Landscapes of Repair: the Role of Photography and Film in Documenting the Legacy of Modern and Contemporary Architecture and Public Spaces

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Modularity and Prefabrication: Analysis of the Collective Housing at Ordrupvej No. 70 by Mogens Lassen and Engineer Ishøy

Josep Oriol Ferrer Frau

Abstract

This study examines the evolution of functionalism in Denmark through the lens of the collective housing project at Ordrupvej No. 70 (1937), a landmark work by architect Mogens Lassen (1901–1987) and engineer Ernst Ishøy (1890–1959). The analysis situates the project within the broader context of Danish functionalism, contrasting the international influences of figures such as Le Corbusier (1887–1965) and Walter Gropius (1883–1969) with the local "functional tradition" articulated by architects like Kay Fisker (1893–1965), C.F. Møller (1898–1988), and Arne Jacobsen (1902–1971).

A key focus of the inquiry is on the innovative construction techniques employed at Ordrupvej No. 70, particularly the use of a patented sliding formwork system known as *Systemhuset*. This system facilitated a rapid and cost-effective construction process and is critically analyzed in terms of its contribution to modularity and prefabrication in residential architecture. The central hypothesis is that Ordrupvej 70 represents not only a technical achievement but also a cultural negotiation between Danish tradition and international modernism, anticipating later debates on industrialized housing.

The study is further enriched by historical photographs documenting the construction process. These images capture the intermediate stages of the building's evolution, providing visual evidence of the methods and challenges associated with the implementation of the new construction system. This photographic documentation is integral to understanding the dynamic process of construction and the practical application of modular techniques in mid-20th-century Danish architecture.

Overall, the analysis highlights the contribution of Lassen and Ishøy's collaboration as one of the earliest and most coherent experiments in integrating modular construction and prefabrication into collective housing, offering new perspectives for the historiography of modern architecture in Scandinavia.

Keywords: Collective Housing; Denmark; Mogens Lassen; Modular; Concrete

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Introduction

The objective of this article is to analyze the apartment building at Ordrupvej 70 (1937), designed by architect Mogens Lassen (1901–1987) in collaboration with engineer Ernst Ishøy (1890–1959), as a paradigmatic case of modularity and prefabrication in early 20th-century Denmark. The research focuses on the collaboration between architect and engineer as a decisive factor in construction innovation, examines the building as an experiment in systematized housing production, and situates the project within the broader tensions between international functionalism and the Danish functional tradition.

The central hypothesis is that Ordrupvej 70 not only represents a technical milestone in the optimization of reinforced concrete construction, but also constitutes a cultural negotiation between Danish architectural tradition and the disruptive ideals of modernism. Its significance lies in the way it materializes one of the earliest and most coherent attempts to industrialize collective housing in Scandinavia.

The study is justified by the scarce academic attention that Ordrupvej 70 has received, despite its originality and relevance. By situating the project within the broader debates on functionalism in Denmark and highlighting the technical innovations introduced by Ishøy, this article contributes to the historiography of architecture by recovering a little-explored case. In particular, the photographs of the construction process play a central role: they not only document the experimental character of the building but also become an analytical tool that allows for a deeper understanding of the dynamics of modularity and prefabrication within the European debates on housing.

The Transition to Functionalism in Denmark

The Danish architect Mogens Lassen began his professional career in an architectural context dominated by neoclassicism and the emergence of functionalism. In the Nordic country, functionalism took two strands: the *internationale funktionalisme* (international functionalism) a movement whose leading European exponents were Le Corbusier (1887–1965) and Walter Gropius (1883–1969); and the *funktionelle tradition* (functional tradition) a term coined by architect Kay Fisker (1893–1965) and associated with the work of C.F. Møller (1898–1988), Ivar Bentsen (1876–1947), and Arne Jacobsen (1902–1971) among others. This duality has been widely studied in the historiography of Nordic modernism (Weston 1996, Østergård 2012), which situates Denmark as a country where modern architecture advanced more cautiously than in neighboring Sweden or Norway.

Attempting to explain this two-headed phenomenon, professor Nils-Ole Lund (1930–2021), in an article for the magazine *Arkitekten* titled *Funktionalismen i Danmark*, described the functional tradition as "a moderate, healthy, and sensible vision of the art of architecture" (Lund 1980, 184)

or as "a mix of local tradition with a rather superficial translation of European functionalism" (Lund 1980, 184). In contrast, international functionalism was perceived as a very disruptive and "industrial" style. In fact, in the same article, the author noted a certain reluctance and criticism from both the profession and Danish academia toward those developments emerging in other Central European territories —particularly in France and Germany—.

The architects of the Mogens Lassen generation received an eminently classical training and, although neoclassicism persisted in many major projects well into the 1930s, there was a noticeable shift in architecture in the late 1930s. Danish scepticism contrasted with the attitudes in other Nordic countries such as Sweden and Norway, where international functionalism was embraced with greater enthusiasm. In Norway, Lars Thalian Backer (1892–1930) published a manifesto in support of modern architecture in the Norwegian magazine *Byggekunst*, stating that:

> "We want to create an architecture that is in tune with the era in which we live and that is natural in relation to the material with which we build. We want to put an end to masking and accessory decoration. Function will determine form; plan and facade will be one." (Backer 1927)

Thus, he characterized neoclassical architecture as a relic of the past, unable to reflect societal transformations. This Nordic debate helps to understand the singularity of Lassen's later collaboration with Ishøy: Ordrupvej 70 embodies precisely the tension between local tradition and the radical proposals of European modernism.

In fact, if we compare the "modern" pavilion for the 1925 International Exposition of Decorative Arts in Paris with the Danish pavilion —for the same exhibition— we observe two completely different architectural styles. The Danish pavilion, designed by architect Kay Fisker, conveyed monumentality and employed symmetry as a compositional element —a neoclassical trait— whereas Le Corbusier's Esprit Nouveau pavilion was conceived as a white, dematerialized box. This represents an architectural style that stood in stark contrast to the Danish architecture.

Other signs of this reluctance toward modernity can be found in the account written by Professor Kaj Gottlob (1887–1976) after an academic trip to Germany. His comments reflected the Danish scepticism toward the new Central European architectural style. Among the most noteworthy visits were those to Heinrich Tessenow's schools in Hellerau (1911) and Klotzsche (1925) in Dresden, where they appreciated an architecture that respected tradition and aligned with their country's trends. In contrast, while touring the houses at the *Werkbund's Die Wohnung* exhibition in Stuttgart (1927), they were impressed by the use of new materials such as metal, glass, and concrete. However, this modernity ultimately failed to convince them, to the point where they questioned its formalism.

Nevertheless, it is important to note that the spread of international functionalism in the Nordic countries was gradual. Its beginning is dated to the Stockholm Exhibition of 1930, organized by Erik Gunnar Asplund (1885–1940), where the new architectural language was presented under optimal conditions: a large public attendance, positive media coverage, and a privileged location in Djurgården, by the water, on an exceptionally sunny summer day. However, a year earlier in Denmark, the Bygge og Bolig exhibition –organized in Copenhagen by the Danish Association of Architects– brought functionalism closer to the public, since society was not yet aware of what was happening in Germany and France.

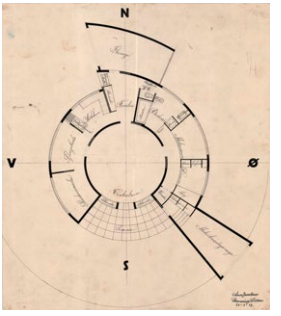
At this event, Arne Jacobsen (1902–1971) and Flemming Lassen (1902–1984), brother of Mogens Lassen, presented the House of the Future (1929), a proposal that particularly captured the visitors' attention for its radical nature. The architects designed the house as an "open machine" in the shape of a spiral, where one could live in accordance with new aspirations.

"It was a dream of free forms and technical aids that reduced labor," they said. In fact, the family model was changing and, consequently, the housing model was being questioned. Families were organized differently: both adults worked during the day, and children spent time at school. Free time became important, and as a result, the home was no longer a place of "domestic labor" but rather a venue for gathering, ritual, and communal enjoyment. For Mogens Lassen, the kitchen and the "cave" as a cozy room would be two of his main elements, thus addressing the shift in the social model posed by international functionalism.

The significance of Mogens Lassen's work in both single-family housing and multi-family residential buildings lies in his ability to employ the international style within a traditional Danish context. In fact, he is considered one of Le Corbusier's Danish disciples.

[Fig. 1]
Danish pavilion Kay Fisker

[Fig. 2]
Le Corbusier pavilion



Mogens Lassen's Training and Early Influences

To understand Lassen's architectural evolution and his relationship with engineer Ernst Ishøy, it is necessary to contextualize his education and the personal connections he established throughout his career.

From an early age, Mogens Lassen and his brother were classmates with Hans Bretton-Meyer (1902–1984) and Arne Jacobsen (1902–1971) at the Nærum Kostskole, a school that educated in "knowledge, will, and the ability to work", "the only thing that allows one to do something in the world" according to the school's 1908-09 annual guide. However, as historian Lisbet Balslev Jørgensen (1928–2002) noted in Mogens Lassen's 1989 biography, the young man never quite adapted to such a classical pedagogy. In fact, this discomfort with his studies would mark his academic journey with successive dropouts.

The Lassen brothers began their training at the Ahlefeldtsgade Technical School in 1918, where they worked as bricklayer apprentices and honed their drawing skills. During this period, Mogens became friends with Birthe, the daughter of architect Carl Petersen (1874–1923),

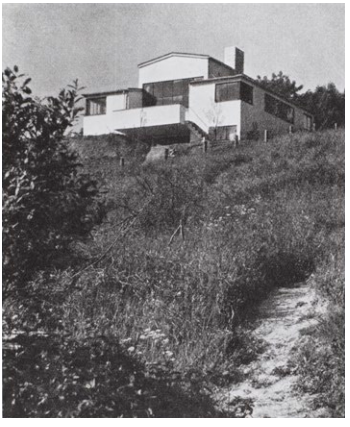
[Fig. 3-4]
House of the future

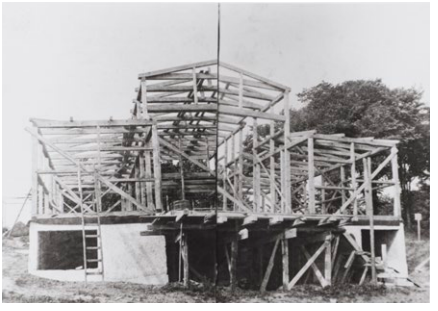
an important exponent of Danish classicism, whom they visited on multiple occasions at his residence, thereby establishing his first connections with classical architecture.

In the following years, the Lassen brothers made their first foray into architectural practice by designing a house in Randers (1920), employing traditional construction methods with masonry walls clad in wood, evoking the traditional country houses of Øresund.

In 1923, they were admitted to the School of Architecture at the Royal Academy of Fine Arts in Copenhagen, but they never completed their studies due to their inability to adapt to the academic system. However, Mogens maintained contact with the academy through his friends Arne Jacobsen and Hans Bretton-Meyer. After leaving formal education, he worked for an engineering firm, where he acquired technical knowledge.

In 1924, he joined the firm of Edvard Heiberg (1897–1958), an architect influenced by the Bauhaus school of Dessau, whose 1927 house became the origin and reference for successive functionalist-style houses. It was in this architect's library that Lassen discovered the work of Le Corbusier, sparking his interest in international functionalism. The exposure to Heiberg's practice placed Lassen in direct contact with the transnational networks of modernism, reinforcing the idea –present also in Banham (1980) and Curtis (1996)– that modern architecture was as much about technique as about aesthetics.





[Fig. 5-6]
House Edvard Heiberg. Source: Royal Danish Library

Paris. First Contact with Ernst Ishøy

After working with Heiberg, in 1925, Mogens Lassen went on to work for Tyge Hvass (1885–1963), who himself built a "modern" house at Tuborgvej 99 in Hellerup. Hvass, aware of the importance of visiting Le Corbusier's modern works as a reference for European functionalism, facilitated and helped organize Lassen's stay in Paris between 1927 and 1928. There, the young architect worked as a draftsman for the Danish construction firm Christiani & Nielsen, designing railway terminals alongside a team of engineers, a task he found frustrating. In letters from that period to his friends Hans Bretton-Meyer and Ole Wanscher at the time, he expressed his surprise at the idea that engineers could be involved in architecture. However, he was also positively impressed by the precision of their structural calculations and their control over construction processes –especially the technical aspects–.

In Paris, Lassen explored the entirety of Le Corbusier's works, even though at that time the architect had few constructions in the city. In France, Lassen deepened his architectural knowledge derived from the Dom-ino system (1914) and the Maison Citrohan (1920), as well as delving into the image of the modern, functional house that Le Corbusier presented in the *Pavillon de l'Esprit Nouveau* (1925).

This period is also significant because it is there that he met Danish engineers Chresten Ostenfeld (1900–1976) and Ernst Ishøy (1890–1959), with the latter becoming an intense future collaborator. The relationship between the two was especially fruitful, as both shared an enthusiasm for the new modern architecture. Lassen was drawn to its aesthetics and freedom, while Ishøy was interested in optimizing new materials and exploring their potential to improve structures.

Upon his return to Denmark, skepticism toward functionalism began to dissipate. Neither the magazine *Arkitekten* nor the anti-formalist *Kritisk Revy* voiced criticisms of Le Corbusier. Even at the 1927 Stuttgart Exhibition, Danish architect Kaj Gottlob presented a pavilion titled Esprit Nouveau, symbolizing the transition to modernity. This context allowed Lassen to develop his professional career, consolidating his approach within the principles of international functionalism alongside Ernst Ishøy.

Projects Prior to the Systemhuset

The idea behind functionalism was to harness new techniques and materials to develop an aesthetic that aligned with a new way of life. Mogens Lassen, influenced by the publication *L'Architectural Vivant*, incorporated architectural solutions inspired by the work of Le Corbusier, but with a more intimate approach tailored to the Danish context.

The collaboration between Mogens Lassen and Ernst Ishøy began in 1934 with the design of a single-family house for Dr. Eggert Møller (1893–1996) and his wife Irmeli, daughter of composer Carl Nielsen. They were clients with a high cultural level who were committed to constructing a truly modern home that was different from the conventional designs of the time. The house, built in 1934 on Bakkedal 7 in Hellerup, was conceived as a white cube. It was constructed with reinforced concrete, using a formwork made of wooden boards arranged horizontally, which gave the facade a distinctive patina. However, the complexity and slowness of this process led them to seek a more efficient system.

Ernst Ishøy had been working on the development of a sliding formwork system that would allow construction to be accelerated. This system was not implemented until the construction of the house at Anchersvej 6 (1935) in Klampenborg. Ishøy explained his innovation in an article published in Arkitekten in 1937, entitled Systemhuset:

"Several years ago, I began working on the idea of developing methods to construct reinforced concrete buildings, especially multi-storey residential ones, in a more economical and faster way. I was clear that the great irregularity in design and, therefore, in construction, was the main reason why concrete houses always ended up being more expensive than brick ones." (Ishøy 1937, 173)

During the construction of the house at Anchersvej 6, a sliding formwork made of steel plates was tested for the first time, designed to reduce construction times, improve quality control, and lower costs. For this to be possible, close cooperation between architect and engineer was essential. According to Ishøy: "The task of constructing more economical reinforced concrete houses can be divided into two parts: first, the design of the house and then its execution." (Ishøy 1937, 173).

In the following years, the Systemhuset continued to be refined in other projects, such as the residences at Solystvej 5 and 7 (1936) in Copenhagen. Finally, in 1937, Mogens Lassen built the apartment building at Ordrupvej 70, also known as "the hive", consolidating the application of these innovations in architecture.






[Fig. 7–12]
Images documenting the construction process of the house Anchersvej 6. Source: Royal Danish Library.

The Ordrupvej 70 Apartment Building

The importance of the apartment building of Ordrupvej 70 lies in its definition of a simple and efficient structure. Its design is based on a succession of reinforced concrete panels arranged along the longitudinal axis of the site, which subtly reveal themselves on the facade, and establish the "system" that defines all other elements of the building —facade and internal divisions—. Acting as the generating element.

The structure, and therefore the project, is the result of a close collaboration between architect Mogens Lassen and engineer Ernst Ishøy, who conceived the building through a meticulous construction approach, planning each stage of its execution. The objective was for all structural elements —load-bearing walls and slabs— to have the same thickness. Thanks to this uniformity, they could be formworked simultaneously, generating a monolithic structure that freed the facade from any load-bearing functions.

The dimensional control of the spans between the load-bearing walls was crucial —approximately 4.15 meters—. The precision in the structural calculations was such that the building, designed by Lassen and Ishøy, was constructed with concrete panels of 15 and 12 centimeters thick, as were the slabs. This gave the ensemble a sense of slenderness, particularly evident in period photographs where the contrast between this modern architecture and the surrounding traditional buildings is striking, thereby emphasizing the change in style.

[Fig. 13]
Front view of the Ordrupvej 70 building. Source: Royal Danish Library.

For the construction of the load-bearing walls, the steel sliding formwork system known as Systemhuset, patented by Ernst Ishøy, was used. According to the engineer, "The quality of work with steel formworks is superior to that obtained with wooden formworks." (Ishøy 1937, 174)

This system surpassed the one previously employed in the project for a house at Bakkedal 7 in Hellerup. The new system represented a significant advancement by allowing the construction of one floor every four days. As a result, the process was 10% more economical than traditional construction and, in theory, the taller the building, the more cost-effective the method would be.

In addition to reducing costs and time, the system also optimized the use of built space. Unlike traditional brick structures, which required thicker walls at the lower levels, reinforced concrete allowed for a consistent section throughout the vertical span.

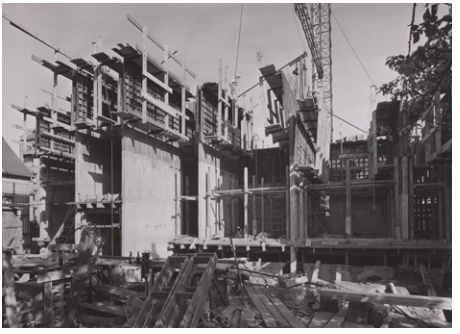
This innovation situates Ordrupvej 70 within the broader European discourse of industrialized housing. Comparable experiments were taking place in Germany and the Netherlands (Curtis 1996), but the Danish example is distinctive for the intensity of the architect-engineer collaboration and the adaptation to local tradition.

The industrialization of this process involved the introduction of machinery in construction, which represented a true revolution in the sector. Although the press of the time welcomed this innovation with enthusiasm, it also expressed concern over a possible reduction in the workforce. However, Ishøy commented in his article that "it was possible to increase the speed of execution, as the system allowed for twice as many workers to be employed," (Ishøy 1937, 174) thereby dispelling this concern.

Once the structure was built, one of the most significant technical challenges of the project was the longitudinal facades. To solve these, an industrialized solution in line with dry construction was used: prefabricated wooden frames incorporating windows and opaque panels. These elements not only reinforced the modern aesthetic of the ensemble but also met the thermal and acoustic requirements.

[Fig. 14-15]
Photo of the house worker. Source: Royal Danish Library.

[Fig. 16-19]
Images documenting the construction process of the building Ordrupvej 70.

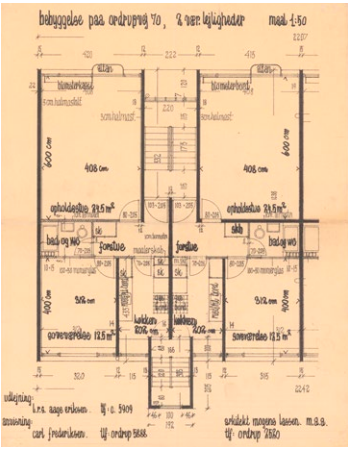


As for the balconies, they were not conceived merely as functional elements, like the kitchen staircase recommended by firefighters, but as an extension of the living room, allowing them to be enjoyed when weather conditions were favourable. Moreover, the inclusion of a sliding door along the width of the balcony optimized the use of interior space.

From a design perspective, this articulation of structure, façade, and balcony reveals an understanding of modern housing that goes beyond technical efficiency. Lassen and Ishøy's project anticipates debates on flexibility, rationalization, and the "dwelling machine", situating Ordrupvej 70 in dialogue with Le Corbusier's theories while grounding them in a Danish context (Frampton 2020).

Mogens Lassen was able to organize the project around the architectural conception that Auguste Perret presented in Contribution à une Théorie de l'Architecture (1952). Perret formulated a series of aphorisms in which he equated truth with beauty, truth with structural clarity, and truth with proportion. One of his fundamental principles was: "L'architecture est l'art d'organiser l'espace. C'est par la construction qu'il s'exprime." (Perret 1952, 29). And thus, he approached the project alongside engineer Ernst Ishøy. For both men, artistic expression was just as important as the technical and social aspects of the building, and Ordrupvej 70 addressed both.

This interpretation reinforces the contribution of the project: Ordrupvej 70 embodies the balance between technical innovation and architectural meaning, showing how prefabrication could serve not only as an economic tool but also as a generator of new spatial and social models of housing.



[Fig. 20-21]
Front Elevation and Floor Plan ofof the building Ordrupvej 70.

Final considerations

The residential building at Ordrupvej, designed by architect Mogens Lassen and built in 1937, represents a milestone in the application of the construction system developed by engineer Ishøy. Its innovative use of reinforced concrete and its structure with transverse load-bearing walls allowed not only greater flexibility in facade design but also an optimization of construction processes, reducing both time and costs compared to traditional brick buildings.

The integration of large windows and sliding doors reflects a modern approach to residential architecture, improving interior lighting and ventilation. Additionally, the use of materials such as cork and stainless steel shows an interest in thermal efficiency and durability.

The aim of Systemhuset was to offer a rapid and economical construction method. Although the building at Ordrupvej 70 generated great expectations, it did not lead to further developments and remained an isolated case. Unfortunately, the other projects never materialized and remained only on paper.

Nevertheless, the scientific contribution of this project lies in three main aspects: it demonstrates the potential of reinforced concrete to systematize housing construction through modular repetition; it highlights the importance of the architect–engineer collaboration as a generator of technical and aesthetic innovation; and it shows how Danish architecture negotiated between tradition and international modernism, making Ordrupvej 70 a cultural as well as a technical milestone.

In this sense, the article contributes to the historiography of modern architecture by reframing Ordrupvej 70 as a case that anticipated later industrialized housing systems in Europe, while also evidencing the limits of innovation in the Danish context of the 1930s. The hypothesis proposed at the beginning –that Ordrupvej 70 embodies both a technical milestone and a cultural negotiation– is confirmed through the detailed analysis of its design, construction process, and reception.

Thus, beyond being an isolated experiment, the building constitutes a reference point for current debates on prefabrication and sustainability, since it reveals how early 20th-century architects and engineers already grappled with issues of speed, cost, efficiency, and liveability that remain central today (Frampton 2020).

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