several negative aspects as well as looking at how we can change our view towards subterranean environments. Moreover, it is evident that the main reason the case studies discussed were a success was due to the fact that they were still connected to the aboveground environment and were not considered to be completely isolated underground spaces.

In summary we can ask, “what activities can be moved underground?” Moving civilisation to permanently live underground has proven to be very difficult mainly due to humans not being accepting of life underground. However, a solution that can help with the problem of rapid urbanisation could be to move certain short-term leisure activities underground, whilst still maintaining the connection with the aboveground environment. These activities can range from commercial shopping centres, sports facilities, hotels and perhaps in the future some office jobs can also be moved underground.

In addition to this, moving short-term activities underground will ease the pressure off overcrowded spaces aboveground and slowly change the negative associations with the underground. This transition can reduce the feeling of isolation and claustrophobia associated with the subterranean environment; consequently people will feel that they have the freedom and flexibility to leave whenever they would like without feeling like they are permanently stuck underground.

To end this essay a statement by author Lydia Kallipoliti: “Oxygen-regenerative space capsule might become our image of the ideal environment,” (Kallipoliti, 2015). Kallipoliti is highlighting here that we might never be able to create the ideal environment for humans, and that potentially the only way this can happen is if we provide oxygen controlled capsules for humans to live in. In other words, the existing urban environment is not perfect, there will always be issues with the living conditions that need solving. Experimentation is still taking place to ensure the following generation lives a more comfortable and optimal life than the previous generation.

In conclusion, the underground has great potential, and perhaps the next step to ensuring a better life for future generations is by starting to think about the possibility of the underground and how it holds great opportunities for the future of our cities.

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