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Exploring the Dutch *Bruynzeel Kitchen* Through the Negotiations of Its Two Designers, Limperg and Zwart

Selin Geerinckx, Els De Vos

University of Antwerp
Belgium

Abstract

During the interwar period, numerous endeavours were made to develop a rational kitchen, also called a laboratory kitchen, namely one that prioritised labour-saving efficiency through thoughtful layout and design. Catherine Beecher's work is often credited as its starting point. By synthesising household reformers' experiences and architects' design expertise, scholars have extensively examined how rational kitchens evolved. This paper discusses the conception of the standardised Dutch Bruynzeel Kitchen *(1938) by the collaborative efforts of two designers with distinct yet complementary interior design profiles. Renowned Dutch designer Piet Zwart, widely recognised for his contributions, finalised the technical drawings and promotional materials for this iconic kitchen. Less acknowledged is the early involvement of Dutch architect Koen Limperg, son of a business economics professor, who drew the preliminary designs. Interestingly, this kitchen design was developed while body culture emerged in the Netherlands. Complementing already existing research from art history, anthropology, the history of technology, and gender studies, this paper, based on literature and archive research, investigates through an interior design lens how both designers integrated their respective practices and expertise into the* Bruynzeel Kitchen*'s design, incorporating elements of physical activities (dance, gym, sports) and household economics.*

Keywords: rational kitchen, home economics, ergonomics, scenography, physical activity

Correspondence Address: Selin Geerinckx, University of Antwerp, Stadscampus, Mutsaardstraat 31, 2000 Antwerp, Belgium. Email: selin.geerinckx@uantwerpen.be

Introduction

Interwar modernism in Europe is characterised by a social utopian belief that modernity can improve society. Household reformers wanted to emancipate and free the people from domestic drudgery and bourgeois models. Modernist social housing and domestic comfort were seen as a way to reach this. In this regard, the rational kitchen, or laboratory kitchen, was the engine of modernity. The iconic *Frankfurt Kitchen* (1925–1926), designed by Margarete Schütte Lihotzky, who was a disciple of the American home economist Christine Frederick (Freeman, 2004), was presented at *Congrès Internationaux d'Architecture Moderne II* (CIAM II) in 1929 (Henderson, 1996). This kitchen was the showpiece of experiments to rationalise the household with a labour-saving layout and ergonomics while at the same time providing aesthetics through a modernist appearance. A year later, the Belgian architect Louis H. De Koninck presented at CIAM III in Brussels his well-received modular *CUBEX* kitchen, inspired by the *Frankfurt Kitchen*. A highly flexible, industrially produced kitchen, it became a success in Belgium and its surrounding countries, at least among the middle class (Ruegg, 1998). In the Netherlands, there was also an interest in the kitchen, but because it was quite expensive, alternatives were sought for a functional kitchen that was also affordable for the lower classes. In 1938, the Dutch Bruynzeel factory, situated in Zaandam (just above Amsterdam), introduced its legendary *Bruynzeel Kitchen* (Figure 1) to the Dutch market.

Numerous studies have shown that rational kitchens came about through a combination of the user experiences of household reformers and the design knowledge of architects, e.g., the kitchen of George Muche and Adolf Meyer's in *Haus am Horn* presented as a design suitable for mass production during the first Weimar *Bauhaus-ausstellung* (1923), Lihotzky's *Frankfurt Kitchen* (1926), the workers' house kitchen by the Dutch architect Jacobus Johannes Pieter Oud together with household expert Erna Meyer for the *Stuttgart Weissenhofsiedlung* (1927), J. W. Janzen's *Holland Kitchen* (1929), and the *All Electric Kitchen* of Arthur Leslie Osborne displayed at the *British Ideal Home Exhibition* (1934). Also, in the design of the iconic *Bruynzeel Kitchen* (1938) ascribed to designer Piet Zwart, there was an interplay of the knowledge of architects, household reformers, and furniture designers. Archival material indicates that besides Zwart, architect Koen Limperg who worked together with Ir. Meijers and Mrs. Lotgering Hillebrand of the Amsterdam New Housekeeping School, was also involved in developing Bruynzeel's first standardised kitchen. Preliminary designs in Limperg's hand drawing were found in the archive at The Nieuwe Instituut in Rotterdam.

Figure 1
The *Bruynzeel Kitchen* displayed in a customer brochure (Image from Nieuwe Instituut/MEIJ, d7)

On the one hand, this paper aims to document the design process of the *Bruynzeel Kitchen* and the specific approach and negotiations of the two designers with different profiles in detail. On the other hand, it wants to approach the design of that kitchen from the perspective of interior design. So far, kitchens have been mainly studied from the disciplines of art history, the history of technology, anthropology, and gender studies, but this paper proposes an extra perspective of the *Bruynzeel Kitchen* based on the design process. This is done through literature, archive research, and the analysis of the kitchen plans and promotional brochures. This paper shows how each designer took care of certain aspects of the kitchen design and has a slightly different profile as designer. Conversely, this in-depth study clearly demonstrates a design approach from an interior design theoretical framework that focuses on the bodily and mental relationship of the human body to the surrounding objects and space (e.g., circulation patterns based on daily and weekly household chores, the use and the spatial and internal organisation of the kitchen cabinets, the relationship between indoors and outdoors, spatial experience and scenography, and ergonomics), combined with aspects of industrial design (e.g., the functional use of kitchen furniture and utensils for specific food preparation).

Home Economics During the 1930s
Developments in the Netherlands

The Great Depression in the 1930s created scarcity in Europe, affecting the daily living of all classes of Dutch households under its conservative government. The government put unemployed men to work in camps for cultivating land in large-scale public works, e.g., the *Bosch Plan*. This had to stimulate the economy within the framework of the Dutch *Plan van de Arbeid* (Labour Plan). The radio, as a democratic

medium, was also used to provide popular elevation and physical education.[1] For the women at home, instead of increasing the daily budget for food and hygiene purposes, the government supported socio-cultural intermediary organisations financially to provide large-scale education and training on household matters. On the one hand, housekeeping schools could offer training in modern housekeeping to young, unemployed, or poor women so that they could then offer their services to upper-class households seeking help. On the other hand, the governmental women's organisations at the national and regional levels provided domestic advice through periodicals, radio lectures, field trips, and workshops across the country to middle-class housewives who took care of their household. This set-up was logical because there were many more housewives in the Netherlands than in neighbouring countries. For example, proportionally, more Belgian women were forced to work outside the home after being widowed during the Great War.

One of the main topics addressed in the literature on the so-called new housekeeping was the modern kitchen interior. The increasing availability of electric appliances made housekeeping a less time-consuming job, but their good use required extra training. Moreover, these developments led to new cooking methods and new dishes. However, these electrical products remained too expensive for the poor. Also, housewives from different cultures, e.g., Sefardic, Ashkenazic and assimilated Jewish women, had to be taught affordable housekeeping in line with their religion and financial means.[2] Kosher cooking, ritual cleaning, and religious holidays that

[1] The first-morning gym was broadcast in 1931 on progressive workers' radio station VARA formed by the *Vereeniging van Arbeiders Radio Amateurs* (V.A.R.A.), instructed by Gerrit Kleerekoper, the former coach of the women's gymnastics team that won at the Amsterdam Olympics (1928). During his radio gym class, which the institution allowed to be broadcast only shortly, the Amsterdam-based Jewish instructor gave body training to both men and women. This initiative was resumed circa 1936 by the Christian radio *Nederlandse Christelijke Radio Vereniging* (NCRV) with the male instructor G. Burgwal from Hilversum.

[2] This initiative was taken primarily by the Jewish Women's Council, a self-help organisation represented in Amsterdam, Rotterdam, Utrecht, and The Hague, which consisted mainly of members from well-to-do families of great prestige, academically educated, and initially with great ambitions. With the large number of refugees and the growing financial problems for the Jewish proletariat in the cities and the countryside, for example in Amsterdam most were poor due to the imposed restrictions in ways of earning money, the council wanted to mobilise their solidarity broadly. In this regard, the "bottleneck of Jewish housekeeping was mainly in cooking," which became visible "in the housekeeping schools of Rotterdam, The Hague and Amsterdam that seemed to lack the facilities that met the strict rabbinic requirements of ritual cooking" (de la Bruhèze, 2001, p. 68–69).

involved specialised housework such as separate food preparation and associated spatial circulation paths embodied Jewish identity. Because of socio-economic and cultural differences, there was a need not only for affordable but also for modular kitchens that could be spatially adapted to each household's lifestyle. Dutch home economics, housewives, architects, and manufacturers looked abroad where there were similar conditions. Ideas about rationalisation of the household from the US to improve physical health met the modernist aesthetics in Europe.[3] These led to a series of rational or laboratory kitchens of which the aforementioned *Frankfurt Kitchen* (1926) was the first and most influential. The *Bruynzeel Kitchen* in the Netherlands, whose genesis we will now outline, was also one of these.

It was the Dutch architect Koen Limperg (1908–1943), together with his associate Ir. Gerard Johan Meijers (1882–1945) who took the initiative to engage in a kitchen production line on a larger scale to make it affordable. They founded an architecture office in Amsterdam at the beginning of the 1930s. Meijers, of wealthy Jewish descent, was an engineering architect and the brother of law professor Eduard Mauritz Meijers. The much younger Limperg graduated in civil building engineering and was the son of Professor Théodore Limperg, an acclaimed professor in social and business economics. As of 1927, he occupied a key position within *Nederlands Instituut Voor Efficiency* (NIVE) [The Dutch Institute for Efficiency]. Under his efforts, the NIVE established in 1931 a separate family household study group. In this context, the NIVE invited French specialist in home economics Paulette Bernège for an introductory lecture at the *Efficiency Days* in Amsterdam ("Efficiency-dagen," 1930). She spoke on the social significance of household efficiency. The lecture received considerable coverage in various Dutch newspapers. Théodore Limperg would involve his son Koen in the efficient construction of worker's houses (Houkes, 2020).

To set up a kitchen production, Koen Limperg looked at Belgium, where E. J. van de Ven in Brussels produced and distributed the *CUBEX* kitchen (Figure 2) designed by Louis Herman De Koninck (Van Caudenberg & Heynen, 2004). Its 60 x 60 cm cabinets were interesting because of their modularity and flexibility. The system is applicable for small, medium, and large kitchens and adaptable to each household's cooking needs of different cultures. Placing the cabinets against each

[3] We refer to the developments in scientific management or Taylorisation in the domestic sphere as promoted by Christine Frederick. These were later complemented psychologist and DEng Lilian Gilbreth who focused on the psychological dimension within scientific management and the effects of motion in relation to time.

other already had the advantage of making the kitchen extremely flexible. Still, it meant a high material cost due to the double sides of the cabinets against each other.

Figure 2
The *CUBEX* kitchen by Louis Herman de Koninck (Image from *Kitchens*, 1935)

Negotiations with Bruynzeel

At the end of 1935, Limperg informed De Koninck that he would receive a copy of his recently published book *Keukens* (Kitchens). The book includes the *CUBEX* kitchen and was reviewed in several publications in the Netherlands and abroad.[4] Limperg added that the time is right to start the mass production of standardised kitchen cabinets in the Netherlands.[5] But to avoid misunderstandings, Limperg proposed to formalise first the financial and legal terms they had discussed at their meeting this past summer. De Koninck replied that if the Dutch manufacturer agreed with the conditions, De Koninck would deliver his knowledge to enable production. However, in the case of the acquisition of the name *CUBEX*, Limperg must consult the manufacturer E. Van de Ven as the name is patented and owned by them for the commercialisation of De Koninck's design.

[4] Besides promoting their publication in Belgium, the Dutch periodicals *'t Binnenhuis*, *Groep 8 en Opbouw*, and two Polish periodicals reviewed this book.

[5] The principle of standardisation involves, on the one hand, setting and conforming standards for a product or service so that the quality can be verified. This means that differences are streamlined into the standard or norm. Thus, standardisation allows for large-scale production and delivery. However, this also holds the risk that reducing differences may also reduce diversity.

During this letter correspondence with De Koninck, Limperg was already in contact with Bruynzeel, a flourishing Dutch carpentry factory in wooden doors with whom he wanted to start the production.[6] In fact, Limperg acted as a mediator between Bruynzeel and De Koninck to negotiate the price setting and conditions. The discussions ended quickly because De Koninck proposed a commission per sold kitchen to be paid to the design owner, CIAM Belgium, to cover the copyrights. Bruynzeel only wanted to pay one fixed amount to cover all preparation costs because the expected competition would not generate a sufficient profit margin to allow a commission-based agreement. Limperg responded to Bruynzeel with a proposal to cover copyright fees, provided that the CIAM would abandon the commission, as Limperg hoped for a positive outcome. Bruynzeel had expressed that, in case they start up a kitchen production, they were convinced that Limperg and Meijers were the only consultants in the Netherlands that Bruynzeel should involve in this fabrication. De Koninck only wanted to reduce the commission rate from 5% to 3%. Nevertheless, Bruynzeel returned with a one-time fee of 10,000 Belgian francs as a counterproposal. Finally, a consensus on remuneration could not be reached. De Koninck declined further negotiations because he felt Bruynzeel's sum was irresponsible and was convinced the idea was worth something. In addition, Belgian CIAM member Victor Bourgeois supported De Koninck to break off the negotiations.

CIAM Belgium wanted to remain completely independent in the exploitation of its kitchen in the Netherlands or other countries. So, they clearly stated that they did not wish to be associated with Limperg's current negotiations for standardised cabinets to be manufactured in the Netherlands. Yet, De Koninck mentioned in his previous letter to Limperg to be in contact with the Dutch company Cel Triplex through a Belgian agent to explore further possibilities. Limperg and his associate partner Meijers accepted the decision. They continued independently with the Dutch manufacturer, who wanted to expand the range of the standardised kitchen cabinets with additional kitchen finishing, e.g., sinks and countertops, in cooperation with other Dutch companies, to offer a complete kitchen set from a catalogue. Limperg also informed De Koninck that he

[6] It is possible that Limperg and his associate Meijers turned to Bruynzeel specifically because their co-editor of *Kitchens*, Riek Lotgering-Hillebrand, already mentioned this factory as a reference for wooden doors in her publication *De Nieuwe Huishouding* [The New Housekeeping] released in 1931. This was the Dutch translation of Erna Meyer's *Der Neue Haushalt* [The New Housekeeping] but based on the needs of Dutch housewives.

would report this evolution to Cornelis van Eesteren, chair of the Dutch CIAM.

The Pre-Studies and Preliminary Design Sketches of the *Bruynzeel Kitchen*

An experimental kitchen proposed by Limperg and Meijers

The Great Depression in the Limperg and Meijers wanted to design a standardised, production-ready kitchen for manufacturer Bruynzeel to be launched one year after signing the contract. The contractual two-phased design process started in May 1936 and was finished by the end of the summer as the contractual assignments had been completed. We draw this conclusion based on the two contractually agreed payments Limperg received from Bruynzeel and the letter communication that became less frequent, apart from a few minor additions regarding finishing technical gadgets.

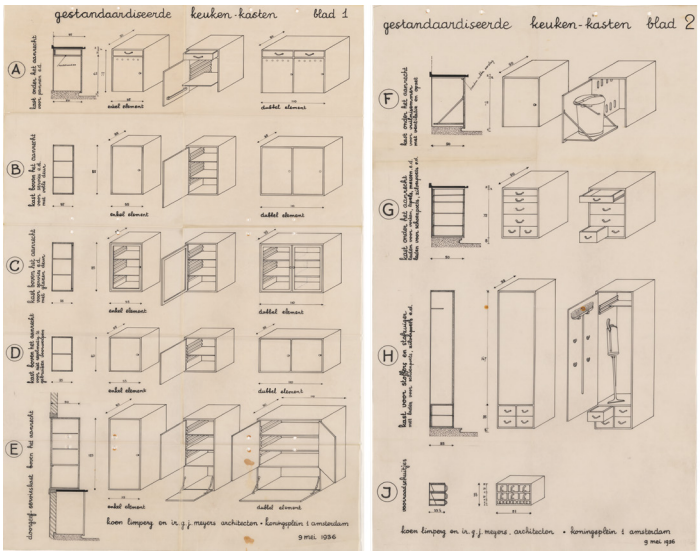

Figure 3
Two-page drawing with cabinets by Limperg and Meijers in 1936 (Images from Nieuwe Instituut/ LIMP, 34)

Limperg appealed to his contacts to organise for Bruynzeel right at the beginning of the commission a London study trip to gain knowledge about 'standard' kitchen elements. It included a visit to the Good Housekeeping Institute and an interview with the designer of the *All Electric Kitchen*. Limperg's archive already contains drawings made on 9 May 1936, consisting of a two-page list with various kitchen cabinets with corresponding dimensions and four detailed drawings for construction as contractually agreed. The list (Figure 3) illustrates the specific use of the cabinet by how the utensils are distributed among the cabinet elements. The graphic layout demonstrates similarities with the *CUBEX* kitchen, explaining the small sum that

Limperg voluntarily paid to CIAM. However, the cabinets do not have the 60 x 60 cm dimension. This is confirmed by Roding (1981), who relates Limperg's unit size to the *Holland Kitchen* of J. W. Janzen in 1929. This statement had also previously been endorsed by Janzen himself, who described the *Bruynzeel Kitchen* as "a slight variation on the *Holland Kitchen*'s unit size" (Janzen, 1943 p. 128). Roding continued her reasoning by calculating that "the smallest size of the basic cabinet element was probably derived from the space required for a large dinner plate, also common for an average cooking pot" (Roding, 1981, p. 15).

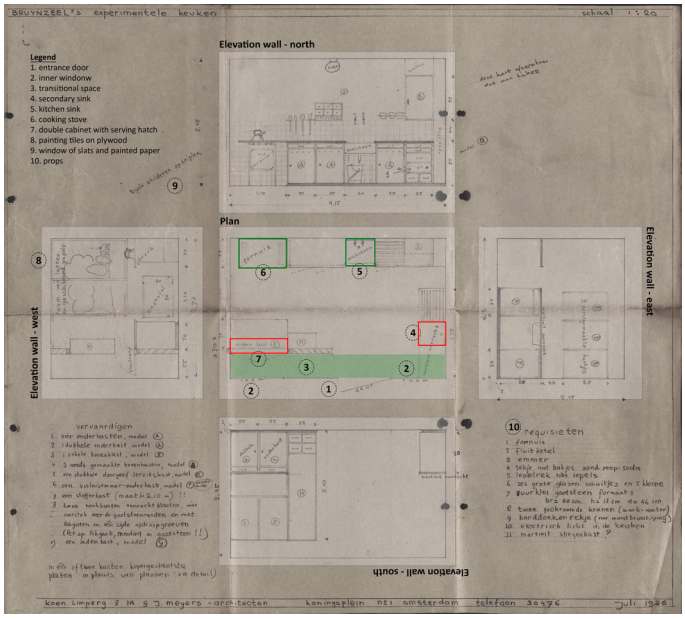

Figure 4
Limperg and Meijer's plan and elevations of the *Bruynzeel*'s *Experimental Kitchen* on chalk paper, July 1936 (Image from Nieuwe Instituut/LIMP, 35.2; annotations by authors)

In a document to Bruynzeel in January 1936, Limperg[7] and Meijers motivate the need for kitchen cabinets designed by a well-thought system based on form and dimensions that combines both the possibility of effective use in the Dutch household and the building technology practice.[8] The designers propose two to three different cabinet units that allow freedom for all conceivable variations in arrangement, depending on the size of the kitchen space or the personal wishes of the cabinet users or those who furnish the kitchen'

[7] Koen Limperg signed the document as a member of *Groep 8*, a Dutch association of architects.

[8] For example, in the cabinet study by Koen Limperg and Gerard Johan Meijers, which builds on the knowledge Limperg had gained at the *Ideal Home Exhibition* (UK), they explore solutions for solid cabinet structures with interior shelves but at the same time practical for housewives by using round inner corners to prevent dust accumulation.

(Nieuwe Instituut/LIMP 35.1). They suggest three cabinet types as a base that can be arranged in different ways. This range can then be extended to other cabinets in the home for clothing, the dining room, bedroom, etc.

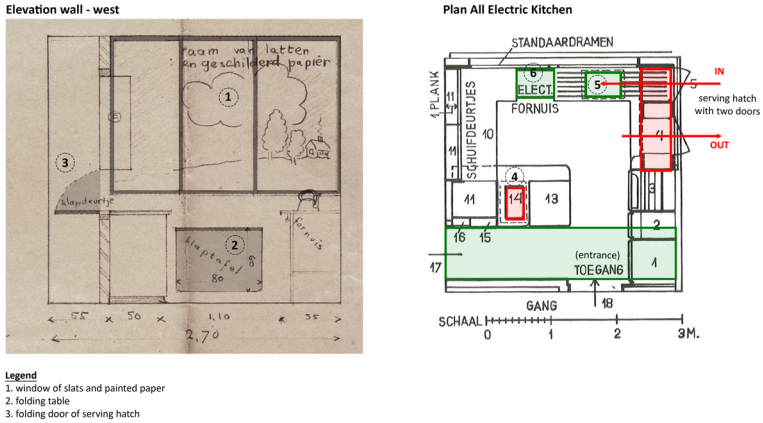

Figure 5
Elevation of the western wall with a *trompe l'oeil* (left) (Image from *Kitchens*, 1935); a plan layout comparison between the *All Electric Kitchen* and Figure 4 (right) (Image by Nieuwe Instituut/LIMP, 35.2, annotations by authors)

In the second phase of the contract, Limperg and his associate drew a kitchen layout named *Bruynzeel's Experimental Kitchen* (Figure 4). It consists of a floor plan and corresponding elevations in unfolded view, added with the overview of the cabinets organised in the space and a list of utensils, which Limperg designates with the term *rekwisieten* (props). This term is not typical for home economics but is often used in the theatre world. The Cambridge Dictionary (2024) explains that the term 'props' refers to small objects used by actors during the performance of a play or in a film. This shows how Limperg implemented 'jargon' from the theatre into his drawings.

In Limperg's spatial organisation, we notice a modular organisation by means of three 'workstations' to support the following household tasks: cleaning, cooking, and serving. In comparison with the British *All Electric Kitchen* (Figure 5, right), a design by the British architect Arthur Leslie Osborne and the Dutch household expert Mrs. A. M. Versteegh, we notice that the cooking stove and the sink are in the same location. Only the secondary sink for the household chores and the serving hatch with a view to the home interior through the left inner window (to watch the children) are interchanged. The latter is integrated into a partition wall that divides the kitchen into two unequal parts, an in-between or transitional space, which visually disconnects the larger part with the real inner windows and entrance door in the middle. Overall, it is a spacious room. The British design was intended for a household with one servant who could have her own sitting room in the home. Here, we also see a parallel

with Limperg's design. In *Kitchens*, Limperg advises that the kitchen table—only recommended for larger kitchens—is not for kitchen work but only meant for the servant to eat and to take care of her personal stuff after her household work is finished (Limperg et al., 1935). Fascinating is that, above the table, we see in the western wall elevation (Figure 5, left) an indication of a 'window' as a scenographic proposal. It consists of a frame in wooden slats filled with painted paper, providing the servant with an outside perspective of the countryside to compensate for the absence of a window. It seems to advise painting a landscape view, *a trompe l'oeil*, as in a decor. It shows how Limperg had a spatial view of his kitchen and gave importance to the relation with other rooms, including the outside. By the same token, Limperg recommends in the plan layout to "paint kitchen tiles on the plywood" that is fixed to the kitchen walls as indicated in the northern wall elevation (Nieuwe Instituut/LIMP, 35.2).

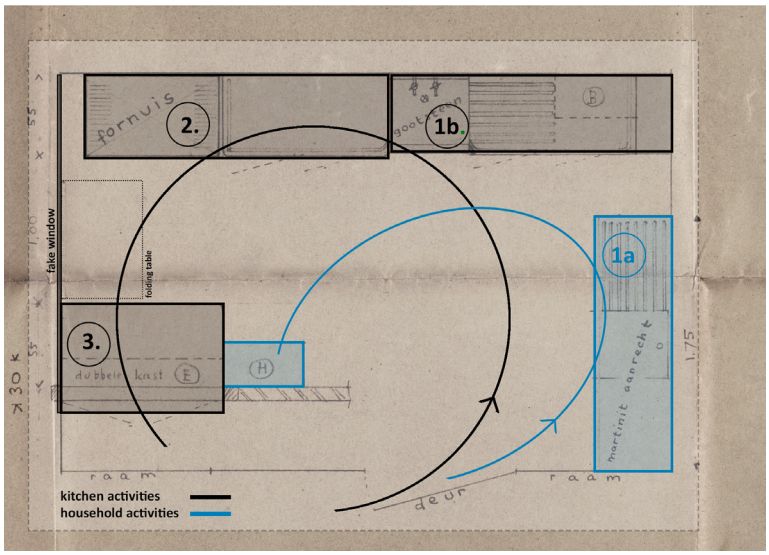

Figure 6
Arrangement of the kitchen space: 1) cleaning of 1a) home, 2b) kitchen ware; 2) cooking; 3) serving (Image from Nieuwe Instituut/LIMP, 35.2; annotations by authors)

Roding was the only one to interpret Limperg's kitchen design for Bruynzeel as early as 1981. According to her, Limperg applied the theory of the 'continuing working space' by the American educator Catherine Beecher, who already propagated in 1841 the need for daily body workouts in women's education (Beecher, 1841). Indeed, this concept promoted a division of household tasks. In the case of Beecher's theory, it involves the sequence of storing-preserving, cleaning, and preparing. These are reflected in Limperg's floor plan division but in counterclockwise order. She finds this direction logical, "at least for right-handed users" (Roding 1981, p. 15). Moreover, it confirms Limperg's strong spatial, even architectural focus. Roding

rightly distinguishes clustered household tasks in specific areas of the kitchen. However, our comparison with the *All Electric Kitchen* shows that Limperg's design contains a slightly different household task division than Beecher's (Figure 6). Closest to the entrance door is the cleaning area, then comes the cooking station, and finally, the preparing area. It is parallel readable per elevation, except the preparation and housekeeping tools are arranged on the same elevation. Another possibility is that the elevation on the right side allows a separate station to allow ritual cooking. However, Roding did not mention the imitation window that Limperg designed. This seems to be element he learned from his scenographic commissions.

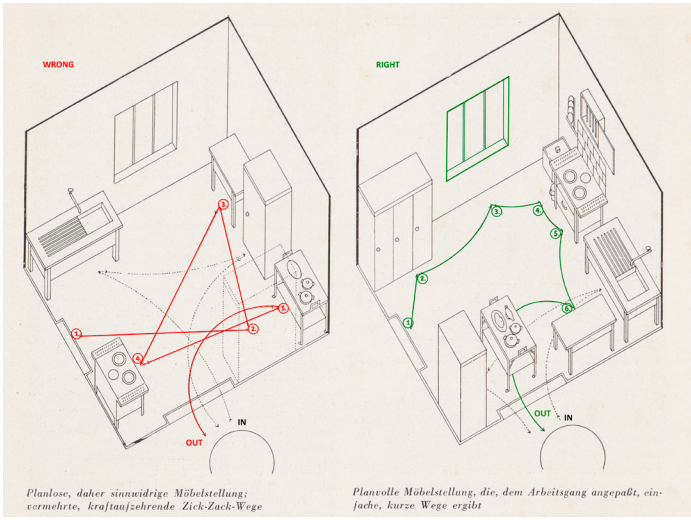

Figure 7
Bad practice (left) and good practice (right) of arranging the tasks in the kitchen interior, discussed in *Grafische Berufsschule* (Vocational School for Graphic Design), January 1931 (Image from Nieuwe Instituut/ZWAR, 209; annotations by authors)

In the counterclockwise arrangement, we trace parallels to Erna Meyer's spatial organisation of the kitchen as displayed in her article *München: Die Kuche der Zukunft* (Figure 7, right). Here, physical activity takes place in a similar way. The tasks are ordered in the pattern of a circle as opposed to the unregulated placement of kitchen elements (Figure 7, left) resulting in inefficient body movement across the interior.

A standardised kitchen design and promotional presentations by Zwart

Records show that Piet Zwart became involved in the design of the *Bruynzeel Kitchen* at a later stage by the fall of 1936. However, we do not find preliminary designs of the kitchen in the same preparatory phases as was the case with the sailboat, for example, which supports our hypothesis that he came later in the process and was able to continue working on Limperg's designs. For the *Bruynzeel Kitchen* design, the main contribution of Zwart seemed to be the analysis

of specific cooking tasks in order to design the organisation of the kitchen cabinets and the layout of the cabinet's interiors (Figure 8 and Figure 9). While designing the sailboat, he experienced how important good detailing was in his design.

Figure 8
Pages from a Bruynzeel folder explaining various smaller handy tools such as: 1) handy *opzetkastjes* (elements to attach) for ironing; 2) extendable *werklade* (work drawer); 3) the removable *werktafel* (work table) (Image from Nieuwe Instituut/MEIJ, d7; annotations by authors)

Figure 9
The *Bruynzeel Kitchen* is displayed in a folder explanation by text and images on the merits of the use (Image from Nieuwe Instituut/MEIJ, 35.3)

One of the first *Bruynzeel Kitchen* brochures (Figure 9) explains that the potential customer can choose from three types of kitchen elements that, as blocks, can be selected and assembled. These types consisted of countertop elements, wall elements, and standing cabinets. For each type, there are again a few options at the quantity and drawer

distribution level. Such a modular system allows anyone to compose a kitchen regardless of the type of floor plan, size of the kitchen interior, and according to individual needs. However, it is explained in the catalogue that, in order to put together a modern and efficient kitchen, the necessary arrangement of the elements in relation to each other must be taken into account. That is why Bruynzeel's kitchen consulting service offers the opportunity to design a practical kitchen and solve problems for the customer. This catalogue also contains pre-scripted kitchen plans based on housekeeping tasks according to a predetermined daily and weekly schedule, providing a kitchen in linear compositions to operate and to serve quickly and efficiently (Figure 10).

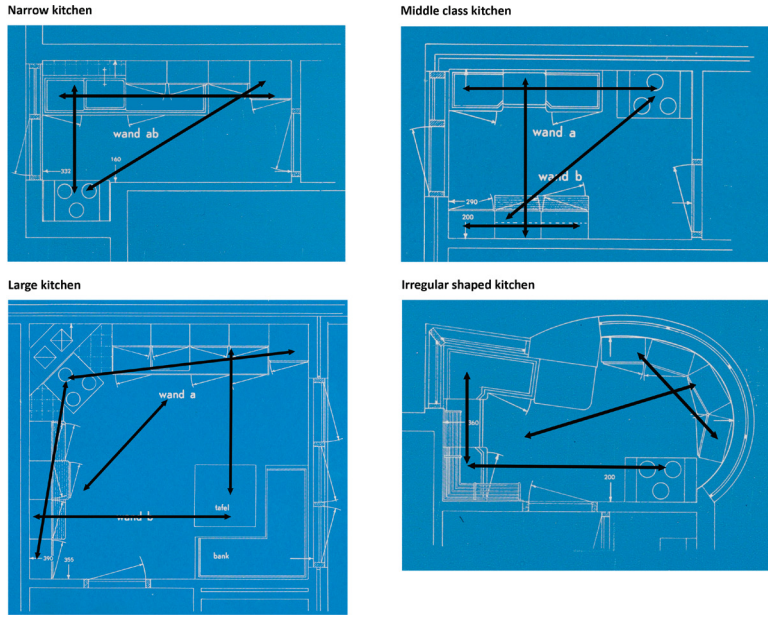

Figure 10
Examples of kitchen layouts, showing the linear composition (Images from Nieuwe Instituut/MEIJ, 35.2; annotations by authors)

The atmospheric drawings in the brochure (Figure 11, top) in Zwart's archive demonstrate the linear arrangements on opposing kitchen walls in a different way. The left drawing shows a modes arrangement with a gas stove; in the right drawing, we see a kitchen equipped with an oven. It may be two kitchen proposals for different types of households, or the two spaces may be considered complementary to separate ritual household and kitchen tasks. Like the published manual *Domestic Indoor Gymnastics for Everyone*, he uses photography in the kitchen leaflets to draw illustrations that visually communicate the kitchen use.

According to art historian Roding (1981), Zwart's kitchen consists of a fusion of the best kitchen elements from Limperg, Janzen, and the Amsterdam Building and Housing Service ABHS designs. The NIVE had made Janzen's and ABH's blueprints available to Zwart in confidence (Roding, 1981). In fact, the cabinets in Zwart's visual presentations are composed in a linear arrangement similar to the *Holland Kitchen* of architect J. W. Janzen, proposed to the *Nederlandse Vereniging voor Huisvrouwen* (NVVH) in 1929 (Figure 11, bottom). The kitchen elements are also reminiscent of Limperg's design based on the Belgian *CUBEX* kitchen, but the scenographic window is gone. In Zwart's archives, we found no studies on ergonomic body movements, but we did find new kitchen inventories for the utensils based on the information he gathered from the Dutch associations for housewives and the NIVE.

Figure 11
Preparatory drawings for a *Bruynzeel Kitchen* folder (top) (Images from Nieuwe Instituut/LIMP, 35.2); The *Holland Kitchen* in v. d. S. (1930) (bottom) (Images by Het R. K. Bouwblad)

Two Designers, Two Interior Design Profiles

The life and ideals of Koen Limperg (1908–1943)

The Amsterdam-born Koen Limperg began his higher education in 1925 at the School of Architecture and Decorative Arts & Crafts in Haarlem. When the school closed in 1927, he moved to the technical high school (MTS) for Architecture in Utrecht, where he continued working at the interface of science and arts. Its student fraternity was active in gymnastics, games, recitals, music, and drama. With his degree in civil building engineering at 22 years old, Limperg established his office with Gerard Johan Meijers. Before that, he worked briefly for architect Herman Ambrosius Jan Baanders, a protagonist of the Amsterdamse School who designed major housing projects in the 1920s. Limperg also shortly assisted Jan Wils, a Frank Lloyd Wright adept who designed the *Olympic Stadium* in Amsterdam.

Limperg's commitment to social development and efficiency in the design field can be explained by his family background. Koen's grandfather, Theodorus Limperg, was a draftsman and an engineer. He married Mathilda Speijer, who was born of Jewish parents. They had two children, Louis Limperg (an accountant who married Ida Altink) and Théodore Limperg. Théodore was the first professor in Business economics at the University of Amsterdam and married Ida's sister Emma.[9] They had three children: Koen, Theo, and Emmy. Under the influence of the group of architects *De 8 en Opbouw*, Theo was a lawyer who specialised in copyright. Emmy obtained a PhD in economics and, from 1955 until 1960, chaired the *Nederlandse Huishoudraad* (NHR) in The Hague, which was a branch of the NVVH founded in 1950. She was subsequently in charge of socio-economic and sociological research at the renowned Institute for Agricultural Research (ILO) in Wageningen from 1960 until 1965. Koen Limperg would remain "under his father's financial support as his practice did not make enough profit" (Roding, 1981, p. 9). He married Maria Loopuyt, the daughter of the Amsterdam socialist councillor Jos Loopuyt.

Going through Koen Limperg's oeuvre, we notice the architect's commitment to the common good. The number of private projects in his oeuvre is low and primarily situated in Jewish circles, e.g., the department store Metz & Co and the car dealer Auerhaan & Sons. However, above all, we see Limperg's commitment to improving the living conditions in housing in the country's larger cities and to inform about evolutions in other countries. He had an analytical mind

[9] Over the years, Théodore Limperg collected art and furnished the home with furniture from *'t Binnenhuis*, a salesroom in Amsterdam that was co-founded by Hendrik Petrus Berlage to buy arts and crafts (Houkes, 2020).

with which he denounced the social ills of the time. For the last issue of *De 8 en Opbouw* in 1934, Limperg submitted a cartoon about the poor conditions in mass housing to which he had been sensitive since 1932. Dutch art historian Juliette Roding considered the cartoon his "personal manifest" (Roding, 1981, p. 10). With this critical eye he inherited from his father, Limperg held board positions as chairman of CIAM V in Paris on *Logis et Loisirs* [Home and Leisure] and as a member of the Architectural Care Study Group on Postwar Housing from 1942 until his death in 1943.

Figure 12
Decors designed by Limperg in *Adolphe Appia* style used in *Hellerau*, a scene from the De *Amazonen* (Photograph by Kurt Kahle from Nieuwe Instituut/LIMP, 53.1)

Apart from technical aspects such as acoustics, heat, and sound insulation in the home, Limperg also focused on kitchen interiors. As an advocate of 'new building,' a Dutch branch of the international functionalist movement of the early 20th century, he edited, for example, the modernist architectural journal *De 8 en Opbouw* and published two books, *Kitchens* (1935) and *Farmhouses* (1938). He co-authored *Kitchens* with his associate Meijers, for which they also engaged cooking teacher and nutrition specialist Mrs. Lotgering Hillebrand of the Amsterdam New Housekeeping School. Most likely, Limperg and Meijers met her on one of the Efficiency Days organised by the NIVE. She had her own radio cook show on the *Algemene Vereniging Radio Omroep* (AVRO) and gave a lecture in 1928 on behalf of the Dutch organisation for housewives (NVVH). Most relevant, she published a Dutch translation of Erna Meyer's *Der Neue Haushalt* (1926), with whom J. J. P. Oud had worked together. Meyer was of Jewish descent, and therefore, her work and Lotgering-Hillebrand's on the translation may have been a suitable reference. The book

provided extensive information on kitchen references in several types of transport, bad and good practices, design advice, and also an extensive inventory of kitchen utilities and dimensions. The editors shared their appreciation for the standardised *CUBEX* kitchen but also for the *All Electric Kitchen* presented at the *Ideal Home Exhibition* in 1934. Not surprisingly, both cases would become a reference for his *Bruynzeel Kitchen* design.

Limperg also designed stage sets for various performances from socio-cultural organisations.[10] He designed for the Ladies' Student Association Amsterdam a set of decors in *Adolphe Appia* style used in *Hellerau* (Figure 12), a theatre by Heinrich Tessenow, which Cornelis van Eesteren admired, for the piece *De Amazonen* (The Amazons). At the same time, he was engaged in costume design, for example, for the famous Polish-born dancer and singer Chaia Goldstein, who had fled Germany. Limperg realised decor sets in diverse locations or situations, such as theatre and dance, but also exhibitions for stores and fairs. Later, in the early 1940s, he staged travelling exhibitions on home economics, such as *Huishouden van Nu* (Contemporary Household) for the Committee on Household Information and Family Management and another exhibition, *Westland*, for the Dutch Agricultural Chamber of Commerce.

The pragmatic approach of Piet Zwart (1885–1977)

The Dutch designer Piet Zwart (1885–1977) studied from 1902 to 1907 at Amsterdam's *Rijksschool voor Kunstnijverheid* (Amsterdam State School for Arts & Crafts), where he took classes in drawing, painting, architecture, and applied arts. Consequently, he taught drawing and art history for several years at the *Industrie en Huishoudschool voor Meisjes* (Industry and Household School for Girls) in the north of the country, in Leeuwarden, where his later first wife Marie Ketjen, daughter of a timbre merchant, gave cooking classes. Zwart came from a less privileged and communist family (Brentjens, 2008). He eventually decided to return in 1913 to Voorburg and started the same year at the *Technische Hogeschool Delft* (Delft Technical University College) until the Great War broke out. Afterwards, he became a draftsman with the architect Jan Wils. Consequently, Zwart worked at Berlage's office in The Hague until 1927, where he collaborated with members

[10] For example, in his scenography for the theatre piece *De B.21 vliegt om de wereld* (the B.21 flies around the world) in 1935, Limperg addresses rhythmic gymnastics. In addition to his architectural design that he realised four years later for the open-air theatre *Zonheuvel* (Sun Hill) in Doorn, Limperg's drawings of nude sunbathers reveal his visit to Ascona in 1937, where the famous Monte Verità had been the meeting place of Lebensreformers and intellectuals and artists gathered such as Sophie Täuber-Arp and the choreographer and dance theorist Rudolf von Laban.

of de Stijl, such as Laszlo Huszar and Jan Wils. He was very familiar with the modern movement and even gave in December 1929 a guest course in typography at the Bauhaus in Germany, which gave him international recognition in this field (Brentjens, 2008). Today, Zwart is best known as an industrial designer or typographer. However, due to his self-taught attitude, he combined several aspects of the design profession, for example, photography, interior architecture, and graphics, giving his work an unconventional, multifaceted dimension at the intersection of different disciplines.

Figure 13
Piet Zwart posing on a chair (left) (Image by Piet Zwart, The Dutch Photo Museum); Piet Zwart posing in front of a modernist window on the cover of *Domestic Indoor Gymnastics for Everyone* by van Blijenburgh (1930) (top right); the physical exercises demonstrated with home furniture in van Blijenburgh (1930) (bottom right) (Image by Piet Zwart, private collection of Selin Geerincx)

His archive indicates that Zwart was involved in sports-related design commissions, including the handbook for body workouts at home and Bruynzeel's sportive sailboat interior design. In 1930, he worked on the graphic layout of the handbook *Kamergymnastiek voor Idereen* [Domestic Indoor Gymnastics for Everyone].[11] This publication by van Blijenburgh (1930)[12] presents descriptions for exercising at home (Figure 13).

[11] Zwart experimented with photography, a progressive medium at the time, to create an attractive cover for this handbook. His entire photo collection clearly indicates how he uses the camera as a tool to artfully document everyday life.

[12] The author, former Dutch military and Olympic fencer dr. W. P. Hubert van Blijenburgh, was the first to obtain a doctorate in Physical Education at the Faculty of Medicine of the University of Ghent, Belgium and continued to actively contribute to physical education in the Netherlands.

A second commission was the interior design of Bruynzeel's successful sailing boat in late 1935 to be equipped for long-term competition races. Zwart saw this as the ultimate opportunity to get rid of traditional thinking in boat interiors. He wanted to adapt the interior to the needs of sailors' work on the boat by applying the philosophy of the Modern Movement. Zwart noted that he could only rely on "a nice little picture [of a sail boat's interior] from an American magazine" (Zwart, 1937, p. 167). He concluded that there were many sea racers beautifully designed for speed. Still, he complained that the interiors below the deck were 'petit-bourgeois,' with a parlour and the use of traditional materials and furniture, referring to old feudal notions. Basically, it was about furnishing as good as possible so you forget about the sea feeling inside. In Zwart's opinion, the higher the status of future owners, the more desirable this goal was (Zwart, 1937). He believed that the commission for the *Sea Eagle* gave rise to a fundamental change in design from the usual traditional and representative furnishing style to a rational design. He used lightweight materials to save weight, prompting designs with different structures and shapes.

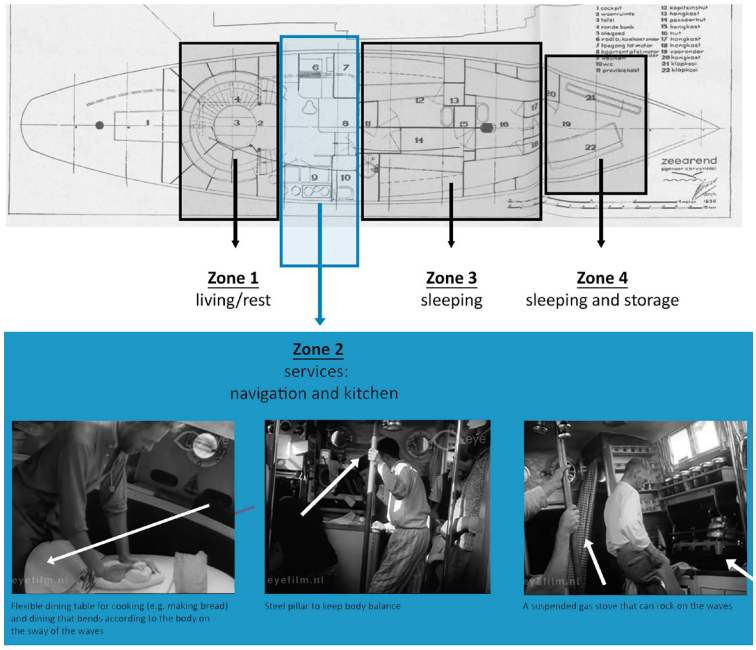

Figure 14
Interior organisation in plan layout of Bruynzeel's *Sea Eagle* sailboat (top) (Image by Piet Zwart (1937); annotations by authors); interior usage in film stills from *Sea Eagle*, 1941 (bottom) (Collage by authors; images captured from film by Jan Hin)

Zwart's detailed analysis of the required sailing actions needed for long-term competitions led to an innovative functional layout of the Sea Eagle. The search for the best place for the captain's cabin was vital. Zwart understood it was important to find the 'dead

zone' of the yacht where the longitudinal movement of the boat is lowest. Only then could he create a fully functional layout of the boat's hold and deck. He thus organised the various functions in relation to the upper deck (Figure 14). The life above and below are mutually connected: life below deck makes some obstacles above deck inevitable, and the intense activity on deck requires immediate contact below for navigation and radio messages and provision of food and drink for the crew above. But also, the furniture had to be flexible and sturdy to absorb the sea waves, e.g., with steel pillars. A bike saddle in the navigation area allows for easier steering and quick jumping on and off.

The daily household activities reformed through an emerging body culture

Comparing Limperg and Zwart, we see two different responses to the need for a modern form of housekeeping in the kitchen. In their plans, they deal with standardisation differently. As the initiator of the negotiations, Limperg's *Bruynzeel Experimental Kitchen* proved his sensitivity to the spatial experience of the kitchen and how he perceived the kitchen as a spatial environment in which all aspects, furniture and walls, deserved design attention. The experience of open space, free movement, and nature is important. Furthermore, the structure of the kitchen space reflects the rhythm of a circular or ritual dance in gymnastic movement: a counterclockwise circulation through space. After all, Limperg did not only design the cabinets; his technical plans also proposed a space. This becomes clear from the suggested window he designed, which offered a perspective of a rural landscape.

It is an example of Limperg's qualities as a scenographer, as *trompe l'oeuils* and perspective drawings are important tools in the theatre world but not part of the vocabulary of modernists who aim for authenticity, transparency, rationality, and simplicity (De Vos, 2010). Also, his suggestion to paint tiles on the wall (to keep prices low as real faience tiles were possibly too expensive at that time) shows how he was concerned with the overall feeling and experience of the space. He flawlessly combined a laboratory look with a suggestive view of a green landscape. He wanted to provide the housewife with more than just a collection of convenient cabinets during her household duties. It was exactly this kind of kitchen features that we, as interior designers, could notice, while the art historian Juliette Roding, who studied the work of Limperg, made no mention of it.

When we have a look at Piet Zwart's input, we discern in his design approach a shift from the body-object-space relationship to a body-

object relationship. Piet Zwart was much more focused on the cabinets and their flexible combinations. He designed the cabinets and kitchen utensils with a lot of attention. Still, we could not find any special attention to the spatial environment except for the choice of the colour finishing in sea green and sunny, hygienic white (Figure 9). Taking his sailboat design for Bruynzeel into account, we know that he had experience designing an efficient and purposeful interior. His interest in sports enabled him to think rationally and to standardise in function of the tasks to be carried out to achieve the daily goals. He paid attention to body movements in the kitchen and physical movements as such, since he was familiar with gymnastics. But Zwart seemed to design a kitchen with an emphasis on 'execution,' as is common in industrial design.

We see a parallel with his sailboat design, where the housewife sits 'below deck' at the service of the 'outside deck' so that the other members can successfully do their jobs outside the house. But inside, she has no visual connection with the outside. In this way, her gaze was kept more inward than outward to focus on her tasks and, as such, facilitate the internalisation process of progressive developments within body culture through sportive physical activity rather than dance. The drawings of Zwart also show how he is more familiar with industrial design, the direction he will specialise in the post-war period. He has a talent for designing furniture ready for production and promotion.

Although both designers addressed their kitchen assignments differently, a common factor in their approach is the inclusion of physical activity. Both were inspired by the emerging body culture,[13] such as promoting more body hygiene, (radio) gym and fitness during their household chores in handbooks and on the radio. This bodily activity is encouraged via circulation opportunities through space and via the use of kitchen furniture as an object.

Conclusion

As demonstrated in this article, the *Bruynzeel Kitchen* is the result of the work of two or even more designers, Koen Limperg, in assistance with Ir. Meijers and Lotgering-Hillebrand, and Piet Zwart. Both main designers, Zwart and Limperg, had an art and architectural education, although Zwart could not finish it because of the war. Both supported the developments within the CIAM; Limperg even became a chairman of the CIAM V committee in 1937 on Home and Leisure, while Zwart

[13] This development came from Germany, where it arose in the wake of the Lebensreform. See Hofer (2001).

taught at the Bauhaus in 1929. Both designers visibly negotiated modernisation through body movement as promoted at that time. Both were in touch with household experts specialised in cooking—Limperg quite explicitly since he was closely involved in the efficiency movement and worked together with Lotgering-Hillebrand, but also Zwart because he taught at the Industry and Household School for Girls in Leeuwarden, where his first wife was as a cooking teacher.

Yet both designers had their own contributions to the development of the *Bruynzeel Kitchen* in order to install a modern kitchen for the masses. Not only did they come in at different stages in the design process, Limperg for preliminary design and Zwart for execution and promotion, but both had different approaches. From Limperg, we clearly can see how his scenography skills were included in the kitchen as a *Gesamtkunstwerk* (total work of art) in which objects, use, and space constitute a whole. The clear documentation of his design steps allowed us to reveal how he was informed by other international kitchen examples and household principles such as labour-saving and efficiency, but also home culture in general. The similarities between his design on the one hand and the *CUBEX* kitchen and *All Electric Kitchen* on the other are particularly striking. He contributed to making a kitchen that clearly met the needs of domestic economists but perhaps not yet all the requirements regarding affordable mass production.

In conclusion, we argue that Limperg has more the profile of an interior designer than Zwart, as he focused on the relation of the body with the objects and the space, while Piet Zwart approaches the *Bruynzeel Kitchen* design more with the profile of an industrial designer whose focus is mainly on the relation of the body with the furniture pieces, their presentability and their manufacturability.

So far, kitchens are mainly studied by art historians and/or historians of technology. Probably, that is also why art historian Juliette Roding paid no attention to the suggested window on the kitchen plans of Limperg, although she discussed his scenography commissions in detail. However, when we approach the kitchen from an interior design perspective, we analyse the kitchen as a whole. Our focus is not only on the objects, but on the space in its totality, including the treatment of its walls. This analysis demonstrates how scenography is an essential aspect of interior design, and how easily it is overlooked by other disciplines.

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