Waterworlds:

A survey of floating communities around the world

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Byera Hadley
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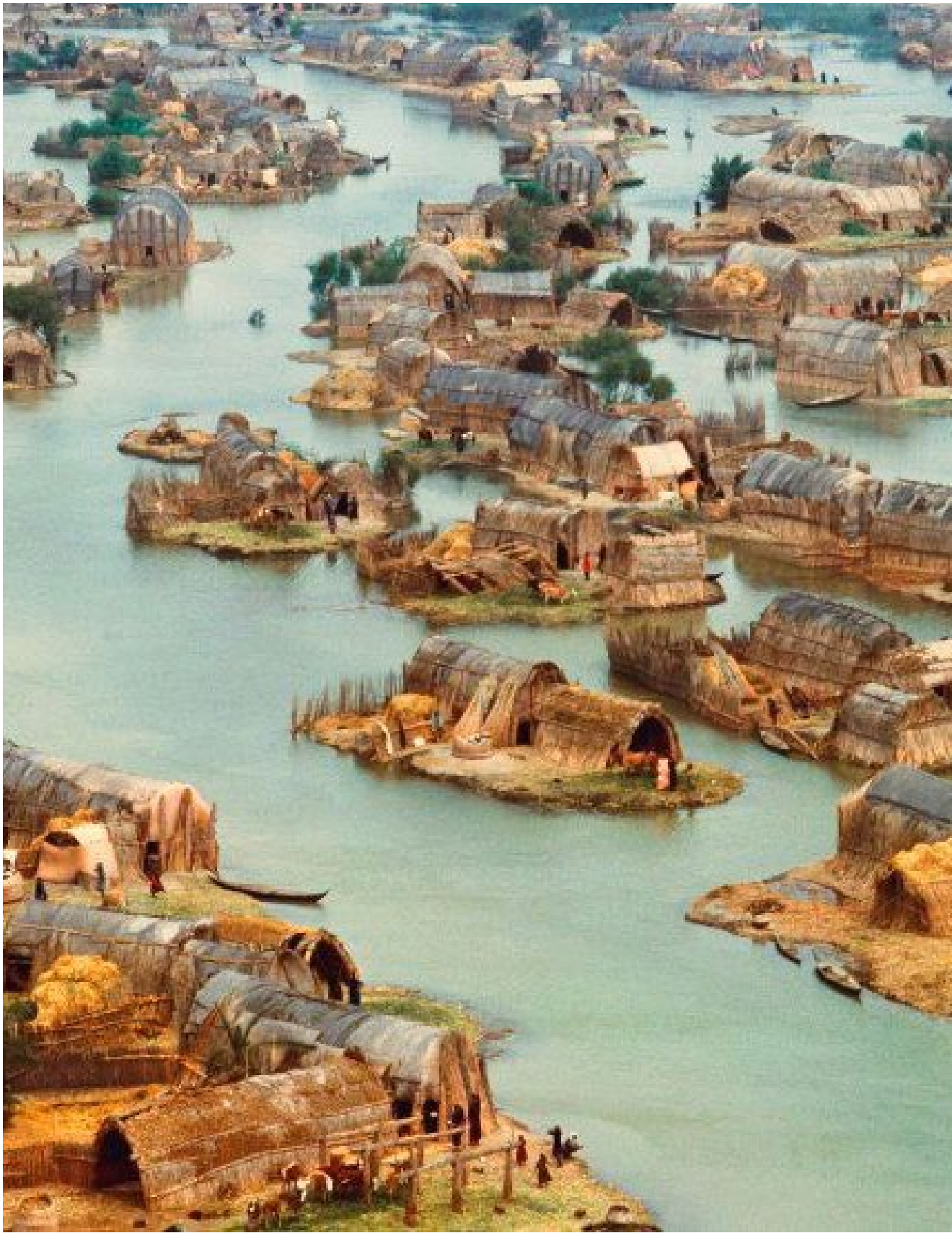

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Marshall Blecher was awarded the Byera Hadley Travelling Scholarship in 2016
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Waterworlds: A survey of floating communities around the world

The goal of the project is to help identify different approaches to some of the technical and logistical challenges of building and living on the water and hopefully to inspire new design languages for contemporary floating communities.

1

Introduction

Clusters of converted ferries in Copenhagen, rows of historic log houses in Seattle and Contemporary floating apartment blocks in Amsterdam, communities of floating buildings have arisen all around the world and throughout history for reasons including defence, affordability, access to resources, scarcity of buildable land and the simple pleasure of living on the water.

Although extremely diverse in form, there seems to be a commonality in the spirit of floating communities. A cause perhaps is the immediacy of living on the water; the constant motion of the waves, currents, tides and winds. Floating dwellings are always responding to the environment and inhabitants are continually aware of it. Communities of floating dwellings exposed to these same external conditions seem to bring people together, sharing the joys and challenges of living so intimately with the elements. In good weather the sun and water are just outside the door to be enjoyed together. In storms, floods or extreme tides, floating communities often need to works together to secure dwellings safely at their moorings or side by side. The sense of comradery in these communities is pervasive.

Despite their apparent tendency to catalyse community building, floating dwellings have rarely been welcomed by authorities or the wider communities to which they belong. They have tended to exist at the margins of cities, outside of legal frameworks and city plans, invisible on maps, and as refuges for the underprivileged and outsiders. As a result floating communities have received very little scrutiny from academics and urbanists, with only a handful of books and articles on the subject.

However there is currently an increased interest in floating architecture particularly in Europe, brought about by the increasing risk of sea level rise, massive housing shortages, de-industrialisation, cleaning of harbours and an increasing openness to alternative forms of housing.

Sea level rise in particular has propelled cities such as Amsterdam and Copenhagen for example to seriously consider floating buildings as an alternative to traditional and expensive methods of flood prevention such as dykes and sea walls and both have embarked on trials of floating developments.

At the same time the last remnants of industry and transport infrastructure which were often the cause of a harbours establishment are being driven out by increasing property prices and alternative transport options. This has left cities with underutilised harbour areas and has simultaneously allowed many cities to improve their water quality, making the harbours a more attractive place to live. Copenhagen for example now has some of the cleanest harbour water in the world, with areas suitable for bathing, fishing and mollusc farming at the centre of the city.

People are also becoming more open and interested in alternative forms of housing including floating dwellings. This is perhaps most clearly seen in the emergence of the ‘tiny house’ movement, the popularity of treehouse hotels and the increasing attraction of unusual accommodations such as yurts, tents, caravans and houseboats on platforms such as Air-bnb.

Sea level rise has forced cities such as Amsterdam and Copenhagen to seriously consider floating buildings as an alternative to traditional expensive methods of flood prevention such as dykes and sea walls and both have embarked on trials of floating developments.

These factors are combining to make living in a floating community an attractive proposition for many people. In Copenhagen it has led to a massive increase in the price of houseboats with celebrities including Architect Bjarke Ingels, buying floating dwellings and mooring sites.

This has led in turn to a slew of proposals for floating house developments which could potentially offer a more sustainable, affordable and flexible alternative to building on land. But there are many challenges to building and living on the water which are preventing the proliferation of floating communities.

The largest of these barriers perhaps is the lack established models and good precedents for the design and establishment of new floating communities. But this lack of precedent is also one of the great advantages of floating communities.

People generally don't have presuppositions about how floating communities should look or function. If handled correctly floating communities could offer an avenue for the experimentation and development of new ways of living, entirely new types of communities and could offer solutions to some issues including sea level rise and community disenfranchisement which traditional terrestrial houses, burdened by tradition and regulation have been unable to meaningfully address.

This goal of this research project is to complete a simple survey of floating communities and to catalogue some of the most diverse and interesting examples from around the world, to elucidate different approaches to some of the technical and logistical challenges of building and living on the water and hopefully to discover some alternative approaches which could be applicable in the design of contemporary floating communities.

I have chosen to use the term 'floating community' throughout the paper since it encompasses a wide range of different situations and puts the focus on the network of people and floating dwellings which to my mind make these places special.

The term 'floating dwellings' in turn, includes houseboats, which are boats or vessels that have been converted into dwellings, as well as 'floating homes' which are purpose built floating houses often with floating foundations of aerated concrete, logs or plastic.

2

A brief history of floating communities

The first known clusters of floating dwellings emerged at least 3000 years ago when Sumerian villagers are believed to have built woven houses on floating platforms of reeds.[1] These would rise with the seasonal floodwaters and provide water buffalo farmers with a secure dry place to live and work (see ch. 1). Since then floating communities have since arisen in small pockets across all inhabited continents.

In Europe people have been living in floating dwellings at least as far back as the 17th century for in 1652 the bylaws of the city government of Amsterdam decreed that no one *'may live in any storage boats, ships or barges, may install stoves or fireplaces, or partition rooms to live in'.*[2]

Despite these rules, clusters of houseboats appear in paintings and engravings of Amsterdam throughout the centuries and even feature in a painting by Monet from 1872.[3] These communities were primarily inhabited by dike workers, bargees, fishermen and their families. There are records of similar communities of floating dwellings in many European cities, particularly those associated with inland shipping such as London, Paris, Budapest, and Belgrade.

In the late nineteenth Century there was a changeover across Northern Europe from timber to more durable iron and steel sailing ships and barges. As a result many of the old timber ships were sold cheaply and converted into houseboats. This was followed by another wave of obsolescence from 1910 onwards when sailing ships were gradually replaced by motor-driven ships and when smaller transport boats were replaced by flat bottomed barges. This growing number of obsolescent ships available at scrap prices led many people to re-purpose them into yet more affordable floating dwellings.

Today there are many floating communities across Europe mainly focused mainly in cities with a history of inland shipping, with a large supply of redundant boats and with underutilised harbours. Floating communities can be found today in small pockets in Germany, The Netherlands, Denmark, Serbia, Belgium, France and Italy.

The first floating communities in America were similarly established due to a glut of obsolescent ships, in this case during the gold rush, when whaling and transport ships were moored in San Francisco Bay and abandoned by hopeful prospectors. These were rapidly converted into houses, hotels and brothels and formed an integral part of the early city.

At the same time people were building purpose built floating houses and workplaces across America. Beginning in the 1880's timber workers on the Pacific coast built houses on floating log foundations which were affordable and convenient for their river based trade.[4] And in the 1920's the great depression led many desperate people to build floating houses in the lakes, rivers and bays across America as a more affordable alternative to building or renting on land.

These communities held no legal status in terms of zoning laws, taxation and building codes. Residents needed only to find a mooring space in order to go about the business of living on the water. The moorings were often free, though sometimes minimal fees were paid to marinas or shore-side property owners.[5]

Throughout the 19th and early 20th centuries these communities were generally poorly regarded by Authorities and the wider public. They were often poorly maintained, haphazard collections of boats and floating houses and generally disposed of their waste and sewage into the waterways which they floated upon.

In the 1950's and 60's authorities and the media commonly described floating communities as 'ghetto's on the waterfront', 'unsanitary' and 'eyesores'. There was large scale clearing of floating communities due to evictions from the health department, land reclamation and pressure from private landowners and developers.

Only a few small pockets across America; in Seattle, California, Louisiana and Florida have survived until today and there are no records of new floating communities being established in America since the 1950's.[6]

There is little record of the history of floating communities in Asia although there are large communities of people living today in floating fishing and farming villages in Cambodia, Thailand, Vietnam, China and the Philippines. And it there is evidence to suggest that some of these go back hundreds of years. Indeed one of the largest known floating communities occurred in Aberdeen Harbour in the South district of Hong Kong. It was established in the early 19th century when fishermen lived and worked on their wooden *'junks'* in the bay, and peaked in the 1950's when boats formed a continuous floating bridge for 500 metres across the bay and 150,000 people are believed to have live in boats throughout Hong Kong.[7]

Similarly in Africa, there are significant communities of people living on floating houses along the Nile River in Egypt which date back from the middle of the 20th Century and large communities of people living on the Lakes surrounding Lagos in Nigeria in converted fishing boats and stilt houses. There are likely many more small pockets of people living in undocumented floating communities across the continent.

In Australia there are records of clusters of floating houses built on logs around Sydney Harbour from as early as 1910 but they have gradually been removed by the Authorities. Today there are only four remaining in the Mosman area of Sydney and there are no significant floating communities in the country.

NOTABLE COMMUNITIES VISITED DURING THIS PROJECT

1. Mesopotamian floating reed houses,Southern Iraq/Iran
2. ‘Pirathavn’ Copenhagen, Denmark
3. Lake Union Houseboats, Seattle, USA
4. Krudtbugt (Gunpowder bay) Houseboats, Copenhagen, Denmark
5. Ijburg Woonboten, Amsterdam, The Netherlands

4

Mesopotamian floating reed houses

Southern Iraq/Shadegan

Iran

Location: 30.676656, 48.538392
Founded: ca. 3000 BC
Dwelling types: inhabited floating islands
Number of residents: unknown
Number of dwellings: unknown
Legal Status: varies

Floating communities appear to go back as far as civilisation itself. Engravings on pottery dating back around 5000 years to the time of the Sumerian empire, show some of the earliest settlements of Mesopotamia — "the land between the rivers" — were built on floating reed islands in the wetlands at the mouth of the Tigris and Euphrates rivers one of the first places where human beings developed agriculture, invented writing and worshiped a pantheon of deities.[8] Some of these communities survived in the extremely isolated wetlands in an area that borders modern day Iraq and Iran right up until the beginning of the 21st Century and possibly even to the present day.

Very little is know about the history of these floating communities until the first European explorers visited and documented the area in the mid 20th century. The best know was English explorer Wilfred Thesiger who documented his travels through the Iraqi Marshlands in his book *The Marsh Arabs* (1964).

Thesiger describes a hidden world with hundreds of small settlements and larger villages made from floating islands known as *kibasha* as well as some more permanent islands which did not float known as *dibin*. He explains that the kibasha were built using the endemic *qasab* reed, a giant bamboo like plant that grows up to 8m high, layered with buffalo dung and mud.

These communities were inhabited by a group known as the Madan or Colloquially as 'Marsh Arabs' despite their different racial background and appearance to Arabs. The Madan were traditionally Buffalo farmers and also hunted wild birds and game, fished and farmed dates.

The floating islands were used for every aspect of life. They were generally fixed in place and small dwellings made from woven reed mats as well as larger *Mudhif* buildings which served as guesthouses and meeting places for village elders were built upon them. The Madan used narrow wooden boats known as *Mashoof* and *tarada* to get between the islands, to collect the giant reeds and for hunting and farming.[9]

Unfortunately much of the marshlands were destroyed in the 1990's and with it the floating communities. After the First Gulf War in 1991, Saddam Hussein aggressively revived a program to divert the flow of the Tigris River and the Euphrates River away from the marshes in retribution for a failed Shi'a uprising. This was done primarily to eliminate the food sources and sanctuaries of the Madan and systematically converted the wetlands into a desert, forcing the Madan out of their traditional communities in the region. Only a few thousand of the nearly half million

“Not far in the high grass, we reached a small circle of open water, in the centre of which some men were sitting on a floating bed of reeds. Their island was twenty feet in diameter and on it they had a hut, some green sedge, a buffalo and a diesel generator.”

Stewart, The Prince of the Marshes 2003

original inhabitants remain. Most of the rest that can be accounted for are refugees living in other Shi’a areas in Iraq, or have emigrated to Iran.

After the overthrow of Saddam in April 2003 when only around 5% of the wetlands remained, local people began breaching the dikes and dams and blocking the canals that had drained the wetland. This has been successful in restoring some water flow to the marshes and almost half of the roughly 20,000 square kilometres of wetland has been re-flooded.

A account of the floating communities was made after the decimation of the wetlands in 2003 by British writer and politician Rory Stewart, who’s book *The Prince of The Marshes: and Other Occupational Hazards of a year in Iraq*, describes his experiences as Coalition Provisional Authority Deputy Governor of the Iraqi province of Maysan. In it, Stewart describes his exploration of one of the remaining areas of Iraqi marshlands and discovery of an isolated and temporary floating island:

“Not far in the high grass, we reached a small circle of open water, in the centre of which some men were sitting on a floating bed of reeds. Their island was twenty feet in diameter and on it they had a hut, some green sedge, a buffalo and a diesel generator. Once, Marsh Arabs lived on floating platforms year-round; but this was a temporary home for harvesting and fishing. Like almost all of todays Marsh Arabs, these men lived on dry land.” [10]

But It is unlikely that the conditions which precipitated the floating villages will ever return. The marshlands which were once among the world’s most biologically diverse, supporting hundreds of varieties of fish, birds, mammals and plant life, are fed by the annual snowmelt in the mountains of Anatolia in Turkey and ongoing dam projects in Turkey, Syria and northern Iraq, have interfered with the annual flooding of the marshes.

Today there is no record of people continuing to live on traditional floating reed islands in Iraq or Iran. A long and close study of the wetland areas on google earth shows that there are clusters of traditional woven dwellings in the wetland area surrounding the Iraqi city of Chibayesh, but these appear to be built on dry land.

There is a small community living on the Iranian side of the border at a place called shadegan but since the water levels of the wetlands are controlled by dams and irrigation channels, they no longer build floating reed islands and it seems unlikely that the Madan will ever return to their floating wetland homes.

Journal excerpt:

Search for the Marsh Arabs

A single photo (previous pg.) found in a dusty textbook led me to discover the story of the Madan and the floating world which they had created and initiated this research project.

I dreamed of this community of floating reed islands, of woven houses, buffalo farmers and bird hunters and read all i could about the area but was unable to find out if there was still any pockets of people living in this way.

I spent hours exploring the lowlands of Iraq on google earth and found some promising signs, clusters of arched yellowish buildings in the wetlands around the town of Chibayesh. I got in contact with some conservationists and academics in Iraq who were able to confirm that there were some clusters of Madan living in traditional reed houses although I was unable to find out if they were still building and living on *kibasha* or floating reed islands.

Despite my best attempts I was unable to attain a visa in order to visit Southern Iraq and attempt to find remnant floating communities. I did however manage to visit the border region between Iraq and Iran where I located a small community of Madan living in a settlement on the Shadegan ponds wilderness reserve.

To get there I flew to Tehran, took a two day bus through the central Kavir desert and across the Zagros mountains to the oil mining city of Ahvaz. The city is the second hottest in the world after death valley in California and was reaching highs of 52 degrees celcius during my visit.

From Ahvaz i took a car 3 hrs toward the Iraqi border to an area called Shadegan. I arrived to find a small and shabby settlement based around a lagoon and surrounded by hectares of wetland. The town was entirely empty and I was left wandering around the bank of the lagoon looking for remnants of Madan architecture and possibly even a floating island.

After 15 minutes a woman and her daughter spotted me outside in the heat and cheerfully pulled me by the sleeve into the centre of a courtyard, proudly showed me their two buffalo and then invited me to sleep in a concrete sleeping room, about 2.5x2.5 metres with three air-conditioning units projecting from it.

In the evening I awoke and the temperature had dropped to a manageable 40 degrees. I showed the family a picture of some of traditional woven buildings and islands that i was looking for. They understood immediately and guided me to a nearby clearing where the community had built a small version of the traditional mudhif, not on an island but in a stony clearing between concrete buffalo sheds.

Many of the Madan customs seem to have survived in the Shadegan area. Some traditional buildings are being made, buffaloes and dates are still farmed and men still wear long black gowns and hunt on the wetlands in the traditional wooden boats known as Mashoof.

But the tradition of artificial floating islands is gone in this area at least. The water levels in Shadegan are controlled by dams and irrigation channels making them unnecessary.

The search continues!

3

Pirathavn
Copenhagen, Denmark

Location: 55.682267, 12.609587

Founded: 2011

Dwelling types: converted fishing boats, yachts, lean-to floating houses

Number of residents: Approximately 90

Number of dwellings: 64

Ten minutes cycling south from the centre of Copenhagen brings you to the edge of the medieval city, defined by a low earth mound and a shallow zig-zagging moat of green water. On one side of the moat are rows of former naval barracks now converted into the Danish architecture school and on the other bank approximately 150 metres away, is the world famous noma restaurant built onto the back of a WW2 fortress and surrounded by scrappy oak forest. Clinging to this bank, amongst the reed-beds and water grasses is a salmagundi of half-sunken wooden boats, handmade pontoons, floating garden beds and a colourful mess of flotsam and jetsam. Around 80 people live in this small floating community known variously as 'Fredens Havn' (Peace Harbour) or 'Pirathavn' (Pirate Harbour).

The settlement was established in 2011, when a small group of small wooden boats moored in the previously unoccupied harbour. It has grown significantly since; old yachts and fishing boats have accumulated around fixed central mooring posts and some residents have constructed lean-to floating houses from discarded building materials on improvised rafts of plastic and metal barrels. Some of the boats have been connected to the mainland with flimsy floating bridges while others continue to use small rowing boats and rafts to access the shore.

The settlement occupies a legal grey zone and the authorities have attempted to abolish it on two occasions since 2011. According to the Danish Coastal Directorate, the residents of Fredens Havn have built an illegal port and damaged or removed historical naval defence facilities, notably a memorial commemorating the area's historic position as the home of the Danish navy. (politiken 2016). The Danish Cultural Authority (Kulturstyrelsen), the Outdoors Council (Friluftsrådet) and The Danish society for Nature Conservation (Naturfredningsforening) have all supported the decision to remove the dwellings in 2015 and again in 2016. But each time the residents have ignored the demands and continued living and developing the area.[11]

Indeed the residents claim that they are entitled to take advantage of Copenhagen's historic law permitting ships to moor for free in the cities waters if they are free sailing vessels. The self appointed president of the Fredens Havn community, Esben Banke, has begun fighting for the legal protection of the community.

ORGANIC DEVELOPMENT

Fredens Havn exists completely outside of the strict regulations which cover the development of new Danish housing. It has grown entirely organically from an unorganised community of itinerant people using mostly found materials.

Counter cultural floating communities such as Fredens havn could provide a fertile starting point for the development of new design practices and new paradigms for the ownership, design and development of built space free from the firmly established terrestrial mainstream.

Many would argue that Fredens Havn is a strong argument for the endorsement of such regulations given the environmental issues and the condition of the settlement. The dwellings do not have waste disposal systems and instead rely on a handful of portable toilets along the shore, they do not have access to fresh water and only a few have solar electricity. The individual dwellings are not especially well made and are considered a blight on the landscape by many Copenhageners, poor construction and lack of maintenance has led to at least four of them to sink in the harbour where they remain today as wrecks.

However the area does provide an interesting example of organic community development and perhaps even an extreme version of up-cycled architecture. It also serves to highlight one of the core distinctions that separate floating communities from the terrestrial and infuse them with so much potential but also a great deal of difficulty; notably the lack of precedent and associated controls and regulations.

While every Dane has a clear idea of what a summerhouse, apartment building or Suburban Villa should look like, houseboat communities are almost uniformly heterogeneous and often a little anarchic. The lack of a clear typology among floating dwellings, combined with the unique requirements of a floating building make floating architecture a fertile space for experimentation.

Over the years rules and regulations have accrued around construction, ownership and maintenance of terrestrial housing. Copenhagen, for example, has some of the most stringent sustainability controls in the world requiring all new houses to be almost air-tight and hyper insulted with heat exchanges and triple glazed windows.

These and other regulations have been effective in creating high quality housing stock and by many measures great communities. But they don't leave a lot of space for people who are interested in alternative living, in self building, experimentation or the organic development of place.

The harbour and the open sea around Denmark and many other countries largely fall outside of this set of regulations. The harbour has its own authorities but these were set up to deal with industrial boat traffic, water safety and tourism rather than housing sustainability and property and as can be seen in Freden's Havn these are not particularly well enforced.

It is this very lack of rules and regulations which makes Fredens Havn an interesting urban experiment. Counter-cultural floating communities such as this could provide an interesting starting point for the development of new design practices and new paradigms for the ownership, design and development of built space free from the firmly established terrestrial mainstream.

4

Lake Union Floating Houses

Seattle, USA

Location: 55.682267, 12.609587
Founded: ca. 1880
Dwelling types: Timber floating houses
Number of residents: ca. 1200
Number of dwellings: ca. 500
Legal Status: Legal

The first floating communities in the Seattle area were clusters of simple wooden shacks built on logs to provide affordable and convenient offices, workspaces and bunks for the lumbermen in the 1880's. These structures were built from the timber which was transported and processed along the waterways and were variously called 'floathouses', 'boathouses' and 'cookhouses'. [12]

The floathouses were built on an inverted triangle of large cedar logs strapped together and topped with a grid of floor joists. Over these floating foundations, which can last well over 100 years before becoming waterlogged, workers built single storey gable roofed structures clad in shingles or wooden boards.

In the 1890's some of the more affluent families living in Seattle began to build floating weekend cottages in and around the working class floating communities on Lake Union. These were often highly decorated and elegantly proportioned houses with hip roofs and surrounding verandahs.

In 1909 the Alaska-Yukon-Pacific Exposition, one of the first World's Fairs, was held in Seattle, celebrating the expansion of the Northwest and dozens of floating 'teahouses' providing bootlegged liquor, gambling and entertainment, were built on lake Union to serve visitors In the following years many of these teahouses were converted for residential living, some of which survive today.

Indeed the oldest existing houseboat in Seattle known as the 'Hostess House' was originally built as an information centre for the expo.

During the depression houseboat living again became extremely popular although this time for different reasons. Houseboats offered the cheapest possible way to shelter ones family, with no rent or fees and access to free food through fishing. This trend resulted in a new typology of floating dwellings known as 'Floatshacks', extremely simple and small lean-to dwellings often made from found materials on improvised floating foundations.

Prior to World War 2 the number of people living in floating communities peaked with approximately 2500 'boathouses', floating cottages, converted teahouses and 'floatshacks' in the Seattle Area; on Elliot Bay, the Duwamish River, Portage Bay and Lake Union.

At the time the communities comprised predominantly working class housing, they were unregulated, disconnected from city infrastructure and widely considered a fringe and undesirable part of society.

In 1952 an ordinance was passed declaring all houseboats unsanitary. There were several attempts by residents to fight the ruling and defend their rights to live in floating communities but most failed and many houseboats were cleared during the following decade.

Is it the fact that these communities are built on the water alone that makes them special to so many people. Or is it the marginal history of houseboat communities, and the an eclectic mix of outsiders with irreverent ideas and ways of living that make floating communities such interesting places.

Today there are approximately 500 floating homes in the Seattle area most of these moored along the edge of Lake union. These survived largely due to community organisation and lobbying by the 'Floating Homes Association' which was formed in the 1962 and helped to improve the reputation of the floating homes particularly by connecting the community to city sewers.

The Lake Union floating homes today are extremely varied in form and architectural style. Many of the newer homes have been designed by local architects and builders who specialise in working with floating dwellings but don't seem to favour a particular style. You can find three storey shingle clad lodges, contemporary glass and timber boxes, eccentric plant covered bungalows and small colourful shacks as well as some of the original timber dwelling.

The dwellings are interspersed with patches of open water, spotted with kayaks, small boats, and occasional yachts. They are connected by a network of plant covered piers with benches, bbqs and common spaces. The amount of effort put into the maintenance of these common spaces as well as the large number of welcoming porches, verandahs, open doors and windows attests to the communal spirit of the community.

In recent years the Seattle's real estate market has skyrocketed in value and the houseboats of Lake Union have far exceeded the average price growth with larger houses now regularly sold for over 3 million dollars. This has led to a new trend, to extend or build new houses to the maximum permitted size allowed by the building code in order to maximise profits with no verandahs and no space given to dockside seating.

As the traditional modest cabins are gradually being replaced with large and unarticulated houses so are the workers and artists who found refuge here, being steadily replaced by millionaires from the Seattle's technology sector.

The alignment of building regulations with those effecting terrestrial buildings and the changing demographics of the Lake Union floating houses are arguably reducing the charm that attracted people in the first place.

Is it the fact that these communities are built on the water alone that makes them special to so many people. Or is it the marginal history of houseboat communities, and the eclectic mix of outsiders attracted or forced into these areas that make floating communities such interesting places.

2

Krudtløb (Gunpowder bay) Houseboats

Location: 55.682267, 12.609587
Founded: 2000
Dwelling types: converted car ferries, floating houses, converted steel hulled ships
Number of residents: Approximately 110
Number of dwellings: 63

On the eastern outskirts of Copenhagen, at the edge of the formerly industrial island of Refshaløen is a small protected bay supporting a community of 63 stationary houseboats. Krudtløb as it is known, is one of the few remaining legal houseboat communities in Copenhagen and a good example of a successful collaboration between Authorities, Landowners and houseboat dwellers.

The bay is bordered to the West by Nyholm, a small island occupied by the Danish Naval Forces, densely packed with historic Naval storehouses, barracks and offices and surrounded by small naval vessels. To the East is a patch of private land with industrial buildings cum offices dotted in the landscape.

The houseboats cling to the Eastern edge of the bay and are connected by modern steel gangways and steps to the shore. Amongst the them is a Dutch barge, a converted North sea fishing vessel, a British narrow boat and a handful of converted tugboats and working boats. But the most common typologies by far are the converted car ferries and custom built floating houses.

While cities like Amsterdam and London had large inland shipping industries during the 20th Century that were gradually replaced by road and air transport toward the end of the century and led to an enourmous glut of cheap steel barges and narrow boats left to be re-purposed into floating houses Copenhagen is in an isolated position on an island and so never had a supply of cheap and well sized boats to use for housing nor a large network of waterways to moor the houseboats. But it does have a long history of ferry transport.

Car ferries once connected the hundreds of islands in the Danish archipelago but have steadily been superceded by bridges. This has led to a large number of the obsolete steel and timber hulled boats coming onto the market and beginning in the 1970's being converted into floating dwellings.

The ferries are typically between 20 and 30 metres long with a flat car deck 6 metres wide, enough for two cars side by side, above the deck there are small raised pilot houses and occasionally a small passenger deck.

Boatbuilder Laust Norgaard from Slusens Bydbyggeri, who has been responsible for converting the majority of these ferries, has used a similar template for all of the conversions. Expansive open plan living spaces have been inserted into car decks with large openings at each end, bedrooms and bathrooms have been inserted into the steel hulls while the pilot houses have been used for secondary living spaces, libraries and lookouts.

The custom built floating houses in Krudtløb on the other hand are much more diverse in composition. They are built either on floating concrete foundations which are

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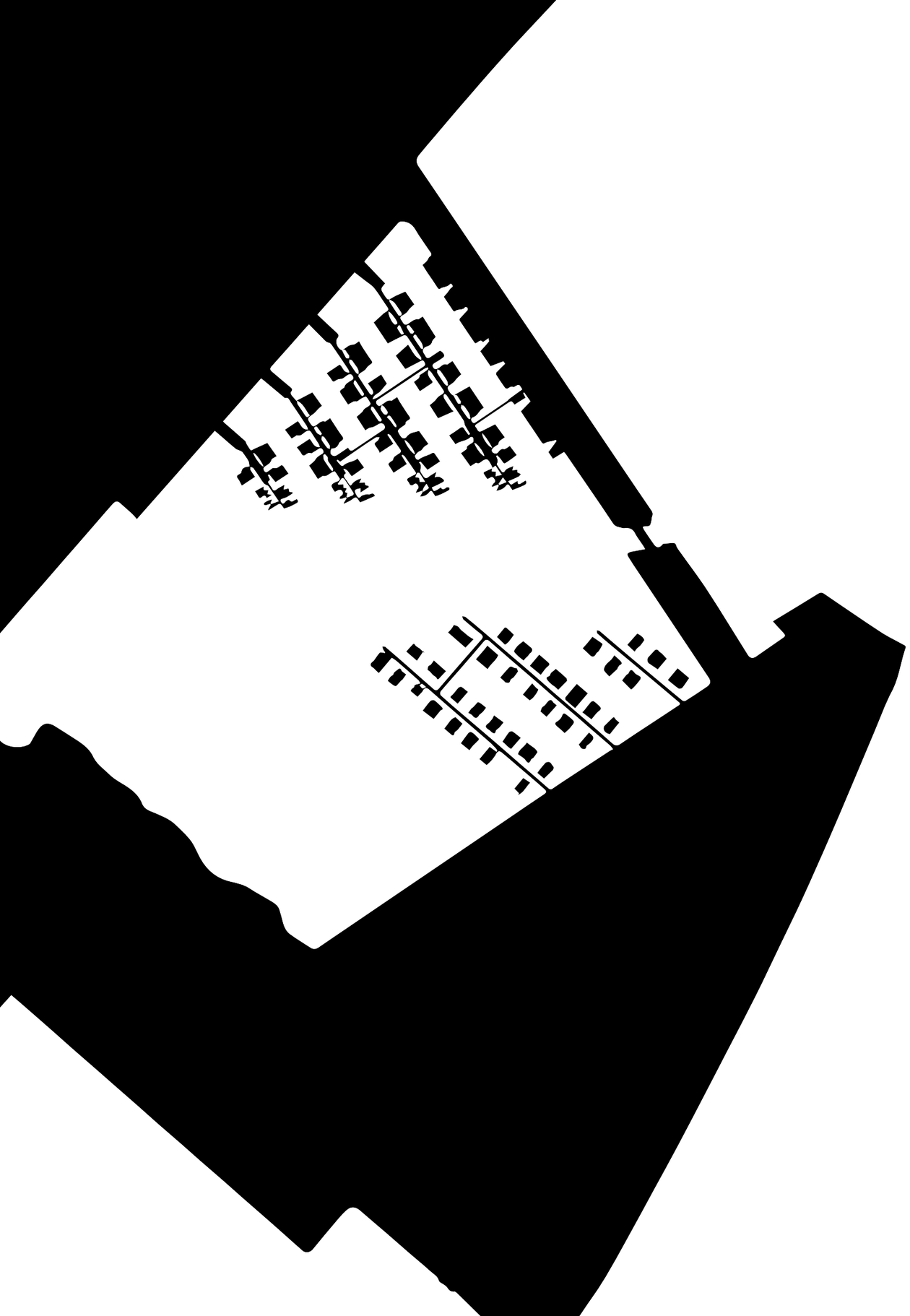
made simply by pouring reinforced waterproofed concrete around large styrofoam blocks, or on open rectangular concrete hulls, which provide additional usable space below the water line.

The floating dwellings at Krudtløb rent mooring spaces from the private landowner who owns the area, they are connected to city water, heating, sewage and electricity and from 2018 they will need to meet the same standards for insulation as terrestrial dwellings. The houseboats are registered by the City council, inspected by the Danish Maritime Authority and moorings are inspected by the Harbour Authority. Despite the increasing regulation of houseboats in the area, the community retains a sense of eccentric vigour, It is a popular spot for tourists to visit and is welcomed by most of the residents in the area.

The success of the community has led to an increase in the value of houseboats with good examples of converted ferries being sold for upwards of 10 million Danish kronor (2 million AUD). This in combination with a massive housing shortage has led to an increase in demand for mooring sites around the harbour and a wave of new projects.

One notable project by BIG, which aims to install six floating student apartment complexes known as 'Urban Rigger's' in a flooded dry dock immediately to the North of Krudtløb. Other recent proposals for the area include large developments of concrete hulled floating houses and apartment blocks which look indistinguishable from terrestrial houses.



3

Ijburg Woonboten

Amsterdam, The Netherlands

Location: 52.363397, 4.983903
Founded: 2000
Dwelling types: concrete hulled floating houses
Number of residents: Approximately 250
Number of dwellings: 110
Legal Status: legal

About one third of the Netherlands is below sea level, built on reclaimed land protected by a complex network of dykes and dams. There is significant anxiety about living in these areas, particularly since 1953 when failing dams led to massive floods and the loss of over 2,500 lives.

This is only being exaggerated by the impending threat of sea level rise due to climate change. Indeed if current IPCC predictions prove accurate then over 50% of the Netherlands could be flooded by the end of the century without a massive and expensive expansion of flood defences.

The current model for new housing in Amsterdam, exemplified by the islands of Ijburg require expensive and environmentally damaging dredging of lagoons and the construction of dykes and sea walls which are cannot easily protect against continual sea level rise.

Moreover, the Dutch government estimates that 500,000 new homes will be needed in the next two decades to meet demand, but there's not enough urban land to sustain that growth.

As such, it's no wonder that the Netherlands has become a Ground Zero of sorts for floating housing. While exact numbers aren't available, experts estimate that thousands of floating homes already exist in the Netherlands, ranging from converted barges to expansive and modern glass, steel and concrete floating houses.

A NEW APPROACH

An hours bike ride from the centre of Amsterdam along a concrete freeway takes you to the six islands of IJburg which includes one of the few contemporary floating communities in the world.

Prior to 2000 the area was a patch of water at the nondescript edge of lake Ij, but through a combination of dredging and infill, the area has been converted into a chain of low earth and concrete islands covered in over 18,000 homes with 6,000 earmarked for low income residents. 110 of these homes are floating on individual concrete hulls in an artificial lagoon between two of the new islands. While they are only a small part of the IJburg development they represent a significant new approach to housing development and design in the Netherlands.

The floating houses were designed by Architectenbureau Marlies Rohmer, their 'hulls' sit half a storey below water level and support a lightweight steel construction which is fitted with wooden floor and wall construction to make rooms and floors. Bedrooms and the bathroom occupy the lowest story, which is partly submerged. The main floor, around 1m above water level houses kitchen and

The steel gangways which wind between the houses are decorated with plants, benches and children's toys just like in Seattle and Copenhagen. Residents are welcoming and friendly, chatting with neighbours and tourists alike.

dining spaces while the main living area and an open terrace occupies the cantilevered upper floor. Sun rooms, verandas, floating terraces, awnings, etc. can be easily attached to this skeleton frame. The floating houses, work with the elements; they do not require significant earthworks and they are able to adapt to sea level rise and flooding.

The houses were built at a shipyard about 65 km north of IJ Lake on a tight budget, then tugged though canal locks, which means the houses couldn't exceed widths of more than 6.5 meters. And to ensure that the homes don't drift away or into one another, they are anchored to the lake bed by steel mooring poles.

The community provides an interesting counterpoint to the organic houseboat settlements of Seattle, Copenhagen and surrounding regions of Amsterdam. They have been developed in a similar way to traditional terrestrial homes with a collaboration between a developer and the local council, the dwellings float freely but they are classified as immovable properties by financial institutions. The dwellings are modular and lack the materiality and detail of traditional houseboats. And yet something of the spirit of traditional houseboat communities remains. The steel gangways which wind between the houses are decorated with plants, benches and children's toys just like in Seattle and Copenhagen. Residents are welcoming and friendly, chatting with neighbours and tourists alike.

8

The future of floating communities

Living on water is in a transitional phase. Throughout history, and particularly in the 20th century, floating communities have existed at the margins. From the persecuted Madan hidden in the Iraqi marshlands to the undocumented Copenhageners behind Fredens Havn, floating communities have been established and occupied by outsiders and free thinkers in peripheral spaces.

Communities of houseboats, floating houses, shantyboats and floathouses filled gaps in the landscape; on municipal outskirts, in hidden, indeterminate waters and post-industrial harbours. The communities thrived, unregulated, gradual and initiated by individuals. They provided refuge for the poor, the displaced and the eccentric but they have also tended to occupy a place of uncertainty.

There is currently an increased interest in floating communities particularly in Europe, brought about by the increasing risk of sea level rise, massive housing shortages, de-industrialisation and cleaning of harbours and an increasing openness to alternative forms of housing. This has led houseboat prices in Europe and America to spike and even to exceed the price of comparably sized terrestrial dwellings.

In turn there has been massive transformations in the culture and architecture of established floating communities. Working class residents are being bought out by the upper middle class and eclectic and whimsical structures being replaced by modern steel and glass structures floating on concrete hulls.

At the same time new types of floating community such as the Ijburg woonboten are being initiated by developers and councils rather than individuals.

These new floating communities could offer unique new models for urbanisation. The energy and self organising qualities of communities like Fredens Havn and Lake Union could be harnessed and developed organically outside of normal constraints of urban development. Floating artificial islands such as those used by the Madan could replace plots of land in low lying flood prone cities, movable, affordable and with a smaller impact on the environment.

But we should move forward carefully, our waterways are a great public resource and often the largest open public space in a city. We have seen that the charm of floating communities comes at least partially from their marginal nature. If the waterways end up being organised and controlled in the same way that land is, it is unlikely that the outcome will be as compelling.

9

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10

About the author Marshall Blecher

Marshall Blecher is an Australian architect now based in Copenhagen, Denmark. He spent his first year in Denmark living on and restoring a converted wooden motorsailer from 1963. He since gained an appreciation for life on the water and has worked on projects including a proposal for a floating fishmarket in the centre of Copenhagen, floating communities along the Thames in London and a floating island park in Copenhagen's Nordhavn.

Marshall holds a Masters degree from the Royal Danish Academy of Arts, School of Architecture and has also completed programmes at Sydney University and Lund University in Sweden.

Marshall is the recipient of the Australian Institute of Architect's First Degree Design Prize, He is nominated for the 2018 Surface travel Award and the 2018 Beazley Design Award hosted by the London design Museum. Marshall has twice won the CHART Art fair Architecture competition and the regional Superstudio design competition. He also received the prestigious Hezlett Bequest travelling Scholarship in 2013.

Marshall continues to work independently as a residential architect across Scandinavia and Germany.

See more work at www.marshallblecher.com

11

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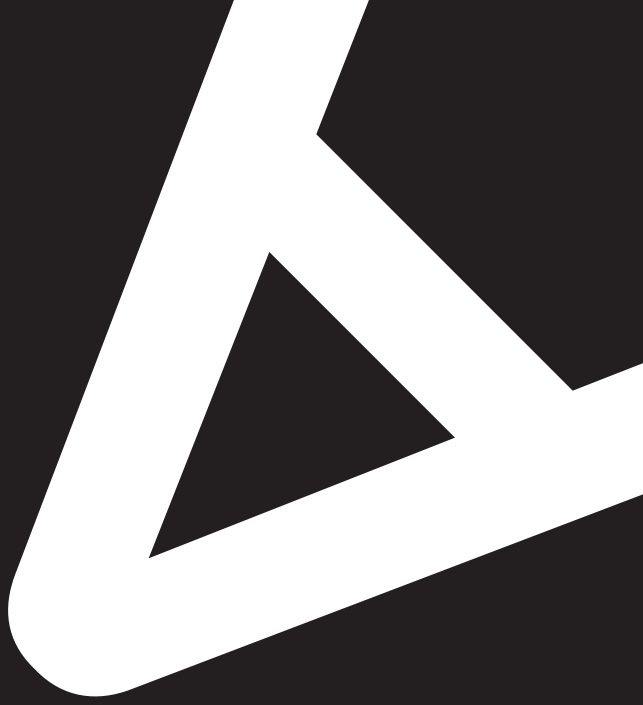

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