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## The form of the floating house in the Czerniakowski Port in Warsaw

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### Abstract

The article discusses the architectural expression of houses built on water, based on the design process of the floating house in the Czerniakowski Port in Warsaw, designed by Mai Bui Ngoc and Rafał Mazur. The question of the form of the floating house was the starting point of the work on this project. Usually buildings are designed in a specific location, which gives architects an inspiration for the design of the new form. In the case of the floating houses the goal was to make a universal artefact as a car or a phone. This artefact should be more connected to the owner than to the landscape. This artefact should be also neutral to the landscape and it should not be destructive for the surroundings. The answer lays between two archetypes; a typical house and a boat. Analysis of the existing floating houses gave the conclusion that authors of these houses were usually very close to one of these two archetypes. It is a need to put a lot of effort to design an object which does not remind a real house and a yacht design.

**Key words:** *amphibious architecture, architecture in Warsaw, architecture of climate change, floating house*

### INTRODUCTION

The design and realization of the floating house in the Czerniakowski Port in Warsaw was a pioneering task. It was the first two-storey floating residential building in Poland. On the most part, the design process required the use of new technical, functional and aesthetic solutions. The largest challenge was to design an architectural form, which would fulfil the unique function of a floating house in comparison to a house built on dry land. Its specific practical solutions also had to distinguish it from ships, barges and yachts.

Floating houses may become a necessary alternative to building on dry land [FLESCHE, BURCHARD 2005]. Climate change, a decreasing availability of space for construction in Polish cities due to the mass acquisition of land by developers, as well as the need to live near nature, make this form of living increasingly attractive [GRONOSTAJSKA, CZAJKA 2013]. Despite the fact that many floating houses have already been built, their architectural form has not yet been fully defined and is often treated as a land-based building or an object with solutions typical for a yacht. The

floating house in the Czerniakowski Port in Warsaw seems to be a good example to analyse in terms of defining the assumptions required in the architectural form for this type of dwelling.

The first important work concerning floating houses in Poland was a research paper written by PIĄTEK [2018]. The author proposed the definition of a floating house as “a floating structure with permanently enclosed interior and arrangement designated solely for stationary use, without propulsion, equipment or other characteristics used for navigation.” [PIĄTEK 2018]. He also looked at what had already been achieved in Poland in this relatively new area in architecture. A description of the titular project of this article was also included in his work. The floating house in Czerniakowski Port has also been featured in various architectural journals, including the magazine *Architektura & Biznes*, which featured an interview with its authors [KAPOLKA 2017].

There are many publications about floating houses in English language literature. They mostly deal with popular achievements in this area as seen in the United Kingdom and the Netherlands [NILLESEN, SINGELENBERG 2011].

## METHODS

The basic research method should, in this case, be an analysis of the most important issues, which influence the architectural form of the floating house. An important problem seems to be the need to create objects of this type in the context of humanity's relationship with nature. An analysis of historical floating objects will allow to better understand this relation on a wider scale. Functional and technical aspects, which directly influence the form of the object, are also important.

The question of aesthetics is connected to function and structure, however, it is also necessary to analyse elements which distinguish floating houses from other floating objects, as well as buildings constructed on dry land. The identification of these elements will help answer the question about what a floating house is and what it should look like.

## RESULTS

### THE FORM OF THE FLOATING HOUSE

**Relation with nature.** In the publication entitled "Amplifying Nature", which accompanied an exhibition in the Polish pavilion at the Architectural Biennale in Venice, Anna Ptak wrote, "that architecture is interconnected with the forces of nature is a fact, as demonstrated by local vernacular architecture." [PTAK 2018]. The move away from traditional solutions and a divergence from the rhythm of the planet seems to be the most important problem of the habitation process in the Anthropocene epoch. The change in Poland's natural habitat is connected to a change in its water environment, which was at one time a fixed element that influenced architectural space [TWARDOWSKI, ŻABICKA 2018]. The architecture of rural households, the so called 'Olender' homes (Photo 1), typically built on wetland along the northern part of the Vistula River between the 16th and 20th centuries [SZALYGIN 2011], shows that



Photo 1. Traditional 'Olender' home with a lower level utility room that is periodically flooded and a boat used for travel and evacuation purposes; Antique building museum in Wiączemin Polski (Pol. Skansen Osadnictwa Nadwiślańskiego) (photo R. Mazur)

people were able to adapt to natural phenomena even if it was as difficult to deal with architecturally as wetlands tend to be [KUCIEWICZ, DE IACOBIS 2019]. A harmonious coexistence with the natural world will be the only rational form of habitation in the future. For many reasons life in the vicinity of water sources has always been a traditional element of habitation [JAGIEŁŁO-KOWALCZYK 2012]. Water is necessary to the survival of humankind. It also influences people's aesthetic preferences [DUTTON 2009].

A floating house may become a form of habitation that will help people to strengthen their ties with nature. It also serves as an alternative form of living in the context of climate change and its aftermath. A decreasing volume of land suitable for construction, rising water levels and increasing number of natural disasters are currently being seen as a challenge by many architects. Projects such as the floating city concept designed by Bjarke Ingels Group, man-made islands off the southern coast of Copenhagen designed by Urban Power and Palm Jumeirah in Dubai designed by Helman Hurley Charvat Peacock, are some examples.

**The tradition of building on water.** Living on water or in its vicinity is a traditional and even typical phenomenon historically occurring in Poland. The island settlement in Biskupin dating from the 8<sup>th</sup> century BC, built on wooden beams, is an excellent example (Fig. 1). Slavic settlements were also commonly erected near bodies of water with a proto-city pre-located in Pułtusk in the 12th century [STABROWSKA 2015]. Palace architecture is also commonly associated with construction near or on water. A magnificent example of this is the Palace on the Water designed by Dominik Merlini in the Royal Łazienki Park in Warsaw [TATARKIEWICZ 1955].



Fig. 1. Visualization of the proto-city in Pułtusk prepared by ASK, Faculty of Architecture, Warsaw University of Technology; source: KOWAL [2015]

There are a lot of examples of floating houses in Warsaw's history. Canaletto's painting, which depicts an 18<sup>th</sup> century panorama of the city seen from the eastern riverbank (Photo 2), shows floating objects which were hybrids of boats and houses [RYBKA, MAZUR 2018]. Buildings that are reminiscent of traditional houses with gabled roofs positioned on their shell, generally seem to be a very



Photo 2. A fragment of Warsaw's panorama from 1770 – Bernardo Bellotto Canaletto; source: JUSZCZAK and MAŁACHOWICZ [2007]



Photo 3. A fragment of Aleksander Gierymski's painting "The Feast of Trumpets" (1884); source: wolnelektury.pl [undated]



Photo 4. A floating police station on the Vistula River in Warsaw – from the 1930s (phot. National Digital Archive, signature: 1-G-4640-5)

characteristic element of the Vistula's landscape. Similar objects, built where land meets water, can be found in 19<sup>th</sup> century art by Aleksander Gierymski (Photo 3).

Many floating houses can also be seen in photographs from the 1930s. They usually had roles associated with the functioning of the Vistula River as it flowed through War-

saw [MISTEWICZ, TUCHOLSKI 2017]. They varied in form. On the most part they were reminiscent of barges or typical land-based dwellings such as harbours or smallish houses with gabled roofs. An interesting example was a floating police station whose form was perfect for its specific location, as well as its floating foundation (Photo 4). This object did not look like a barge while at the same time differing from land-based buildings.

## LIVING ON THE WATER

Living solutions in floating houses are the direct result of everyday human needs as in land-based buildings, but the specific nature of living on water requires some different ideas to those usually seen on land. The floating house in the Czerniakowski Port was designed to have two storeys (Fig. 2), but in a reverse manner to traditional residential houses. The bedroom is located at ground level, which is often the case when designing yachts. The living room and an open kitchen can be found on the first floor. Its location allows a better view of the surroundings and better access to the terraces. One of these is on the first floor and the other on the flat roof. It is very important to design a large area of glazing in such a way as to open the house to the water. The facade, which contains the entry way from the port side, has few openings in order to guarantee privacy.

The floating house has a usable space of 120 m<sup>2</sup>, which allows the inclusion of fundamental functions typical for a land-based house in Poland. These include two bedrooms, an office/guest room, two bathrooms, two utility rooms, as well as a large living room with a kitchen and two terraces. This means that a family with children can live there in comfort. Thus, it is a realistic prototype for the development of residential projects inland, as well as at sea.

Living on water can mean that residents have to endure hardships such as increased moisture levels, especially in the autumn and winter. A highly air-tight structure can eliminate this problem. Advanced technology and good quality construction allows to counter nature's effects and guarantees conditions in which the resident can have a high standard of living. The floating house in Czerniakowski Port (Photo 5 top) was designed to be low-energy. It uses electrical energy as the only available energy source. Thanks to this one can minimise the costs involved in both heating and cooling the property. This is a very important aspect, as the floating house should not present an extravagant living option. It should become an ecological alternative to traditional living.

## WHAT FORM SHOULD THE FLOATING HOUSE TAKE?

The floating house design assumes a changeable location. The only continuous element is water. This means that the house should be universal enough to be assimilated into various surroundings. It should also be treated as a neutral form that can be moved from place to place. It can also be replicated [BERGDOLL, CHRISTENSEN 2008]. Such forms will be unique due to refined details used in their automated production.

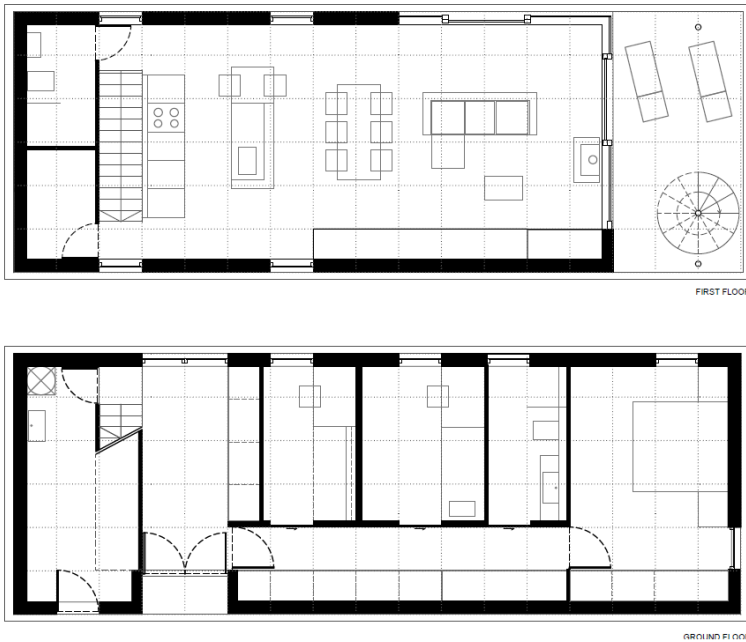


Fig. 2. Projections of the floating house in Czerniakowski Port – designed by Mai Bui Ngoc and Rafał Mazur; source: own elaboration



Photo 5. Floating house in the Czerniakowski Port, Warsaw – designed by Mai Bui Ngoc and Rafał Mazur: top – landscape context, bottom – zoom (phot. *M. Czerski*)

Many modern floating houses are similar to yachts or barges. Even more unnatural looking are houses built in a traditional form, which are then moved onto water. The most important issue when designing this type of dwelling is the creation of an object whose appearance answers to its unique function. This is akin to the Japanese way of perceiving buildings; they are characterized by their lightness (Photo 5 bottom). I am not solely referring to their weight but also their visual character. In the case of the floating house in Czerniakowski Port this task was difficult as it had to have two stories due to the size (area) limitations of the port gate. Floating houses are often one storey high, which limits them functionally. In order to create

a visually light two-storey building one has to use all the available design tools and change the way the architectural form is viewed. Japanese architect Kengo Kuma noted that Western architects view buildings as individual and distinct entities. But buildings affect their surroundings and can change them due to their heavy form KUMA [2008] writes that in traditional Japanese architecture the relation between the building and its surroundings is completely different. Buildings are “written” into the existing landscape and strive not to encroach on its composition. The Japanese method of viewing space seems to be the better option in the case of floating houses (Photo 5 bottom).

In order to achieve lightness and neutrality sheet metal was used as elevation material in the titular floating house. It was painted in matt white, which visually gave the building the lightness of paper. The sheet metal panels were divided into equal lengths thus creating a modular order. In the initial concept phase equal blocks were cut out to hold up relatively thin ceilings (Fig. 3). This was displayed as a cardboard model and gave a similar effect to what the architects later achieved.



Fig. 3. Wooden and paper models – searching for the form of the floating house; source: own elaboration

## CONCLUSIONS

The legitimacy of building or producing floating houses seems to be confirmed by many such projects, which already exist around the world. The discovery of many proto-cities throughout different historical periods also shows that the search for forms of dwelling on water is rooted in the development of mankind. The progress of urbanization, as well as climate change, show this form of dwelling in a new light. In terms of functionality, floating houses are able to fulfil similar requirements to land-based buildings. Their location additionally means that residents are able to further develop their relationship with nature, which is especially rich in places where land meets water.

The architectural form of the floating house is a fundamental design question due to its uniqueness and distinctiveness from other floating objects and land-based buildings. An attempt to define it was made when designing the floating house in Czerniakowski Port. Many design features added to the project can be viewed as the optimal solutions for a floating house. The creation of a structure, which cuts itself off from land-based construction ideals and whose form is neutral, answers better to the requirements of such a house. An important aspect seems to be the divergence from the treatment of a house as an architectural form that is apart from its surroundings. This gives direction to the design processes whose effects translate into universal buildings in terms of their location context, as well as not being dominant features in public space.

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