
RESEARCH ARTICLE

Modernity of Electric Light and Shadow: Japanese Domestic Architecture from the Late 1910s to the Early 1930s

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Electric light became popular as a source of illumination in Japan between the late 1910s and the early 1930s. It created novel sensory spaces that made the former darkness of domestic architecture a thing of the past. This article explores the ways in which domestic spaces became overwhelmingly lit by electric lights and how the architect Fujii Koji reacted to them in lighting and architectural design. The shift from embedded local illumination to general lighting entailed changing perceptions about indoor light conditions and how the light-body-space triad revolved around the rejection of interior darkness by electricity-related businesses, manufacturers, and academia. From the mid-1920s onward, this process was further enhanced by the Domestic Electricity Promotion Association, whose illumination planning, exhibitions, and model houses manifested its functionalist approach to effectively distributing light throughout the house, an approach subtly underpinned by a romantic vision of the domestic use of electric light. Functionalism in interior lighting, and the excessive brightness of electric light in domestic spaces, meanwhile, were questioned by Fujii and some lighting engineers. The disharmony between the glare of electric light and the Japanese style of rooms led him to create distinctive papered light fittings installed in his experimental houses, including Chōchikukyo. Fujii's endeavours to scientifically understand and architecturalise diffused light through *washi* (Japanese paper) are conceptually similar to cultural critic Tanizaki Jun'ichiro's *In Praise of Shadows*, an essay that rediscovered the systematically manipulable agents that produced Japaneseness: shadows in response to aesthetic discord caused by the emergence of electric light.

Introduction

Tanizaki Jun'ichiro's seminal essay *In Praise of Shadows* revolves around his discontent with 'the much-vaunted "brilliance" of modern electric lighting' in interior architecture (1933: 13).¹ In his view, the hues and textures of ancient dining utensils, meals, clothes, and interior ornaments were interrelated with the mode of appreciation established by the state of everyday spaces. Born in 1886, Tanizaki's early life was lived in a darkness conditioned by the deep eaves, exposed timber frames, shutters, dull-coloured earthen walls, and vaulted ceilings of the conventional house that no longer exists. His *In Praise of Shadows* was the verbalisation of his awareness that such a conventional aesthetics, along with its precondition – interior darkness as a cosmological substance 'in which ghosts and monsters were active' (Tanizaki 1933: 35) – had melted into the air. The popular illumination for indoor lighting shifted from the lam-bent flames of candles and paraffin lamps to the glare of electric light, which uniformly lit the interior spaces and

objects of Japanese houses, making them visually shadowless and ever more superficial. By 1935, nine out of ten households used electricity for indoor illumination (Hashizume and Nishimura 2005: 53).

This article explores novel sensory and architectural spaces created by electric light in Japanese houses from the late 1910s to the early 1930s, with a particular focus on the ways in which domestic spaces became overwhelmingly lit as well as the lighting and architectural design responses of one particular architect, Fujii Koji. The rapid ascendancy of electric light as an interior light source, which Tanizaki experienced during this period, was related to the rise of heavy industry and the chemical- and electricity-related business that accelerated mass production, consumerism, the growth of mass media, and the utilisation of reinforced concrete in architectural construction (Partner 1999: 7–43). These were fundamental social and technological shifts that stirred the imaginations of Japanese secessionists. Horiguchi Sutemi, for example, promulgated modern design as opposed to the prevailing inclination towards Western (neo)classical expressions and an eclecticism that involved the combination of symbolic elements from Japanese and Western architecture (Oshima 2009). Fujii was another

architect who pursued modern design, particularly in housing (Kojiro 1963: 161–174). He is known for his research into rationality in design through the pursuit of Japaneseness in the qualities of space; a body of his work has lately been recognised as a precursor to later developments in the engineering of architectural environments (Koizumi 2009). Harry Harootian's discussion of inter-war cultural discourses and Japanese modernity implies that Tanizaki's reminiscence on conventional aesthetics and Fujii's endeavours to visualise Japanese taste were each a part of modernism that embraced two intertwined approaches to the origin of the form of expression: the application of the inner logics of things and creation through the rediscovery of historical and cultural authenticity (2000: x).

Cultural nationalism and a series of wars between 1931 and 1945 not only engendered a cultural inclination to vernacularity, the genuine link to Japan's historical past in arts, design, and architecture, but also prompted calls for a rationalisation of life through modern amenities, including electric appliances (Kashiwagi 2000; Reynolds 2009). But the cultural response to the emerging technology of electric light was more complex. According to Miyao (2013), the production of shadows in Japanese cinematography of the 1930s was a trend that combined the influence of Tanizaki's *In Praise of Shadows* in the film industry with filmmakers' yearning for more sophisticated Hollywood lighting techniques, namely low-key lighting for accentuating shadows using a hard electric-light source, a sophistication that was unrealisable due to technical constraints. The popularisation of electric light in Japan, Europe, and North America entailed the production of unique technocultural and often didactic meaning in the use of that light (Mizuta 2006; Petty 2014). This process was associated with novel sensory spaces created not only by modernist architects such as Le Corbusier (Samuel 2016: 73–100) and Alvar Aalto (Norvasuo 2014) but also by electrical manufacturers and billboard designers (Hashizume 2006: 11–58; Isenstadt 2018). Yet the dynamic, delicate interplay of lighting design with changing perceptions of indoor illumination and the spatial experiences of the dramatically brighter living environment are rarely discussed.

This article begins by discussing how popular attitudes towards brightness, darkness, and objects of illumination in domestic spaces *per se* were reconfigured through the promotion of the effective use of electric light, which presumed the transformation of lighting practices from conventional local illumination to general lighting. This momentum for change of people's perception of indoor light conditions was further reinforced by the Domestic Electricity Promotion Association (DEPA), established in 1924 to encourage home electrification. Illustrating the ways that interior darkness and gloominess were rejected by electric power companies, manufacturers, and the Illuminating Engineering Institute of Japan (IEIJ), founded in 1916, I discuss DEPA's functionalist approach in the illumination planning for both the Home Electrification Pavilion at the 1926 Grand Electrical Engineering Exposition and the Asahi Dwellings, middle-class model

houses erected in 1929. The reaction of Fujii, and that of some lighting engineers, to functionalism in interior lighting and the 'much-vaunted "brilliance" of modern electric lighting are discussed in the later part of this article, which examines his distinctive light fittings made of paper and his experimental house, namely Chōchikukyo, completed in 1928. I consider how Fujii's design principles and Tanizaki's *In Praise of Shadows* share architecturally similar logics and the same goal, ultimately answering a question raised by architect Isozaki Arata (2011: 90): why was Tanizaki's essay in praise of *shadows*, rather than the *darkness* of the rooms?

For these analyses I use various trade publications including *Mazda-shinpō*, a magazine of Tokyo Denki (now Toshiba) published between 1914 and 1944, IEIJ textbooks, DEPA's periodical *Katei no denki* (Domestic Electricity), published between 1924 and 1943, and the 1930 photographic collection of the Asahi Dwellings, as well as Tanizaki's and Fujii's own books.² The examination of advertisements, commentaries, graphic and photographic images that appeared in these materials allows me to reveal the ways in which the public perception of interior lighting was constructed.

The Taste for Electric Light

It was not until electric bulbs became the major source of domestic lighting that the murkiness of the Japanese interior was relegated to the past. Pre-industrial lighting artefacts created a dimly lit atmosphere around human bodies amid darkness. A typical piece of equipment was a lampstand called an *andon*, consisting of a wooden, bamboo, or metal frame surrounded with paper that screened burning oil or candlelight (**Figure 1**). Like every other piece of conventional furniture, it was movable, set on *tatami*-covered floors where people would sit and sleep, and was intended to bathe hands and faces in soft, diffused light (Inui 1998: 154). A general shift from the *andon* to the paraffin lamp, which occurred during the late nineteenth century to the 1900s, brought no dramatic change in



Figure 1: *Andon*, illustrated in a serialised newspaper novel, Mizuno Toshikata's *Portfolio*, vol. 58, c. 1900. National Diet Library, Japan.

lighting habits. Paraffin-fuelled lamps, originating in the West, were usually placed at eye level by suspending them from the ceiling, so as to increase the visibility of the area around the body (Okuyama and Kawamichi 1999: 76–78) (**Figure 2**). Such a transformation in light sources reached a threshold during the First World War, when expanding manufacturing and electricity-supply businesses began to recognise that the fundamental barrier to home electrification was the material culture of local illumination caused by the Japanese preference for underlit indoor environments. The first issue of *Mazda-shinpō*, published in July 1914, began with its statement of purpose, urging electric power providers to take action ‘to improve the populace’s taste for electric light’ (*Shasetsu*, 1914: 3).

Electricity companies all over the nation ran marketing campaigns ranging from lecture meetings to more appealing moving pictures and spectacular demonstrations. Their advertisements shared a rhetoric about the virtues of brightness and private electricity usage. One slogan that frequently appeared in their publicity campaigns was ‘Good Luck with Bright Home’ (e.g. Katsura 1921: 20). Implicit in these campaigns was the romantic notion that electric light would enable the whole family to enjoy pleasant evenings together for much longer (Uchisaka 1916: 26). The idea may have appealed to a large number of households in those days, as family members were being increasingly compartmentalised by different manners of social inclusion: schooling, factory work, and offices outside of the home. Particularly for the middle classes, the evening was precious, the only time the whole family gathered under the same roof. The original phrase, ‘Bright Home’ (*akarui ie*), was rhetorically evocative, implying the image of a happy family. This subtle nuance added a semantic rather than merely commercial message to the phrase ‘Good Luck with Bright Home’, cognitively linking illuminance level with the state of family relationships, and vice versa.

The justification for illuminating daily living environments was aligned with nyctophobic concepts in the marketing materials of the electricity providers. The connotative meaning of the phrase ‘Good Luck with Bright Home’ was enhanced by the deployment of its inverse,



Figure 2: Paraffin lamp, illustrated in a serialised newspaper novel, *Mizuno Toshikata’s Portfolio*, vol. 46, c. 1900. National Diet Library, Japan.

‘Bad Luck with Dark Home’ (*Shōmei kaizen kan’yū no jissai*, 1922: 11). This advertising copy implied that dimness and gloominess were the sources of every type of misfortune in household business and family relationships (*Shōmei kaizen no jikkō*, 1925: 8). Their purported link to a growing trend of poor eyesight was attacked, too (*Katei higeki no jokyohō*, 1920: 8). The leaflets distributed by electricity providers repeatedly referred to statistical data on national health, informing people of the fact that more than one-third of the total population were myopic, hyperopic, or astigmatic (e.g. Ishikawa 1925: 25). The description of the causes of these visual maladies suffered by an increasing number of Japanese might make them recall their everyday lives and tendency to stay up late, working or studying in poorly lit rooms (*Denki ni taisuru shumi to rikai*, 1921: 8). The essence of such a prevailing biopolitical marketing strategy was encapsulated in Hanshin Electric Railway’s flyer, introduced in a powerful example of advertising in *Mazda-shinpō* (**Figure 3**). Contrasting and visualising the sizes of older and modern letters, it was intended to make people realise how they were unconsciously overstraining their eyes. This kind of advertisement was designed to reveal this evil of modern life, labelling a shadowy, ill-lighted room as a source of physical harm and introducing electric light as the cure.

Academia endorsed the project of the electricity business of purging shadows from the Japanese house. Serving as a platform for cooperation between industry and academia, the IEIJ adopted knowledge of illumination engineering from the West. Indoor lighting techniques defined in this area of study were for general rather than local illumination, and predicated on the uniform distribution of visible electromagnetic energy emitted in the most effective way from luminous sources at certain positions. IEIJ’s adherence to this way of installing electric lights confronted the Japanese household with an underlying cultural assumption in illumination engineering: that the architecture being illuminated was like Western architecture, with brightly painted and papered interiors. This raised the technical question of how to deal optically with the contrasts between the surfaces of ceilings, exposed beams, and walls, whose earthy matte tones acted as light-absorbing layers, and the glossy, reflective surfaces of illuminated objects, including the tops of low wooden tables and *tatami* floors in the conventional Japanese house (IEIJ 1919: 88).

Illumination engineering brought three-dimensionality into the way the public perceived configurations of light, space, and the body, and made the condition of illuminance manipulable. Rather than the proximity of the body to an *andon* in two dimensions, the height and location of a fixed luminous source, and the distance between it and an object being illuminated all became geometrical parameters, which were orchestrated to control the level of brightness (**Figure 4**). As many houses of the elites and the middle classes began to include rooms partly floored with wooden boards, two types of technical advice on the art of light positioning were offered, one for the prevailing custom of sitting down on *tatami* and another for upright seating on chairs. One of the earliest IEIJ textbooks,

published in 1919, suggests that for achieving target illumination in proportion to the size of a given room, the reference height should be approximately 76 cm in the case of a wood-floored space, but 46 cm in the case of a floor covered with *tatami* (IEIJ 1919: 88). To control the amount, direction, and quality of light, the types of light fittings, including lampshades and globes, needed to be carefully chosen by taking into account the purposes of the rooms as well as the light levels of the electric bulbs. Perhaps this instruction also functioned as a reminder of the fundamental difference between their respective pre-suppositions: the programmatic interior arrangement of Western architecture entailed different solutions from the relatively flexible layout of *tatami* rooms.

It was necessary to consider the lighting fixtures in terms of their ornamental quality, and as part of architecture, since their presence, as well as the glaring light they radiated, would become conspicuous overhead at certain positions in the room. The harmony of the design of light fixtures, such as pendant lights and brackets, with the proportion and style of the interior decoration is emphasised in the 1919 textbook and subsequent IEIJ publications (e.g. Takeda 1926: 798). The logic behind

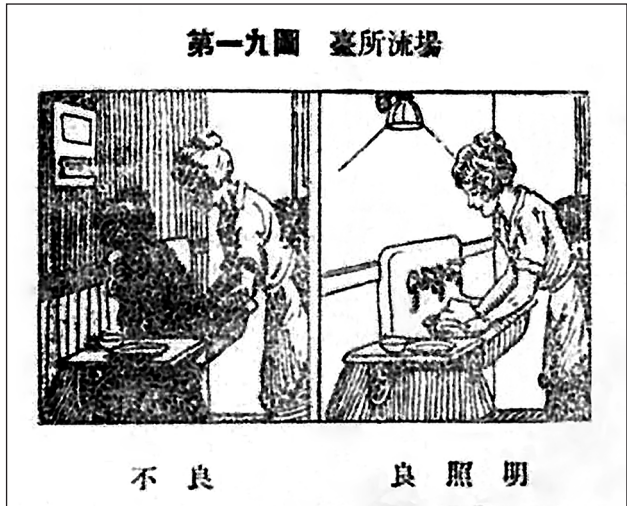


Figure 4: 'Daidokoro nagashiba' [(Lighting in the kitchen sink)]. The juxtaposition of images, showing bad lighting (left) and good (right), underlines the significance of three-dimensional light positioning, assuming that the avoidance of shadows is key to determining where a luminous source is installed (IEIJ Tokyo Branch 1927: 201).

めしすおの燈電燭高

Mrs. Ume McGlew, Japanese Woman of Kobe
Motors Through United States And Britain

Mrs. Ume McGlew, a Japanese woman living at Shioya, a western suburb of Kobe, recently returned from a 10,000-mile automobile trip through the United States and Great Britain. She is probably the first Japanese woman that has motored such a long distance.

Mrs. McGlew is the wife of Mr. A. E. McGlew, general manager for Japan of the Vacuum Oil Company of New York, with his office in Kobe. He was decorated by the Japanese Government for meritorious services during the Russo-Japanese war.

In their trips through the United States and Britain, the McGlews were accompanied by Mr. McGlew's brother and sister-in-law, Mr. and Mrs. A. E. McGlew, of San Francisco.

On April 24, 1906, Mr and Mrs McGlew with their son Robert sailed from Kobe for America. Arriving in Victoria, B. C., toward the middle of May, the party went to San Francisco, where they met brother and sister-in-law.

Mrs. McGlew, "was our climb by car right up to the summit of Pike's Peak in the Rockies, which rises 14,100 feet above the sea level near Denver, Colorado. A wonderfully fine though zigzag motor road is laid out from its base to its top, and one can comfortably and safely drive, as we did, right up to the summit, enjoying a grand view of the vast expanding country."

"Fortunately we met with our accidents either in Great Britain, although the results of accidents in which were concerned, the burning of Mr. McGlew's motor into a far burned total loss."

論語卷之一
學而第一
子曰學而時習之不亦說乎
有朋自遠方來不亦樂乎
人不知而不愠
昔
と
今
朱熹

新學期が始まりました
お子達の御勉強には
是非明るい電燈をおすめ致します
お宅の電燈は上の標準に比べて暗くはありませんか
一日僅か數角一、二本の御奮發でお宅の電燈は見違へるほど明るくなりお子達の學校の成績も著しく進歩いたします

電燈は間ごと
三燈ノ間ニハ 二十ワット
四燈半ニハ 三十ワット
六燈ノ間ニハ 四十ワット
八燈ノ間ニハ 六十ワット
十燈ノ間ニハ 百ワット
机の上には
別に一燈
進歩いたします

世界有数の近視眼國民
驚くべき近視眼の増加率
最近吾國民一般の近視眼の増加は驚くべき率でありまして年々徴兵検査の成績に就ても壯丁の三割以上の近視眼があり殊に先年報知新聞に發表された近視眼の統計は左表の通りの驚くべき數を示して居ります

近視眼増加表
百人員中近視眼者數

學級名	大正五年	全八年	全十二年
帝國大學	四十五人	四十九人	五十六人
高等學校	四〇八人	四三四人	四七六人
女子高等學校	一〇一人	一一〇人	一三〇人
師範學校	一一八人	一二〇人	一三三人
中學校	一五九人	一五四人	一八五人
女子師範校	一〇一人	一一九人	一三九人

我が國の教育が普及して眼を使ふことが烈しくなり印刷術の進歩のため書字の字の大きさは大に於て非常な差があり殊に中等學校以上に進む人が大増加して眼を使ふことが甚しいに拘らず明りの使ひ方が不十分なきに外ならないのであります

果して米國の電燈は一燈平均六十三燭であるのに吾國のはまだ平均十四燭にも達しない状態であります

阪神電氣鐵道株式會社電氣課

Figure 3: 'Kōshoku dentō no osusume' [An advancement of brighter lightbulb]. Hanshin Electric Railway's advertisement, exemplified in *Mazda-shinpō*, 25 March 1928.

these instructions was that the position, orientation, and design of lighting fixtures *per se* reflected the relationships between light, space, and the body, and ultimately the flavour of electric light. The elimination of darkness from Japanese houses, to which both the expanding electricity business and academia were dedicated, was a deliberate programme to enhance Japanese perceptions of formless, electromagnetic radiation – light – in domestic spaces, which was to be multifactorial, environmental, and architectural, and subtly added aesthetic evaluation to the installation of electric lights.

Functionalism of Home Electrification

The project of both instilling in the minds of the Japanese a taste for electric light as well as ridding domestic spaces of gloominess had the substantial effect of trans-

forming the majority of residences into dwellings ablaze with light. Nevertheless, the level of electricity usage in general households was still far from DEPA's vision of home electrification that echoed the post-WWI socio-cultural climate where the idea of efficiency in everyday life was highly valued (Ito 2008). It began to tackle the issue of most Japanese dwellings still lacking outlets or wall switches, and obtaining electricity for electrical irons and other appliances from a lighting circuit via light sockets, of which there were generally only a few per household (Figure 5). Lights were usually turned on and off by flipping a switch beside the socket, into which a socket adapter would be plugged, to power home appliances (Ito 1928: 3). A Y-shaped adapter allowed a lightbulb and another appliance to be used simultaneously. Perhaps this varied use of a single socket was culturally apposite for



Figure 5: 'Nashonaruru denki kotatsu' [National electric bedding warmer], the advertisement of the Matsushita Electric Company (lately Panasonic) in 1931. A girl is plugging an electric bedding warmer (*kotatsu*) into a light socket by means of a socket adapter (MEI 1988: 17).

conventional domestic life as a whole, as demonstrated by the functional flexibility of a *tatami* interior that could serve as a living room, dining room, or bedroom.

The Home Electrification Pavilion of the DEPA at the 1926 Grand Electrical Engineering Exposition in Osaka implemented a vision of electricity and illumination available throughout the house. In this pavilion, which attracted a wide audience, about 20 full-size models of programmatic interiors, including a Western-style wood-floored parlour, bedroom, dressing room, library, Japanese-style guestroom, and kitchen, were equipped with a range of lighting and electrical appliances, from the electrical stove and cooker to a cigarette lighter (Kobatake 1926) (Figure 6). These showcases were not merely spectacles but were intended to manoeuvre the population into learning how all corners of everyday life might be streamlined by means

of such appliances suited to specific purposes and effectively lit.

DEPA's creation of home electrical system standards, the Comfortable Dwelling Specifications (CDS), in 1929 was a manifestation of its belief that scrupulous planning for lighting and wiring was the most reliable means for achieving an effective distribution of lights and outlets throughout the house. The CDS was a guideline for the numbers of ceiling, pendant, and bracket lights, as well as wall switches, outlets, and bulb wattages for every type of room, implicitly assuming middle-class lives and dwellings. The application of the CDS was intended to provide easier access to electricity in houses and thus to guide residents towards more appropriate and cultured domestic electricity consumption (Mori 1930; see also Chappells and Shin 2018). The CDS also allowed residents to estimate

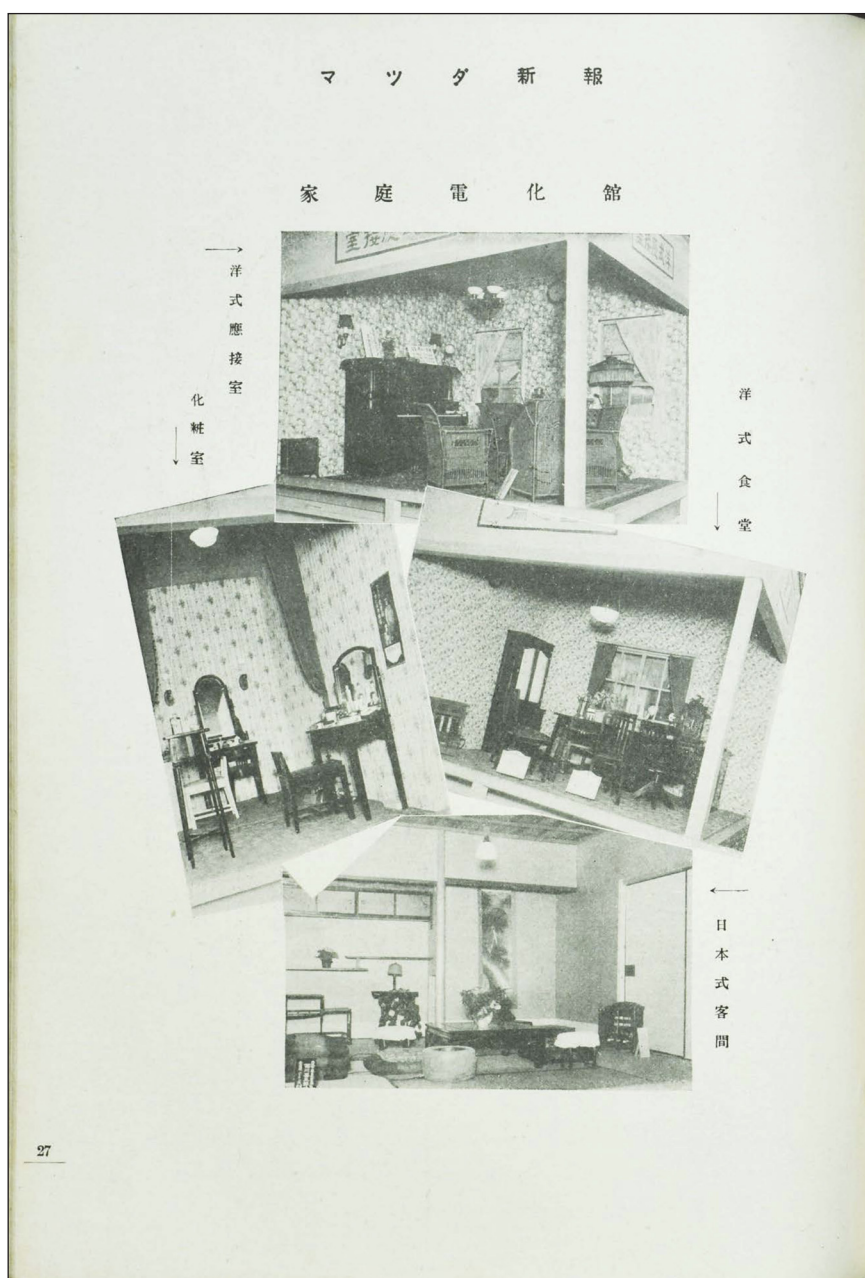


Figure 6: Home Electrification Pavilion, including one-to-one models of a Western-style parlour (top), drawing room (middle left), floored dining room (middle right), *tatami* guest room (bottom), and so on, *Mazda-shinpō*, 1 April 1926.

the cost of a full suite of electrical installations. It provided convincing evidence that the optimisation of electricity usage through purchasing such modern amenities was a wise personal investment in comfort. While the inhabitants were intended to be the principal beneficiaries of these guidelines, the CDS was obviously valuable to the electrical and architectural professions. It was primarily expected to function as a scheme to enable lighting and wiring plans to be made prior to the construction phase, which was crucial for avoiding both trouble with clients and the aesthetic degradation of architectural ideals. In fact, there were many tragic stories of some walls and ceilings of a newly built house being broken to install wall switches, outlets, and wires and then rebuilt to conceal them, since communication between lighting, electrical engineers, and architects was not fully recognised as an integral part of the design process in this period (Fukuoka 1925: 31).

The standardisation of a range of home lighting and electrical equipment, undertaken by the DEPA, was an opportunity to engage in lighting and wiring planning for the model houses constructed as a consequence of the 1929 Housing Design Competition, sponsored by the Asahi Shimbun Company, which ran a newspaper. This contest was an attempt to discover the average house for the new era, and it attracted about 500 proposals. From these, 16 designs were selected and built, each one characterised by notably progressive interior arrangements that expressed the primacy of family and harmony between Western and Japanese tastes (Sakai 2005: 244–245). The Asahi Dwellings, as the group of designs was called, were of a size suited to middle-class families, erected in a new suburban residential neighbourhood in the western part of Tokyo, adjacent to Seijogakuen-mae Station on the Odakyu Line. They were the first cases of the application

of the CDS ('Katei denki fukyūkai no katsuyaku', 1929). During the month of the Asahi Dwelling Exhibition, they were open to visitors and eventually sold for permanent residential use.

The interior lighting of the Asahi Dwellings was not only the outcome of the direct translation of the CDS but also the crystallisation of the cultural assumptions and nuances behind it. For example, the pendant light installed in the living-dining room of a model house, Plan 2, for a family with children, was a fixture that evoked the image of a happy family, or *akarui ie*. The domestic spaces of this two-storey house, with a total floor area of 117.6 m², corresponded with the interwar dominance of *tatami* floors, in contrast to the exterior idiom of Western half-timbered building, a style that rendered and enhanced the pastoral preferences of suburbia (Asahi Shimbun 1929: 8) (Figures 7 and 8). Such an antithesis was also seen between the two wood-floored rooms: the upstairs study room and downstairs parlour. While a room designed exclusively for children, like the south-facing study room of this house, was uncommon, and thus may have been viewed as progressive, the wood-floored parlour near the entrance for receiving short-term visitors resembled typical interwar middle-class houses in its floor plan (Fujimori 1994: 73–75) (Figure 9). Whatever the functions and interior flooring materials, the ceiling lights in most rooms of this model house were characterised by their central location. This position for illumination, at the centre of the ceiling, was a basic tenet formulated in the CDS as a means to fulfil the requirement for an even distribution of light. Presumably, the *raison d'être* of the living-dining room added a more associative meaning to the position of the ceiling lights, which could be viewed as an emblem of the centrality of family and domesticity.



Figure 7: Exterior of the Asahi Dwelling Plan 2, *Asahi jūtaku shashinshū* [Asahi Dwellings Photographical Collection], 1930.

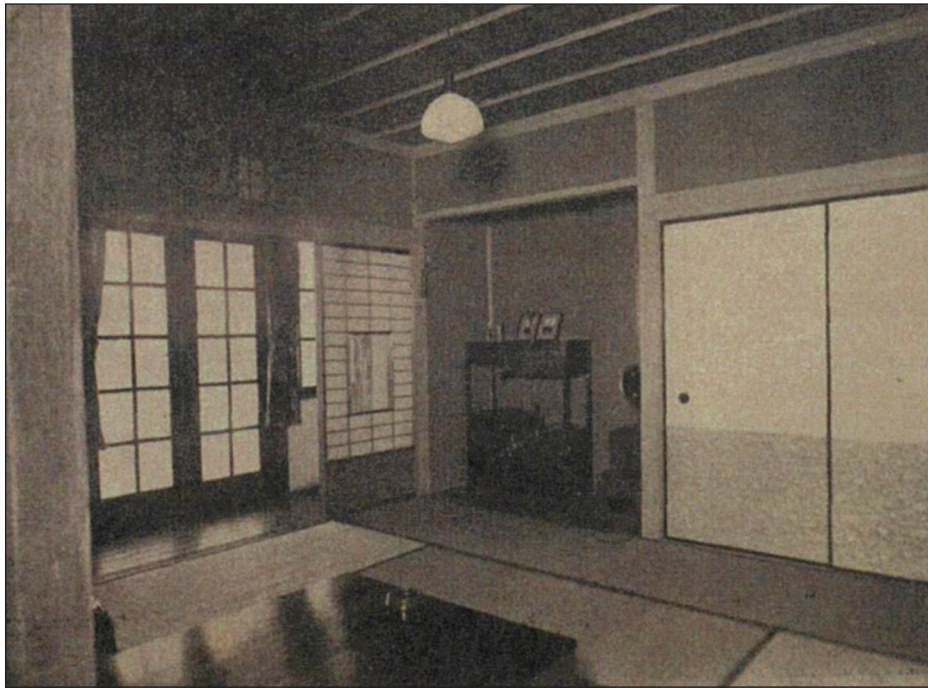


Figure 8: Living-dining room of the Asahi Dwelling Plan 2, *Asahi jūtaku shashinshū*, 1930.

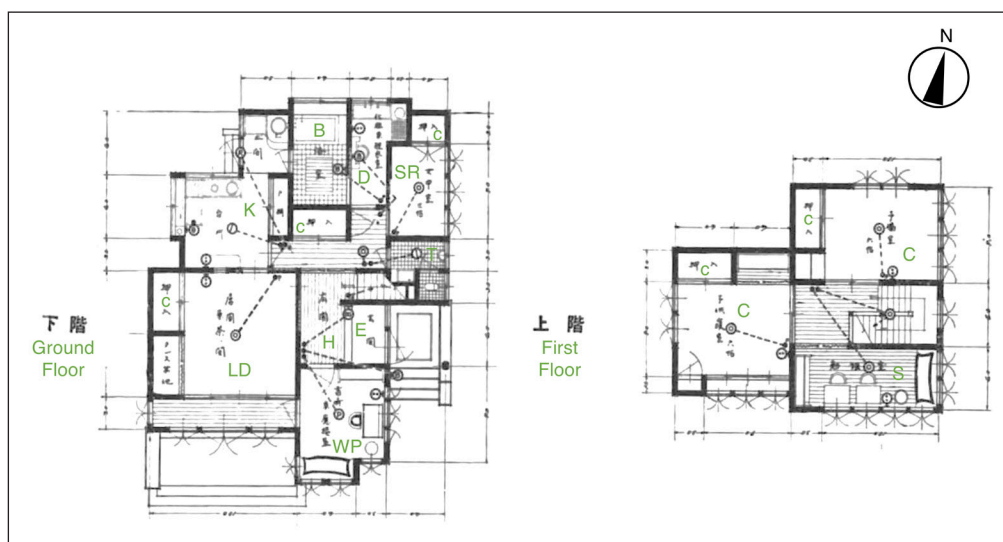


Figure 9: Floor plan of the Asahi Dwelling Plan 2, with the layouts of a set of lighting and electrical equipment (B: bathroom; C: children's room; D: drawing room; E: entrance; H: hall; K: kitchen; LD: living-dining room; S: study room; SR: servant's room; T: toilet; WP: Western-style parlour; c: closet). A compass and legend symbols are added by the author (DEPA 1929: 24).

Adherence to the CDS meant that ceiling lights installed in Japanese-style rooms were mostly the same in design. The pendant light in the living-dining room of Plan 2 shared the features of other glass shades: frosted, milk-coloured, rustic, and bowl-shaped in varying degrees. This uniformity and plainness resulted from the attempts to prevent the design and presence of a ceiling-mounted luminaire from marring the modesty and tranquillity of the conventional interior décor (e.g. IEIJ Kansai Branch 1931: 15–16). This milk-white glass shade was visually suited to Japanese interiors. While the space around the dark-hued ceiling was intended to be suffused with soft light, the bell or funnel shape was effective in distributing

light downward to *tatami* that served as reflective surfaces, thereby enhancing the light level in the room.

This solution was manifested in the tulip-shaped pendant light in the living room of Plan 12, which was single storeyed, 65.3 m² in area, clad in weatherboard, and given variety by the white exterior frames of its large windows (*Asahi Shimbun* 1929: 64) (**Figures 10 and 11**). As it followed the principle of overhead centrality, the family room was symbolically located at the centre, and enclosed by the *tatami*-floored dining room and nursery and the wood-floored parlour, which also functioned as a guest room and library, directly accessible from the entrance (**Figure 12**). In the image of the family room

(see **Figure 11**), two small lamps on top of a chest of drawers are evidence that the Kimura family, residents of Plan 12, also used it as a bedroom during the night. Presumably a lamp was placed at the head of their bedding spread out on the *tatami* and plugged into an outlet beside a doorway to the hall (e.g. Yamaguchi 1926: 38). Kimura's commentary on Plan 12, published in the photographic collection of the *Asahi Dwellings* in 1930, reflects his acute insight into the consequences of lighting and wiring planning, ascribing his satisfaction with the light fittings of his house to 'the balance of a luminaire designed to be suited to each room' (Kimura 1930: 7). Around the 1920s, calls for eliminating gloominess and rationalising

domestic electricity consumption were enhanced by the logic of functionalism that cognitively linked the quality of indoor lighting environments with the amount, types, and positions of lighting and electrical equipment according to the designs and functions of the rooms and the patterns of daily life.

Designing Light and Shadow

The functionalism of home electrification acted to throw off the mantle of darkness from ordinary houses. However, for some lighting engineers, such triumphs of illumination engineering and modern science raised aesthetic questions regarding the relationships between light conditions

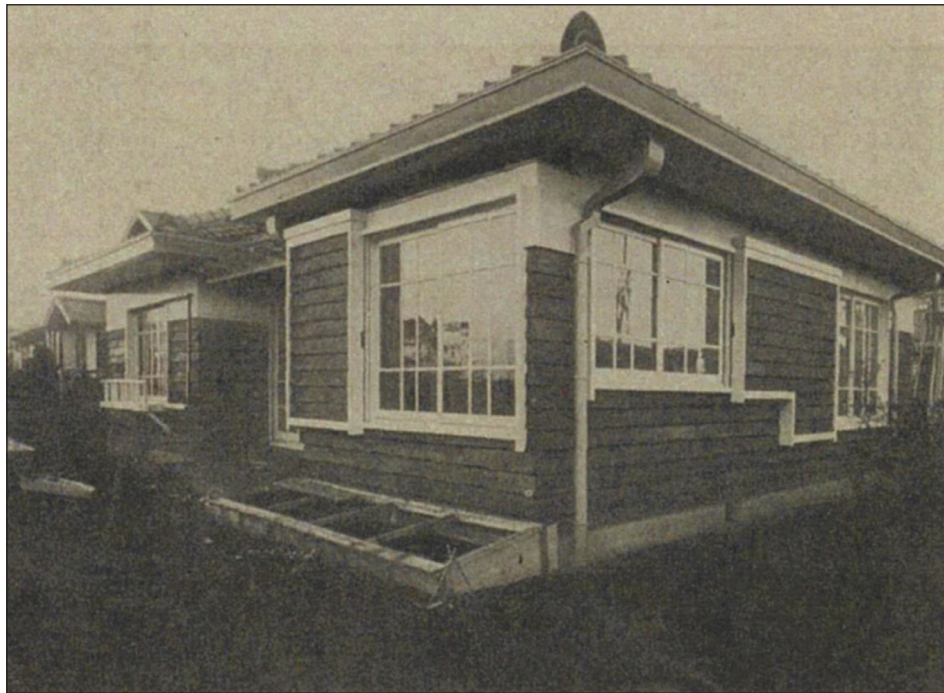


Figure 10: Exterior of the Asahi Dwelling Plan 12, *Asahi jūtaku shashinshū*, 1930.

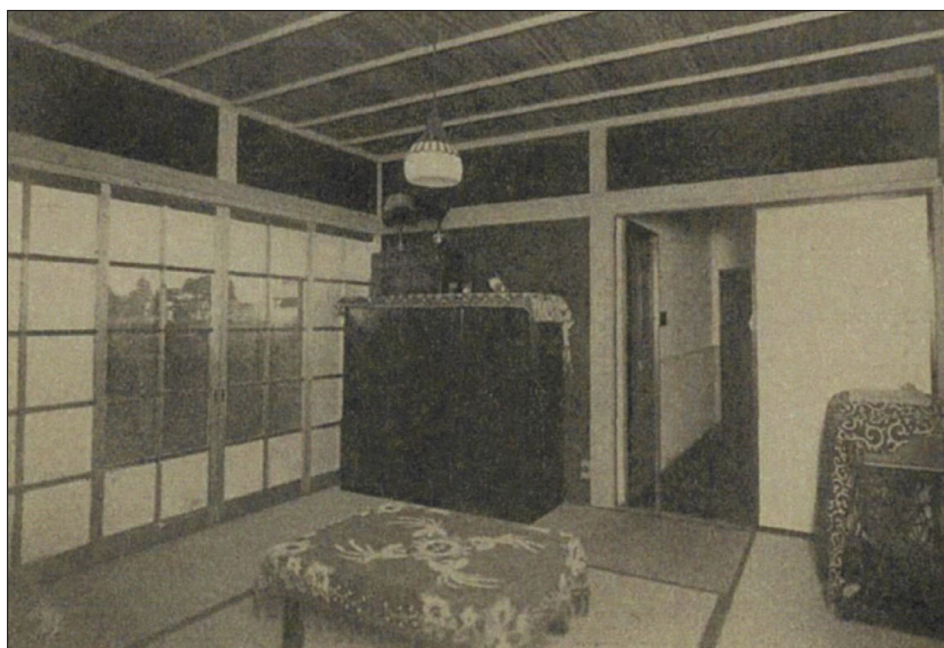


Figure 11: Living room of the Asahi Dwelling Plan 12, *Asahi jūtaku shashinshū*, 1930.

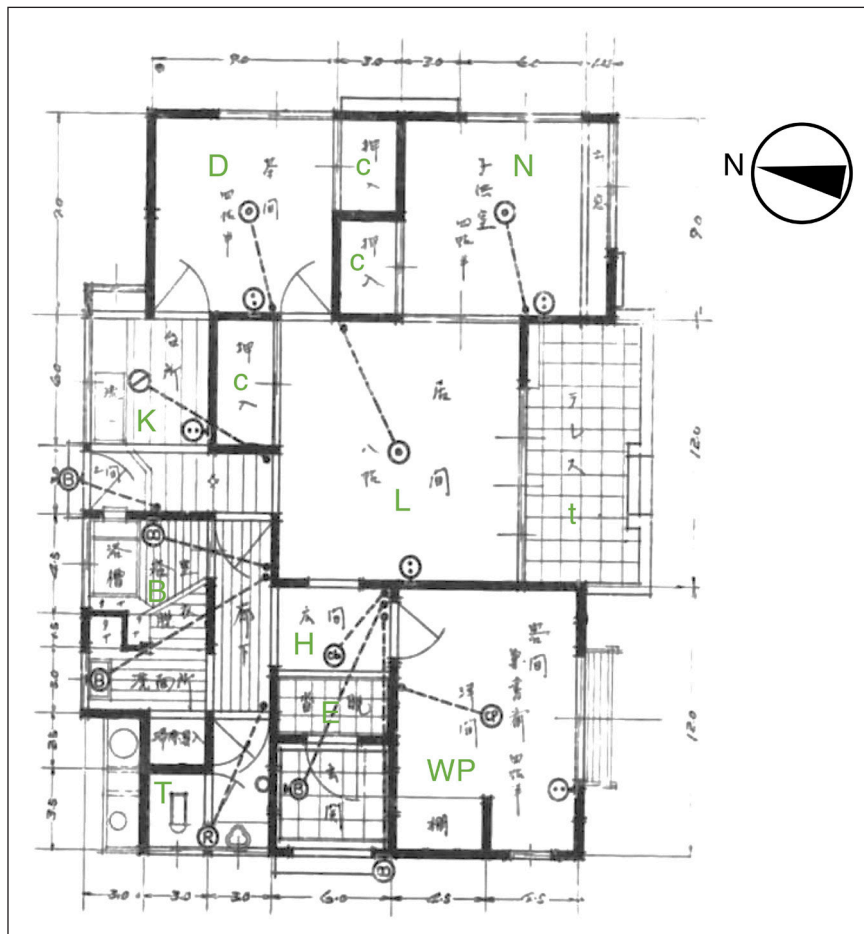


Figure 12: Floor plan of the Asahi Dwelling Plan 12, with the layouts of a set of lighting and electrical equipment (B: bathroom; D: dining room; E: entrance; H: hall; K: kitchen; L: living room; N: nursery; T: toilet; WP: Western-style parlor; c: closet; t: terrace). A compass and legend symbols are added by the author (DEPA 1929: 42).

and Japanese-style interiors. While opalescent sheaths and lampshades were exhibited in the Asahi Dwellings, certain lighting engineers thought that lighting domestic spaces uniformly, from wall to wall, which the proliferation of central ceiling lights suggested the CDS advocated, made Japanese rooms too bright. (Seki 1926: 54). While the increasing overreliance on such lights, they believed, echoed the faith that illumination engineering had in the value of efficiency and rationality from a merely scientific perspective, such overreliance ruined the dynamism and variety created by contrasts of light and shadow (Iga et al. 1935: 10–11).

The remedy for the disappearance of contrast in Japanese rooms, lighting engineers thought, was the use of small lamps, particularly a new type of *andon* that consisted of a frosted, waxy white glass covering around a lightbulb. In *Domestic Electricity*, issued in 1926, Inoue Mitsuo, an electrical engineer for the City of Osaka, referred to the importance of considering how domestic lighting would be subjectively perceived by residents, suggesting that ‘illumination with only small lamps is likely to produce an interesting effect’ (1926: 61; see also Ikusawa 1928: 16). The appearance of the domestically manufactured small *andon*-like lamp, whose purpose was to subtly blend vivid electric light with subdued Japanese-style interiors, was a sort of revival of ancient material culture. Two types were

displayed, perhaps as instruments to deliberately give depth to shade, in the full-scale model of a *tatami* guestroom in the Electrification Promotion Museum in Osaka, where Inoue worked as a director (Figure 13).

Whereas the approach of lighting engineers to genuinely harmonise the radiance of electric light with Japanese rooms was a refinement of the design and illumination effects of light sources, Fujii Koji believed that architecture *per se* ought to be an elaboration that controlled, softened, subdued, and nuanced various types of light in a rational manner. His papered light fittings embedded in ceilings and walls represented his ideology, the fruits of his pursuit of both modern comfort and Japanese taste (Figure 14).

Fujii was born in 1888, two years after Tanizaki. He was an architect, and a cultured intellectual devoted to *ikebana* (flower arrangement) and *chanoyu* (tea ceremony) (Tanifuji 2019: 164–167). Trained at Tokyo Imperial University (now the University of Tokyo), he spent his early career, between 1913 and 1919, at Takenaka Corporation, a major architecture and construction firm in Japan. After he left, his design practices focused mainly on rationalising and remodelling the Japanese house by understanding the mechanisms of air, thermal convection, light transmission, and the relationship between indoor and outdoor environments (Matsukuma 2015: 120–121;

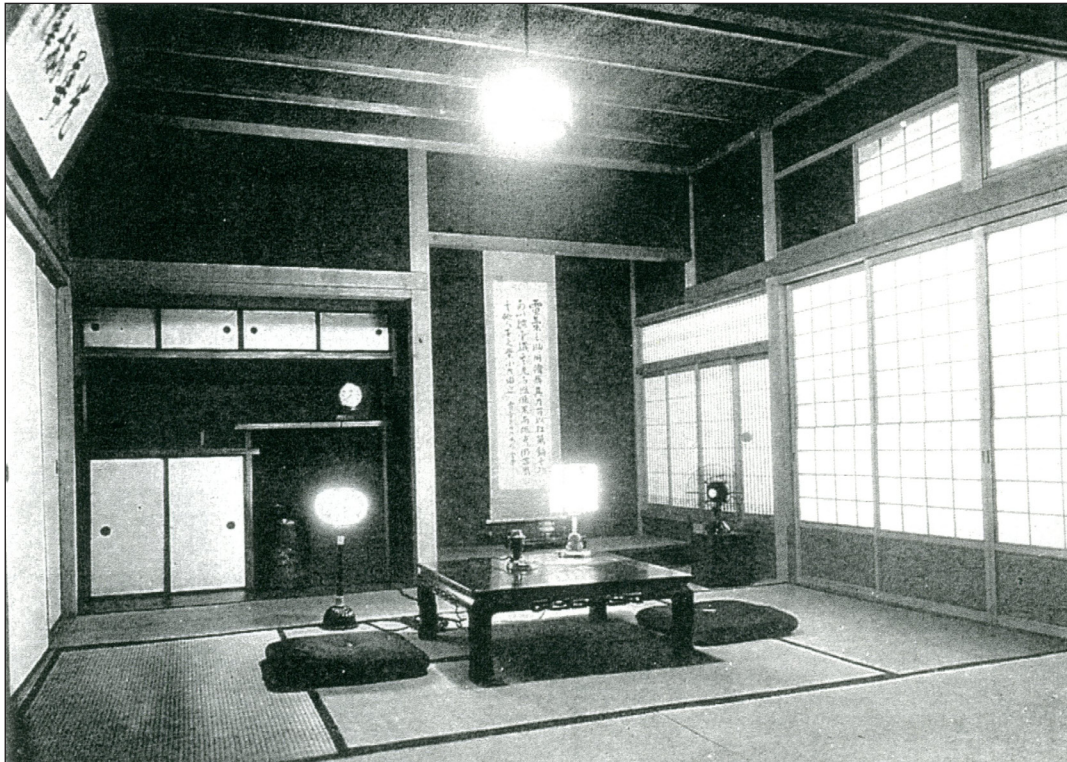


Figure 13: Model *tatami* guest room of the Electrification Promotion Museum, Osaka (IEIJ 1933: 46).



Figure 14: Fujii Koji's papered light fittings. The details of his fifth experimental house, Chōchikukyo, were compiled as *Chōchikukyo zuanshū* [Design of Chōchikukyo in Detail] in 1929.

Tanifuji 2019: 141). This had something to do with the creation of the Department of Architecture at Kyoto Imperial University (now Kyoto University) in 1919, the year he made an architectural tour of the United States and Europe (Uchida 1993: 198–200). Invited by its founding member, Takeda Goichi, who advised his project at Takenaka, Fujii was expected to take a position in this newly established architecture school after the trip and teach building services and the theory of housing (Kojiro 1963: 169). His academic engagement in architecture is characterised by the construction of five full-scale experimental dwellings incorporating *sukiya* (teahouses). His wealthy background allowed him to materialise his approach to housing design that foreshadowed later developments in architectural environment engineering. He tested unique ducts and apertures designed to control indoor temperatures and humidity levels (Koizumi 2009: 35). He and the leading secessionist, Horiguchi Sutemi, were acquainted with each other, both being modernists and graduates of the same college, but unlike Horiguchi, Fujii remained aloof from any movement in modern design (Kojiro 1963: 172–173). At Kyoto, he was dedicated to architectural education from 1920 to 1938, when he died of colorectal cancer the age of 49 (Tanifuji 2019: 158–163).

While Fujii always referred to science in design, science was not necessarily a set of absolute, canonical rules to be used for ordering design. Rather, his scientific approach served as a methodology for marshalling a flood of native and foreign customs of architectural expressions, usually categorised as styles, and for resuscitating Japaneseness (Uchida 1993: 209–210). In the living room of his fifth experimental house, Chōchikukyo, acknowledging a distinction between wooden floorboards and *tatami* was of

little importance, in contrast to the scrupulous attitude in the Asahi Dwellings towards an authentic combination of interior decoration types and flooring materials (Figures 15 and 16). The corner screens in the living room of Chōchikukyo, with geometrical quarter-circular openings that softly separated, evoked the influence of Art Nouveau and Vienna Secession, and were fitted into the space, mostly wood flooring, but with a *tatami* section, all united by the essence of Japanese-style interiors (Ishida 2018: 167–168). The *tatami* area was raised approximately 30 cm in height and open to the larger area of wood flooring to render the eye-level of people sitting on *tatami* with that of people sitting in chairs (Koizumi 2009: 42–44; Matsukuma 2015: 39). In fact, this differentiation of floor levels was mostly consistent with IEIJ standards regarding the reference heights of ceiling and pendant lights in wood-floored and *tatami* rooms.

Fujii's quest for Japaneseness in interior lighting stemmed from his appreciation for the delicate, indistinct light he experienced during tea ceremonies in the shadowy, orthodox *sukiya* that are enclosed by exposed rafters, roof boards, earthen walls, and openings with *shōji* (paper screens). As a *chanoyu* adept, he saw a source of Japanese taste in the state of a set of tea utensils placed on *tatami*, bathed in a patch of mellow natural light streaming through *shōji* (Fujii 1932: 145–146). His light fittings, designed to respect such subtle scenes, consisted of light-bulb sockets embedded in the ceilings and walls, framed glass covers, and Japanese paper sealed inside (Kojiro 1963: 171–172; Koizumi 2009: 135–150). Located in the suburbs of Kyoto, Chōchikukyo was his family home, full of appliances, including electric heating, an electric range, and an electric refrigerator, but he deplored direct



Figure 15: Exterior of Chōchikukyo, *Chōchikukyo zuanshū*, 1929.

beams of electric light in domestic spaces, seeing them as toxic and interfering with the art of cultural appreciation (Fujii 1932: 148).

To Fujii, the conceptualisation of science in the field of architecture was vital to abstracting the sources of Japanese taste from visual phenomena in the *sukiya*. He linked the nature of what was perceived as subdued and mellow to the mechanisms of daylight passing through *shoji* to generate diffused light. Confessing that 'in terms of taste, it is inappropriate to broach numerical evaluation', he conducted a set of experiments to compare the behaviour of light rays passing at angles through three types of horizontal surface: opaque glass, typical *shōji*, and a type of Japanese paper called *Mino washi* (Fujii 1932: 146). The resulting demonstration of thin *Mino washi* diffusing a luminous flux all around led him to apply it to the insides of the glass covers of the light fittings.

In his view, a vernacular type of paper as a building material for Japanese housing was ideal both aesthetically and scientifically. He used *Mino washi* not only as a sort of cushioning medium to transform intense beams of electric light into a serenely diffused glow, but also for wallpaper and ceiling coverings that moderated the temperature and humidity in indoor environments. He strongly believed that 'without Japanese paper, Japanese houses lose their unique qualities' (Fujii 1932: 149). The white walls and ceilings may have been idiomatic references to his modernist identity, but they made sense in terms of lighting effects. Contrary to the gloomy interior of the *sukiya*, composed of unmilled timbers, bamboo, and clay, these white, pale surfaces served as reflective planes that allowed both natural and electric light to travel around the rooms.

The exterior of Chōchikukyo was constrained by requirements for controlling thermal and light energy in the interior. The orientation and size of the openings and the shapes of the eaves were determined parametrically, based upon Fujii's typology, which took into account statistics on solar altitudes as well as climate (Koizumi 2009: 34–51). His scientific approach presumed the blocking of high-angled sunlight in summer and the penetration of weak natural light throughout the rooms in winter, which orchestrated the entire geometry of the roof, site, and interior arrangements, the layout of glass windows with *shōji*, and the position of the ceiling lights that both substituted for daylight as well as illuminated relatively dim, shaded areas (**Figure 17**). Obviously, Chōchikukyo differed substantially from a *sukiya* in terms of interior brightness. As the architectural historian Ishida Jun'ichiro indicates, Fujii's scientific approach to incarnating what was commonly recognised as Japaneseness, including the spirit of the tea ceremony and the intangible, lambent world of *sukiya*, resulted in the invention of a relatively new type of architecture imbued with *sukiya* taste (Ishida 2018: 167–169; see also Sand 2005: 314–315). In this house, his family could enjoy the complex interplay of light and shadow created by the movement of the sun and clouds, as well as the *shōji* and papered light fittings that permanently changed the quality of diffused light and the overall interior environment.

Conclusion

Some passages of Tanizaki's *In Praise of Shadows* convey a fragmentary realisation that the reduction of aesthetics shaped in the conventional, dark interiors to mere historical traditions was caused by the transformation of both

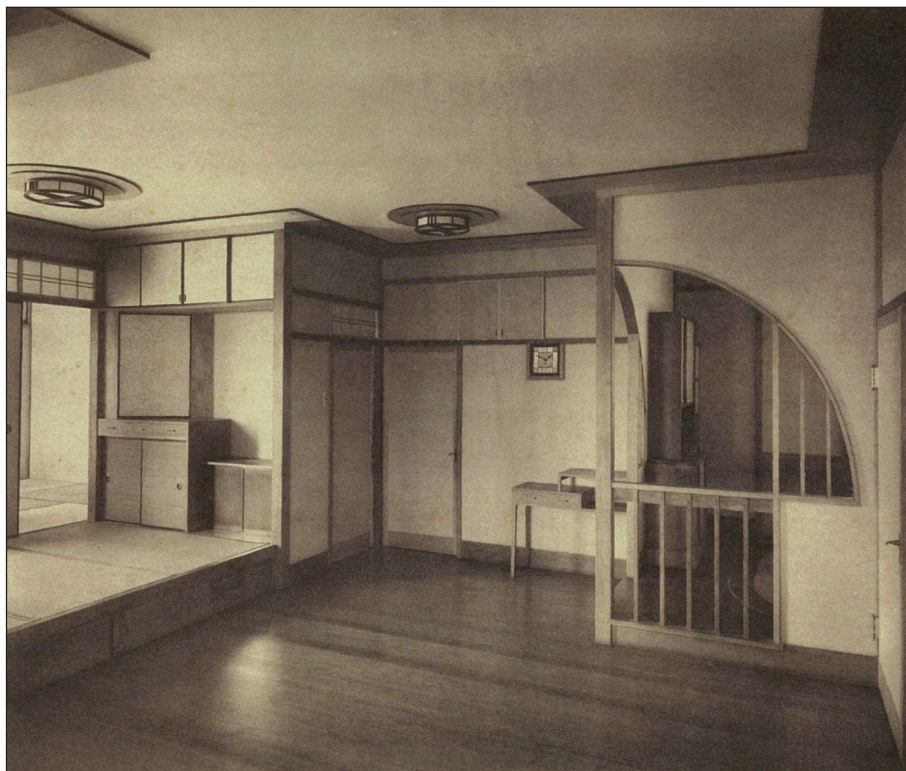


Figure 16: Living room of Chōchikukyo, *Chōchikukyo zanshū*, 1929.

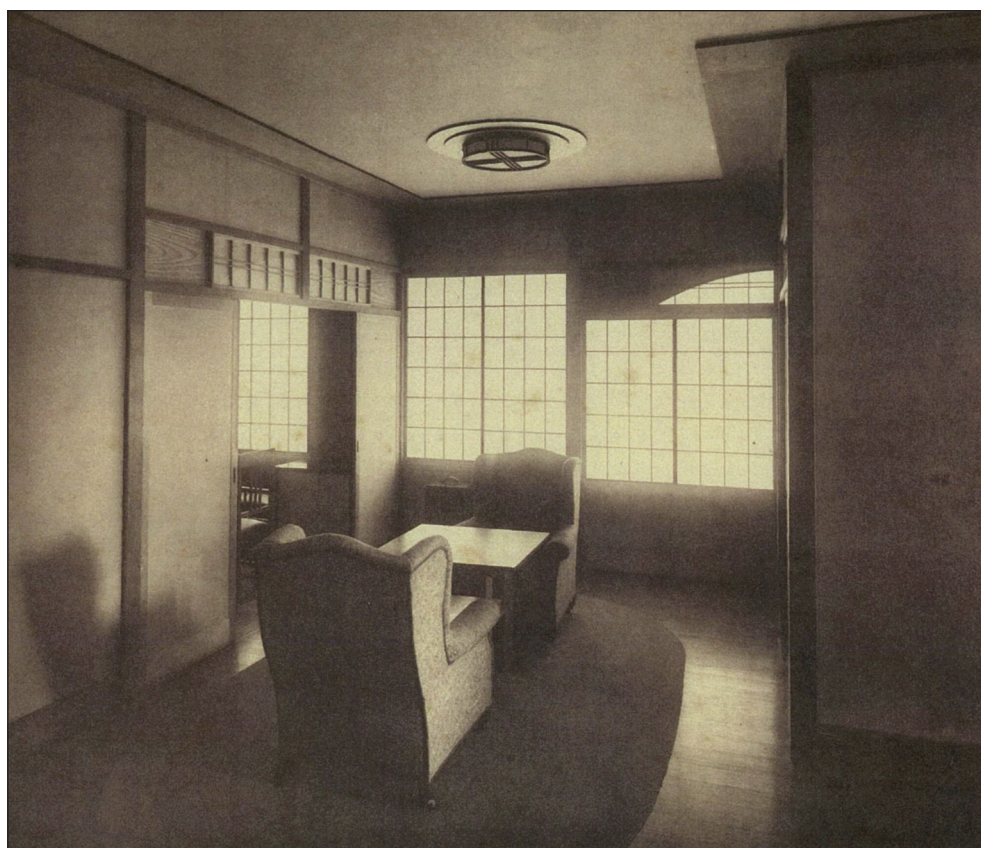


Figure 17: Diffused light through *shōji* in Chōchikukyo, *Chōchikukyo zuanshū*, 1929.

material relationships in everyday life and human perceptions. The darkness of the old Japanese house was once a place ‘in which ghosts and monsters were active’, but such a cosmological world of spectres and darkness, which he believed and saw in his early life, had evaporated. The Japanese system of value for the quality of indoor light conditions changed dramatically, as the campaign to instill Japanese people with a taste for brilliance and luminosity, launched by the electrical suppliers, manufacturers, IEIJ, and DEPA, had persistently involved didactic, biopolitical messages about how the absence of light was unhealthy and inconvenient. Tanizaki himself was too informed and enlightened to accept living in dark, gloomy rooms without electric light. In fact, there is an anecdote that reveals his uneasiness when he realised that the architect designing his new house had completely misconceived Tanizaki’s preferences for interior lighting expressed in *In Praise of Shadows* (Ibuki 1994: 209). Though I have made very few references to the impact of the increasing awareness of hygiene in people’s desire for brighter living environments, as the lighting and wiring planning of the Asahi Dwellings implies, the romanticisation of electric light – ‘Bright Home’ (*akarui ie*) – was semantically powerful in its appeal to the Japanese middle-class desire for time with family through domesticating electricity.

The fact that some lighting engineers, including Inoue Mitsuo, as well as Tanizaki and Fujii, all simultaneously discerned the ‘much-vaunted “brilliance”’ of modern electric lighting in a Japanese-style room allows us to infer that the relatively novel practice of general illumination was not yet a coherent feature of domestic architecture

in general. The milk-white lampshades and globes suited to the conventional design of interiors were contrived in response to this concern; nevertheless, a functionalist approach to the installation of electric lights, exemplified by the Home Electrification Pavilion and the CDS of the DEPA, raised further issues on how the Japanese taste for the spatial quality of light might be achieved in perfect harmony. The palpable shift from the flickering flame of a paraffin lamp to the glare of electric light, from local to general illumination ‘for dispelling the shadows in the farthest corners’ (Tanizaki 1933: 38), prompted some lighting engineers and architects to address emerging aesthetic questions on not the light levels but the materiality of increasingly illuminated Japanese interiors.

To Tanizaki, any difficulties caused by the adoption of modern amenities in Japanese interiors, from electrical equipment to Western-style toilets, were tied firmly to the lack of ‘our own science’ (Tanizaki 1933: 7). He wrote:

The Westerner has been able to move forward in ordered steps, while we have met superior civilization and have had to surrender to it, and we have had to leave a road we have followed for thousands of years. The missteps and inconveniences this has caused have, I think, been many. (Tanizaki 1933: 8)

This commentary was explicit in the logic of his discourses that revolved around a polarity between the West and Japan; between Westerners and ‘we’; between modern science and vernacular entities embedded in a set of indigenous, practice-based knowledge, for example. As

Thomas LaMarre (2005: 374–377) argues, such a binary opposition was his rhetoric for the rediscovery of particular objects and qualities that made people perceive the essences and uniqueness of Japanese culture. To Tanizaki, the bilateral objectification was a method of theorising these elements as agents that overcame particularly aesthetic discords caused by the lack of ‘our own science’. This way of reasoning consistently underpinned his observations of the optical qualities of space as well as lighting effects, thereby establishing dichotomies: brightness and shadow, direct and diffused light. He associated his desire for re-evaluating diffused light with an increasing demand for ‘electric lamps in the style of the old standing lanterns’, or *andons*, in this period, which he regarded as ‘a new awareness of the softness and warmth of paper, qualities which for a time we had forgotten’ (Tanizaki 1933: 6). Fujii’s invention of papered light fittings and his scientific approach can be understood in this context. The relationship between Tanizaki and Fujii is unknown, but in the late 1920s and early 1930s, they both viewed Japanese paper as a symbolic medium for softening and translating the glare of electric light into certain visual conditions that constructed *modern* Japanese aesthetics.

Finally, I would conclude this article by answering Isozaki’s question, why was Tanizaki’s essay in praise of *shadows*, rather than the *darkness* of the rooms? On the one hand, the Japanese understanding of darkness was being reconfigured and harnessed by the increasingly dominant modern pessimism about its impacts on security and morality in the cognitively three-dimensionalised, tangible spaces around the body. On the other hand, contrasts of light and shadow could be created and reproduced by systematically manipulating the effects of light. In this respect, it can be said that his literary *oeuvre*, which shed light on shadows rather than on darkness, relied implicitly upon illumination engineering, modern science, and functionalism. As Le Corbusier and Alvar Aalto began to prove through their elaborate manipulations of the amount and reflection of natural and artificial light in the design of lamps, as well as the rhythms of light and shadow, functionalism was not necessarily incompatible with inclinations towards incorporeal, ancient religious ideas, the quest for spiritual resonance, humanism, or unity with nature (Norvasuo 2014; Samuel 2016: 73–100). If Tanizaki paved a theoretical path for the architecturalisation of shadow as a modern building component, like glass and concrete, Fujii’s scientific approach can be thought as both a functionalist *and* a cultural strategy to resurrect what the *chanoyu* conventionally presumed in its visual qualities: the placidity and calmness of space sinking into the limbo of oblivion due to the ‘much-vaunted “brilliance”’ of modern electric lighting, through the employment of a scientific understanding of object, light, and shadow.

Notes

- ¹ In this article, Japanese names are given in this order: family name–first name.
- ² The title of DEPA’s periodical was changed to *Hirakeyuku denki* (Growing Electrification) in January 1933.

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Competing Interests

The author has no competing interests to declare.

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