



A New *Mashrabiyya* for Contemporary Cairo: Integrating Traditional Latticework from Islamic and Japanese Cultures

Nermine Abdel Gelil

To cite this article: Nermine Abdel Gelil (2006) A New *Mashrabiyya* for Contemporary Cairo: Integrating Traditional Latticework from Islamic and Japanese Cultures, *Journal of Asian Architecture and Building Engineering*, 5:1, 37-44, DOI: [10.3130/jaabe.5.37](https://doi.org/10.3130/jaabe.5.37)

To link to this article: <https://doi.org/10.3130/jaabe.5.37>



© 2018 Architectural Institute of Japan



Published online: 24 Oct 2018.



Submit your article to this journal [↗](#)



Article views: 309



View related articles [↗](#)



Citing articles: 2 View citing articles [↗](#)

A New *Mashrabiyya* for Contemporary Cairo: Integrating Traditional Latticework from Islamic and Japanese Cultures

Nermine Abdel Gelil

Doctoral Student, Graduate School of Engineering, Hosei University, Japan

Abstract

The *mashrabiyya* is a latticework applied to the windows of traditional residences in the Arab world to both veil women from the gaze of men and to ameliorate the region's hot arid climate. In etymology and design, the *mashrabiyya* is associated with the residential architecture of Cairo. Many scholars are calling for the revival of the traditional *mashrabiyya* because it best balances the social and environmental needs of Cairo's residences. In order to realize such goal however, the following problems must be addressed: its role as a veil, Cairo's air pollution, and its considerable expense. Similar in social and environmental function, the Japanese *machiya-gōshi* (traditional townhouse lattices) offer practical solutions for the problems of the *mashrabiyya*. This paper examines 1) the traditional form of Cairo's *mashrabiyya*, 2) the social, environmental, and economic problems if this form is applied in contemporary Cairo, and 3) how the *machiya-gōshi's* simplicity and capability of adjusting privacy, lighting, and airflow can be adapted to improve Cairo's *mashrabiyya*. At the end, the paper offers a preliminary proposal for a new *mashrabiyya*.

Keywords: *Mashrabiyya*; Islamic latticework; Japanese *machiya-gōshi*; Cairo; veil

1. Introduction

Greater Cairo is a typical mega-city with around 14-15 million inhabitants (almost half of the country's urban population)¹, and its overall net density reached 32,000 inh./km² in 1994, ranging from 109,000 inh./km² in the densely populated districts to 15,000 inh./km² in the least populated². According to the 2003 EIDHS, 92.2% of households in Egyptian urban governorates live in apartment buildings.³ In Greater Cairo, about 70% of its built area is residential⁴, of which 22% are apartment buildings of more than 6 stories, 70% are of 5 to 6 stories, and only 8% are lower than that⁵.

The typical facades of these apartment buildings consist of various compositions of open balconies and openings with Venetian wood shutters called *sheesh*. In response to Cairo's density and conflicting social and environmental functions, people tend to modify their use of these devices by keeping the *sheesh* continuously closed, donning a veil or adding reflecting glass, shades, or by enclosing the balcony with curtains or lattice, etc. Many researchers paid attention to this phenomenon and called for the revival of the traditional Islamic latticework *mashrabiyya* to solve this problem.

In etymology and design, the *mashrabiyya* is associated with the traditional architecture of Cairo.⁶

It "designates a technique of turned wood used to produce lattice-like panels...to adorn the windows in traditional domestic architecture"⁷. It functioned as a screen to both veil Muslim women from the gaze of men and to ameliorate the climatic conditions of the region's hot arid climate. Presently, the use of *mashrabiyya* as screens for windows or balconies is extremely rare⁸ and they can be found only in the historically preserved houses remaining from the Mamluk and Ottoman periods.

According to Mamluk wakf deeds, *mashrabiyya* as a screen applied onto windows appeared after the Ottoman conquest of Egypt in 1517.⁹ During the Ottoman period (1517~1805), Cairo lost its role as the capital of the Mamluk (1250~1517) and became a provincial seat in the Ottoman Empire. Ottoman urban policy aimed to contain the expansion of Cairo and to build atop the Mamluk preexisting quarters.



Fig.1. A Multitude of *mashrabiyya* in a Street in Cairo, 1870
(University of Chicago, Rothstein Collection)

*Contact Author: Nermine Abdel Gelil, Doctoral Student, Graduate School of Engineering, Hosei Univ., 3-7-2 Kajino-cho, Koganei-shi, Tokyo, 184-8584, Japan
Tel: +81-80-5050-6471 Fax: +81-42-387-6322
e-mail: i04r9502@k.hosei.ac.jp

(Received October 11, 2005 ; accepted January 26, 2006)

In this period, Cairo became very dense so courts and larger openings were needed to access, ventilate, and light up the domestic quarters.¹⁰ However, due to their religious conservatism and interpretation of veiling¹¹, the Ottoman also required more privacy and a separate *harim* (female quarters) that could not be seen from the outside. Accordingly, *mashrabiyya* appeared as a device for lightening and ventilating the domestic spaces in the dense city while at the same time protecting women's privacy.¹² By the nineteenth century, *mashrabiyya* was common to all urban households and Cairo's facades at that time were characterized by the multitude of projecting *mashrabiyya* windows (Fig.1).¹³ From the first half of the nineteenth century, however, Muhammad Ali (1805~1848) banned the construction of *mashrabiyya* and encouraged the adoption of modern European architecture.¹⁴ Gradually, the *mashrabiyya* disappeared from Cairo and were replaced by openings with *sheesh* and balconies, which continued to be the only devices offered to residents in Cairo until now.

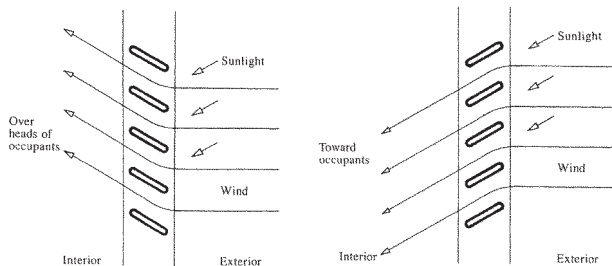


Fig.2. (a) The *sheesh* used in Cairo, the optimal position for blocking sunlight is undesirable with regard to the wind direction, (b) the position for the optimal direction of the air movement in undesirable with regard of sunshine. (Fathy, 1986)

The problem with the *sheesh* has been analyzed by Hassan Fathy¹⁵ who explains that the shutter is made of small fixed slats closely set in a wooden frame at an angle that intercepts sunrays. When the shutter is closed for privacy purposes, it completely obstructs the view to the outside as well as considerably darkens the interior. In addition, wind flows upward uselessly over the heads of the occupants as shown in Fig.2. (a). Even if the slats were arranged to direct wind downward as in Fig.2. (b), the intense sunrays of Cairo would then penetrate directly into the head of the occupants. In addition, the open balconies of most residences in Cairo do not allow women to do home activities related to the outdoor without donning their veil each time (see Fig.5.).

In Cairo in 1995, IRCICA¹⁶ and the Egyptian Ministry of Culture sponsored "Crafts in Traditional Islamic Architecture" as the first ever academic conference to focus on the *mashrabiyya*. The papers and final recommendations of the conference agreed that *mashrabiyya* should be improved, revived and adapted to contemporary lifestyle.¹⁷ However, they offered no suggestions as of how to realize this

common goal.

The aim of this paper is to offer a proposal of what an improved *mashrabiyya* should look like. In order to realize such goal, three problems must be addressed: 1) its role as a veil because its meaning has changed much since twentieth century Egypt, 2) environmental problems due to Cairo's pollution which corrodes the traditional *mashrabiyya*, and 3) economic problems related to the *mashrabiyya's* high cost.

The opportunity of my being in Japan for research purposes has introduced me to the Japanese latticework called *kōshi*, including the townhouse latticework *machiya-gōshi*. Because the *machiya-gōshi* has social and environmental functions similar to the *mashrabiyya*, I suggest that incorporating design elements from *machiya-gōshi* offers practical solutions for the problems of reviving the *mashrabiyya* in Cairo and for adapting it for contemporary use.

This paper first examines the typical form of Cairo's traditional *mashrabiyya*. Second, it looks at the social, environmental, and economic problems if this form is applied as it is in contemporary Cairo. Third, it discusses some types of *machiya-gōshi* that offer solutions to these problems. Finally, it presents a preliminary proposal of how to improve the *mashrabiyya* for contemporary society.

2. Traditional Islamic Latticework *Mashrabiyya*

2.1 Form of the Traditional *Mashrabiyya*

A typical *mashrabiyya* (Fig.3.) is made of unvarnished wood, is either flush with the external wall or extends out from the wall, and is composed of the following parts: 1) the main *mashrabiyya* opening composed of a lower part below eye level with fine turned pieces in a tight lattice pattern and an upper part above eye level with a more open lattice pattern of turned wood, 2) an overhang found immediately above the main *mashrabiyya* opening, and 3) a flat grilled window above the overhang that was often added if the *mashrabiyya* did not provide sufficient airflow.¹⁸

2.2 Problems of the Traditional *Mashrabiyya*

2.2.1 Social Problems of the *Mashrabiyya*:

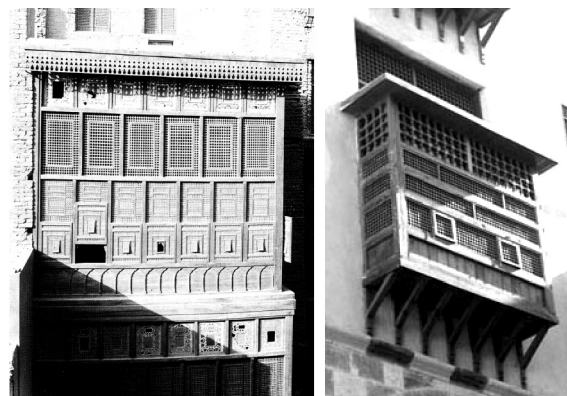


Fig.3. Right, *mashrabiyya* of the *harim qa'a* (women hall) in al-Suhaymi house. (Photo by Tarek Swelam.) Left, *mashrabiyya* with an upper window, Wekala of Bazar'a.

More conservative in interpreting Qur'anic verses concerning the veil than the former Mamluk, the Ottoman regime attempted to control Egyptian women and the way they dressed.¹⁹ Veiling during the Ottoman period implied three points. First, in addition to the veiling described in the Qur'an, women had to cover their faces when in public.²⁰ Such veiling (Fig.4.) was a means of expressing the status and respectability of a woman and her family.²¹ Second, women had to be segregated from men to preserve their sexual purity which in turn contributed to the honor and prestige of the family.²² Finally, women became secluded at home as a result of the wealthy's need to develop and maintain large households which were also a marker of status.²³



Fig.4. Veiling until the 19th and early 20th C. (Lane, 1908.)

For maintaining the norms of veiling, gender segregation, and home seclusion, *mashrabiyya* were applied between the *harim* (female quarters) and any space considered public such as the street, residential court, or *qa'a* (reception hall). Women's role was that of an onlooker. There, they spent hours in the upper floors hidden behind the *mashrabiyya*, taking part in the emotion of the street²⁴ only from distance, watching the dances, and listening to Qur'an readings performed in the court or the *qa'a* of the ground floor²⁵. The tight pattern of the lower part in the *mashrabiyya* (below eye level) insured a woman's invisibility because when looked at from outside it appears as a completely opaque wall.²⁶ In addition, from the house on the opposite side of the street, a woman could be seen neither through the wide pattern of the upper part (above eye level) nor through the flat window above the overhang. This is due to the rules in the *shari'a* (Islamic law) which stipulated the location of openings, their location in relation to the opposite house, the height of the houses, and such.²⁷

Veiling in the Ottoman period went through many changes between the late-nineteenth century and today. Some of these changes can be stated as follows: From the second half of the nineteenth century until the early 1950s, Islamic reformers, feminists, and some elite women began calling for the removal of face veils in Egypt. Gamal Abdel Nasser's socialist policies (1956~1970) encouraged work and supported the principle of sexual equality. During this period, women stopped wearing the veil and gradually began to adopt Western clothing. However, war and eventual peace with Israel, discontent with Anwar Sadat's economic liberation policies in the 1970s, and people's reconsideration of their national and Islamic identity have led to a wide spread rejection of Western values and fashion. Since the 1980s, women began again

to wear the veil but also continued to insist on the freedom of mobility and expansion of opportunities in the workplace, universities, social affairs, and in public life in general.²⁸ Accordingly, researchers²⁹ studying the contemporary veil in Cairo agree that this phenomenon should not be considered a "re-veiling", but rather a "new veiling" for new purposes.

Adopting the veil in contemporary Cairo is a voluntary move on the part of women, meaning that no institution or law forces the veil upon them. However, for many women, the veil is considered a religious command that must be followed because it provides the proper degree of modesty as decreed by Allah. According to their interpretation of Islamic dress, women's degree of modesty varies greatly, and there is no a single veiling uniform like the older Ottoman veil. Within the same household and same house, females expressing various degrees of modesty live side by side. Though having to put their veil in front of the non-kinsmen, contemporary veiled women can mingle with men and her role has been transformed from a passive onlooker through the *mashrabiyya* to an active person both in and outside the home. When going out in public, the contemporary veil provides women with their own inviolable private space.

Just as women in Cairo have chosen to wear the veil as a practical expression of their religious beliefs and identity, the *mashrabiyya* also serves a similarly indispensable role. However, just as the veil has been adapted to the needs of contemporary society, so too should the *mashrabiyya*. In fact, as it is, the *mashrabiyya* presents a number of problems.



Fig.5. A veiled Cairene woman on a modern balcony. (Photo by Simon Mitternacht, 2005)



Fig.6. The Keretleya house, *mashrabiyya* of the *harim* overlooking the ground floor *qa'a*. (The University of Liverpool Online Higher Education)

First, today a woman at home engages in many outdoor activities such as hanging out the bedclothes and washing, watching her children who are playing outside, or calling for a merchant and negotiating the price of groceries. While the windows and balconies of most residences in Cairo today do not allow women to do such outdoor activities without donning their veil each time (Fig.5.), the traditional *mashrabiyya* also does not allow a woman to access the outside for such activities. The traditional *mashrabiyya* had sometimes small windows that opened upwards (Fig.6.) enabling

women to safely unveil when leaning their head into the street.³⁰ However, if applied contemporarily, their size is too small for such activities. Therefore, a *mashrabiyya* that provides women real access to the outside world without putting on the veil is necessary.

Second, because there are various degrees of modesty within the same household, the concern about being seen from the outside or not varies from woman to woman. Even the degree of privacy desired by the same woman differs according to her age, time of day, and other circumstances. The traditional *mashrabiyya* however does not have the ability of being adapted to various degrees of privacy. All the wooden pieces are fixed and so too is the degree of privacy.

Third, for wedding banquets, Ramadan dinners, and many other occasions held at home, women wear the veil in front of non-kinsmen, thus making the veiling of the *mashrabiyya* becomes redundant and unnecessary. During such events, modern windows and balconies are completely opened for ventilation purposes and used for talking, smoking, sitting, or separating from the crowd. Also, the problem of heat and direct sunlight is not an issue because these events are generally held in the evening. Thus, any modification of the *mashrabiyya* must allow for it to be opened and transformed into a modern window or balcony. This characteristic is not found in the *mashrabiyya* panels which are not removable.

Finally, because the *mashrabiyya* must provide light and air while maintaining privacy, the upper part of the traditional *mashrabiyya* and the flat window above it had a wide pattern to compensate for the reduction in light and air caused by the lower part (closed pattern). However, if applied to the multi-storey apartment buildings of Cairo, these environmental functions will conflict with the need of privacy because the interior will be easily viewed and intruded upon by the higher floors of the surrounding buildings.

2.2.2 Environmental Problems of the *Mashrabiyya*:

According to the 2000 EIDHS, 82.9% of households in large cities in Egypt use electric fan. This rate increased in the 2003 EIDHS to 91.8%, while households owning air-conditioner units were only 11.2%.³¹ This owes to the fact that households prefer saving in the electricity bill of which air conditioning represents 32% in the hot season³² extending in Cairo from April to October³³. The *mashrabiyya*, according to Hassan Fathy, is the best solution for the problem of thermal comfort in hot arid regions because its design hinders the flow of heat into the home while enhancing the cooling effect of the wind and humidity.³⁴ With the unpopularity of air-conditioning in Cairo, the cooling functions of the *mashrabiyya* would meet the needs of many households.

Mashrabiyya is generally made of unvarnished turned pieces of wood, fixed together without glue or nails through an intricate method of joinery. This joinery allows the wood pieces of the panels to expand

and shrink with changes in the temperature.³⁵

The lower part blocks the direct rays of Cairo's intense sunlight and reduces the glare. While the openness of the upper part compensates for the dimming effect caused by the lower part (Fig.7.), the overhang on the top of the *mashrabiyya* intercepts direct sunrays. The pieces of wood used to form the lattice are made of many small rounded dowels in order to graduate the penetrating light, softening the contrast between the dark wooden pieces and the bright interstices (Fig.8.). Furthermore, when privacy and sunlight considerations require small interstices, the upper part alone does not provide sufficient airflow, so the grilled flat window above the overhang insures a proper amount of ventilation.

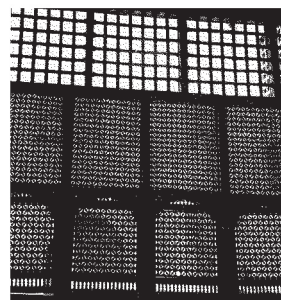


Fig.7. *Mashrabiyya* of the Jamal Ad-Din Adh-Dhahabi house, showing the penetration of light through the parts below and above eye level. (Fathy, 1986.)

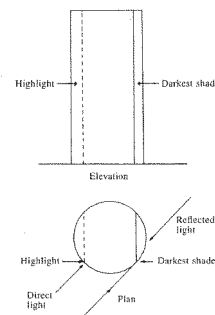


Fig.8. The effect of light falling on a rounded surface. (Fathy, 1986.)

Through a process of evapo-transpiration during the cool evening, moisture carried on the wind passing through the interstices of the porous-wooden *mashrabiyya* (if not varnished) is absorbed by the wooden pieces. Then, when the *mashrabiyya* is directly heated by sunlight, the moisture is released into the air flowing in through the interstices. This process increases the humidity within the home and consequently reduces the interior temperature.

Although the *mashrabiyya's* environmental performance is very appropriate to Cairo's climate, air pollution is one of the main problems preventing its revival. The WHO and UNEP³⁶ cite that the following four problems contribute greatly to Cairo's pollution: desert dust blown into the city, lead from vehicle exhaust, cement dust and heavy metal compounds from factories and smelters smoke, and the poor dispersion of the pollutants due to a lack of rain and low wind speeds. These pollutants contain carbon dioxide, sulfur dioxide, and nitric oxides that, when combined with the moisture in the wood of the *mashrabiyya*, corrode its intricate latticework. Moreover, the accumulation of dust and soot in the *mashrabiyya* produces a thick black layer that hides its original ornamental composition and reduces its capacity of evapo-transpiration.³⁷

2.2.3 Economic Problems of the *Mashrabiyya*:

Other problem of the traditional *mashrabiyya* is its expense. The prohibitive cost of the traditional *mashrabiyya* owes to the time intensive skilled labor required to assemble one. For instance, in the most intricate *mashrabiyya*, a single square yard of latticework can be composed of as many as 2000 pieces³⁸. These pieces are initially turned on a lathe then fitted together by inserting each piece into a hole in the adjacent pieces. Their arrangement produces a lattice pattern which is placed within a frame (Fig.9). Finally, each of these lattice frames is assembled together to form its lower and upper parts.³⁹

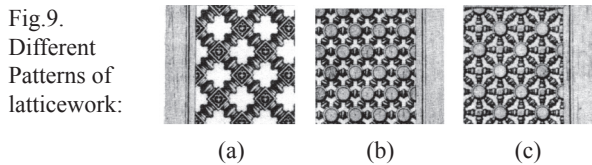


Fig.9. Different Patterns of latticework: (a) four pieces inserted into a central one, (b) six pieces inserted into a central one, and (c) eight pieces inserted into a central one. (Prisse d' Avennes, 1983)

With the modernization of Cairo, however, the reduced demand for the *mashrabiyya* meant the various craftsmen like wood carvers, turners, inlayers, and joiners who built them were forced to either leave their trade or adapt to a shrinking market by providing items primarily for tourist consumption.⁴⁰ Nowadays, the construction of a simple *sheesh* requires little more than the skills of a common carpenter.

In order to adapt the *mashrabiyya* for use in contemporary Cairo, its social, environmental, and economic problems should be solved. In the following parts, I examine some practical and economic characteristics of the Japanese *machiya-gōshi* that can be put to use in solving these problems.

3. Japanese Townhouse Latticework *Machiya-gōshi*

The latticework or *kōshi* seen in Japanese cities can be found in three types of buildings: samurai residences, temples, and townhouses called *machiya*.⁴¹ In this paper I focus on the *kōshi* applied to the *machiya* that are called *machiya-gōshi*. Applying a latticework on the frontages of merchants and artisans' *machiya* began to appear in the late fourteenth century when chronic warfare plagued the capital of Kyoto and the rest of the country requiring townspeople to secure their *machiya* from the constant flow of armed strangers into their communities. Under these circumstances, a sturdy protecting lattice named *dai-gōshi* (stationary lattice) began to be applied in the frontage of the *machiya*.⁴² However, as the country entered a long period of piece beginning in the seventeenth century, the necessity of *kōshi* for security gradually shifted to an emphasis on privacy.⁴³ Consequently, sophisticated lattices were developed and applied to *machiya* in cities throughout the country. Fitted at the boundary between the interior of the house and the exterior street, these *machiya-gōshi*

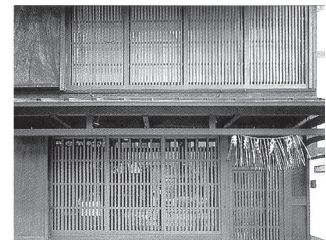
insured the passage of air and light while allowing the inhabitants to see and hear the comings and goings on the street without being seen by passersby.⁴⁴

3.1 *Machiya-gōshi* and Social Problems of the *Mashrabiyya*

In contrast to the traditional *mashrabiyya* panels which are not removable, the *hamekomi-gōshi* allows for complete openness. Generally, the *machiya-gōshi* can be found in two forms: a stationary kind fixed to the façade like the *dai-gōshi*, and a removable kind that can be completely taken out from the window or entryway. This removable kind of lattice is called *hamekomi-gōshi* (Fig.10.) and has mullions that are fixed inside a frame to make a lattice that can be easily locked into pillars or stiles with removable pins.⁴⁵ In festivals, such as the famous *Gion* festival of Kyoto, removable lattices are detached from the facades of *machiya* which then become completely open⁴⁶ (Fig.11.); in this way, a hitherto private space is converted into a semi-public space.



Fig.10. A detail of the removable frame, pillar, and stile. (The author, a survey in Kanazawa City)



(a)

Fig.11. The *hamekomigōshi*, a façade in Hashibenkei City, Kyoto: (a) before taking out the lattice, (b) during the Gion Festival. (*Gaiheki no ishō*, 1999)



(b)

Among the various kinds of stationary *kōshi* is the *musō-mado*. While all the wooden pieces of the *mashrabiyya* are fixed and so is the degree of privacy, the *musō-mado* can be easily adjusted for the desired degree of privacy, lighting, and airflow. This *kōshi* is composed of two lattices: a fixed external lattice and an internal one that slides to the left or right on a grooved track (Fig.12.). By sliding the internal lattice, the intervals of the external one can be adjusted for varying degrees of openness and closeness.⁴⁷

Quite different in form and function is the *sesame-*

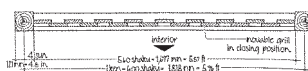
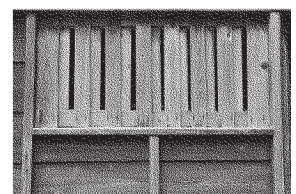


Fig.12. A *musō-mado*, Shimane Prefecture, Matsue City. Above, Plan. (Engel, 1964). Right, Elevation. (Hiyuga, 1997.)



gōshi or fine lattice typically found on traditional teahouse or *chaya* (establishments for the entertainment of men) and haberdasheries.⁴⁸ Unlike the upper part of the *mashrabiyya*, the *sesame-gōshi* provides lighting and airflow without decreasing the degree of privacy because its mullions are beveled and installed with the narrow portion facing inward and the wide portion facing outward (Fig.13.). Seen from outside, the intervals between the mullions are very close thus

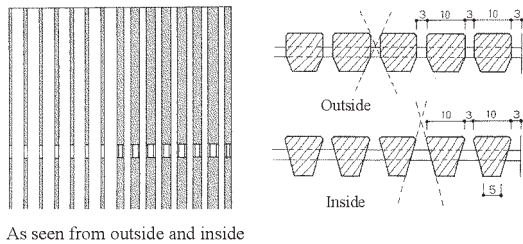


Fig.13. The *sasamegōshi*: Right, Various Plans; Left, Elevation (Nagai, 1996)

providing a great deal of privacy, while from the inside they are quite wide ensuring that a surprising amount of light and air can pass through the latticework.⁴⁹

3.2 *Machiya-gōshi* and Environmental Problems of the *Mashrabiyya*

The advantage of the *machiya-gōshi* over the *mashrabiyya* is its being less exposed to damage by pollutants and being easier to maintain and clean. This owes to the verticality and straightness of the *machiya-gōshi's* construction, which reduces the horizontal surface area and corners on which pollutants and dust tend to accumulate. The overwhelming verticality of the *machiya-gōshi*, aside from the few horizontal slats used for reinforcing purposes, is possible because the deep eaves of Japanese houses eliminate the need for horizontal louvers for shade⁵⁰. The straightness of its construction derives from the use of uniformly shaped mullions which are long slats cut or lathed into rectangular, squared, triangular, circular, or half circular shapes.

3.3 *Machiya-gōshi* and Economic Problems of the *Mashrabiyya*

The *machiya-gōshi* was initially of simple and sturdy design for protection purposes. Even after the appearance of intricate latticework from the eighteenth century onward, it has maintained its simplicity which means that it can be manufactured much cheaper than the *mashrabiyya*. Composed of long straight slats of wood, the material for the *machiya-gōshi* is easily and quickly processed. Whereas the turning process of individual *mashrabiyya* pieces, though mechanized, takes a lot of effort and time depending on the craftsman's skill and experience. Once the mullions of the *kōshi* are assembled into a lattice, the ends of each mullion are inserted into the peripheral frames⁵¹. As such, the number of joints for the *kōshi* is considerably less than for the *mashrabiyya*.

4. Proposal for a New *Mashrabiyya* in Cairo

After taking into consideration its traditional function and design, the problems with that design, and the potential of incorporating design elements from the Japanese *machiya-gōshi*, I offer this preliminary proposal (Fig.14.) for an improved *mashrabiyya* in contemporary Cairo. Made of unvarnished slats of vertically arranged wood, this new *mashrabiyya* will facilitate evapo-transpiration and reduce the accumulation of dust. In addition, the mullions are fixed without glue or nails thus allowing the *mashrabiyya* to flex with temperature changes.

5. Merits of the New *Mashrabiyya*

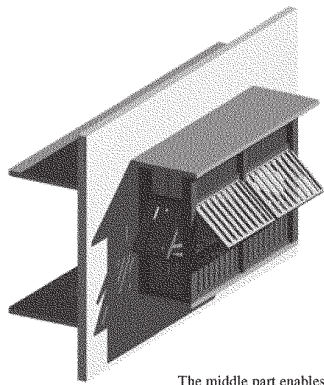
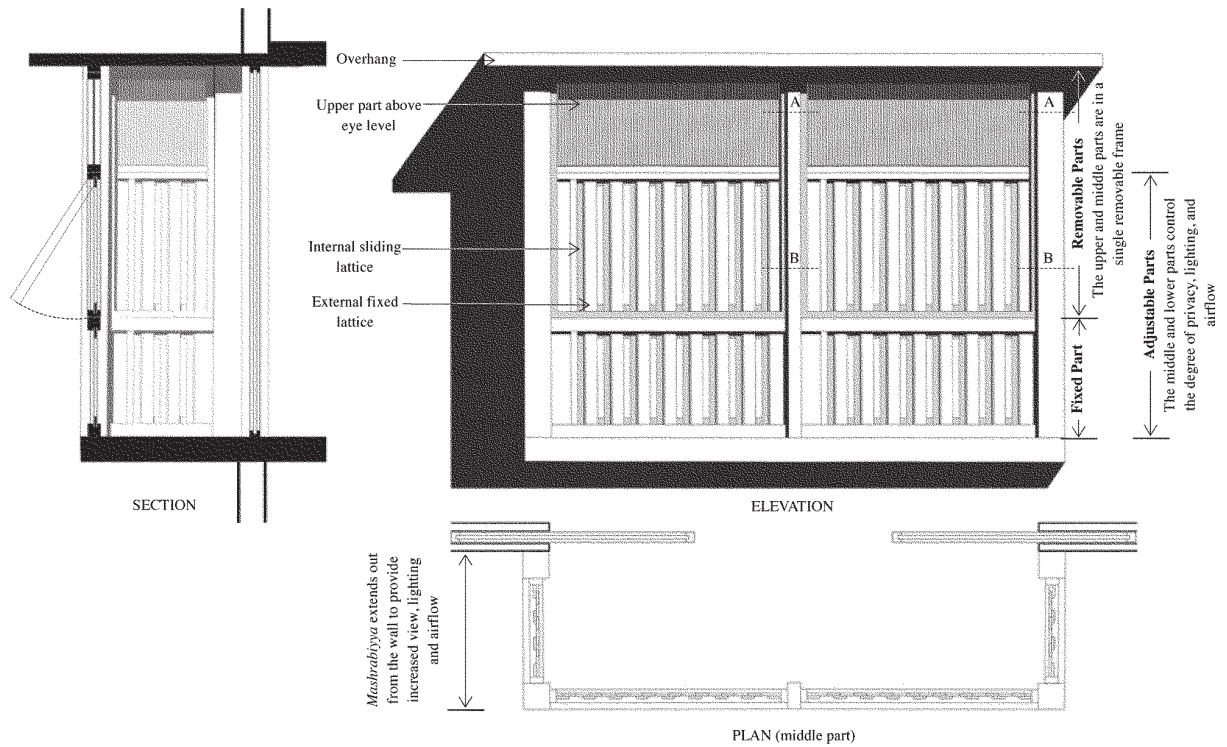
Considering the population density of Cairo and that the majority of families live in multi-story apartment buildings, the proposed *mashrabiyya* offers the following advantages over both the currently used devices and the traditional *mashrabiyya*:

- Unlike the *sheesh* which blocks the direct sunrays and insures privacy but conflicts with the needed air, lighting, and view, the proposed *mashrabiyya* provides all these while shading from sunrays and maintaining privacy.
- Unlike the modern balcony on which a woman has to put on her veil each time, the proposed *mashrabiyya* allows her to unveil while doing her daily outdoor activities.
- In consideration of the *shari'a* (Islamic law), this proposed design maintains privacy while improving airflow and lighting through the upper latticework. The rules in the *shari'a*, which in Islamic periods stipulated the height of houses and the size and location of openings relative to the surrounding buildings, insured that the upper lattice of the traditional *mashrabiyya* would improve airflow and lighting while maintaining privacy. However, privacy considerations are no longer followed in modern building codes. Accordingly, the proposal treats the upper latticework in a way that harmonizes environmental and social needs.
- It is adaptable to various degrees of privacy required in today's society. And it can even be transformed from an interior space into an open balcony making it suitable for social events held at home.
- It is made of vertical slats with neither horizontal surfaces nor corners to reduce its corrosion by pollutants and to be easily maintained.
- It is simplified in a way that makes it easier to construct and more affordable than the traditional *mashrabiyya*.

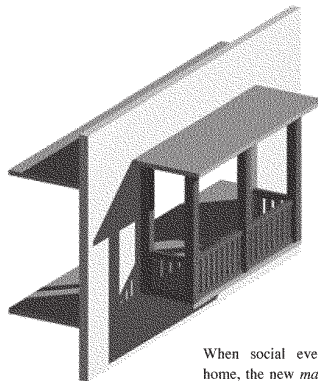
6. Conclusion

This paper offers a preliminary proposal for latticework derived from the traditional Islamic *mashrabiyya* and Japanese *machiya-gōshi* to be applied to the apartment buildings of contemporary Cairo.

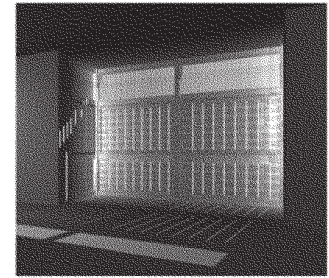
This new *mashrabiyya* is an affordable device that



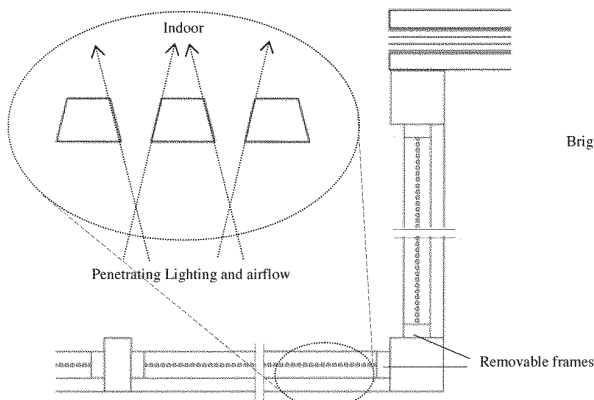
The middle part enables outdoor activities while veiling women.



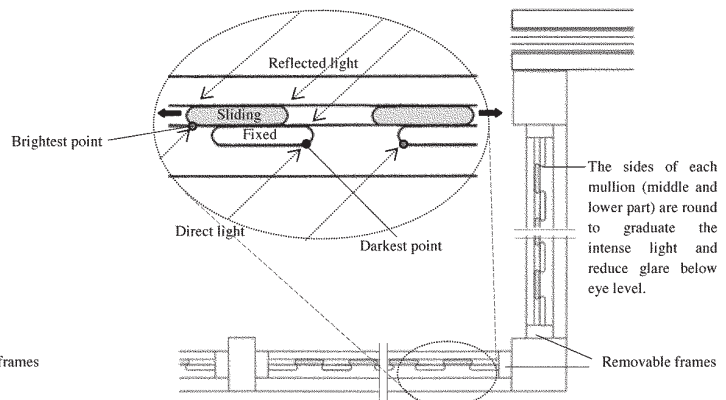
When social events are held at home, the new *mashrabiyya* can be opened by removing the frames.



When privacy and light intensity require closing the intervals below eye level, the upper part will compensate for the reduction in lighting and airflow without decreasing privacy from the surrounding buildings (see A-A).



DETAILA-A: Plan of Upper Part



DETAIL B-B: Plan of Middle Part (when the intervals are closed)

Fig.14. Preliminary Proposal for a New *Mashrabiyya* in Cairo

offers a better alternative to the inadequate *sheesh* and balconies because it accounts for contemporary social needs and ameliorates the climatic conditions. It also enables one to adjust freely the degree of privacy,

airflow, and lighting.

In order to arrive to the appropriate measurements and materials for this new *mashrabiyya*, my future research will involve more detailed environmental

studies and careful study of the architectural design of Cairo's contemporary apartments (internal space, internal heights, structural systems, Egyptian building code, etc.)

Acknowledgement

I would like to express my deepest gratitude to Roderick I. Wilson (Stanford University) for editing and giving advice on the organization of this paper.

Notes

- ¹ Sims, D. (2003) The Case of Cairo, Egypt. Case Studies prepared for the UN Global Report 2003 on Human Settlements. London: The Development Planning Unit (DPU), University College London, 3. www.ucl.ac.uk/dpu-projects/Global_Report
- ² Yousri, M. and Aboul Atta, T.A. (1997) The Challenge of Urban Growth in Cairo. In Rakodi, C. (ed.) *The Urban Challenge in Africa*, Tokyo: United Nations University Press, p.21.
- ³ E1-Zanaty, F. and Way A.A. (2004) 2003 Egypt Interim Demographic and Health Survey (EIDHS). Cairo: Ministry of Health and Population, National Population Council, E1-Zanaty and Associates, and ORC Macro, pp.3-4.
- ⁴ GOPP (1983) *The Urban Development Plan, Year 2000: Greater Cairo Region*. Cairo: General Organization for Physical Planning, in Yousri, M. & Aboul Atta, T.A., op. cit., p.23.
- ⁵ Aziz S. et al. (2001) Residential Building Survey in Cairo and Alexandria. Cairo: Housing and Building Research Center.
- ⁶ Behrens-Abouseif, D. (1991) *Mashrabiyya*. In the *Encyclopedia of Islam* New Edition (hereafter E.I.), vol.6. Leiden: Brill E.J., p.718.
- ⁷ Ibid., p.717.
- ⁸ Kenzari, B. and Elsheshtawy, Y. (2003) The Ambiguous Veil: On Transparency, the *Mashrabiyya*, and Architecture. *Journal of Architectural Education*, 56 (4), p.22.
- ⁹ Behrens-Abouseif, D. (1991), op. cit., 719. About the history of the *mashrabiyya* see also Revault, J. (1988) *l'Architecture Domestique au Caire a l'Epoque Ottomane*. In *l'Habitat Traditionnel dans les Pays Musulmans autour de la Mediterranee* (hereafter H.T.), vol.1. Cairo: *Institut Francais d' Archeologie Orientale*, pp.56-58.
- ¹⁰ Behrens-Abouseif, D. (1990) *Note sur la Fonction de la Cour dans la Maison Moyenne du Caire Ottoman*. In H.T., vol.2, p.411.
- ¹¹ El Guindi, F. (1999) *Veil: Modesty, Privacy and Resistance*. Oxford: Berg, p.104.
- ¹² Behrenz-Abouseif, D. (1990), op. cit., 416. Revault, J. (1988) *Reflexions sur l'Architecture Domestique en Afrique du Nord et en Orient*, In H.T., vol.1, pp.319-320.
- ¹³ Behrenz-Abouseif, D. (1991), op. cit., p.718.
- ¹⁴ Abu-Lughod, J. (1971) *Cairo: 1001 Years of the City Victorious*. Princeton: Princeton University Press, p.94.
- ¹⁵ Fathy, H. (1986) *Vernacular Architecture: Principles and Examples with Reference to Hot Arid Climates*. Chicago: The University of Chicago Press, p.45.
- ¹⁶ The Research Centre for Islamic History, Art, and Culture in Istanbul.
- ¹⁷ See *Crafts in Traditional Islamic Architecture with Special Focus on Mashrabiyya and Stucco Colored Glass: Present State and Future Prospects* (2000). Proceedings of the international seminar held in Cairo, 3-9 December 1995 (hereafter CTIA). Istanbul: IRCICA.
- ¹⁸ Fathy, H., op. cit., pp.47-49.
- ¹⁹ El Guindi, F., op. cit., p.104.
- ²⁰ Chelhod, J. (1990) *Hidjab*. In E.I., vol.3, p.359.
- ²¹ El Guindi, F., op. cit., 104. Zuhur, S. (1992) *Revealing Reveiling: Islamic Gender Ideology in Contemporary Egypt*, New York: State University of New York Press, p.39.
- ²² Badran, M. (1988) *The Feminist Vision in the Writings of Three Turn-of-the-Century Egyptian Women*. *Bulletin (British Society of Middle Eastern Studies)*, 15 (1/2), p.12.
- ²³ Tucker, J.E. (1983) *Problems in the Historiography of Women in the Middle East: the Case of Nineteenth-Century Egypt*. *International Journal of Middle East Studies*, 15 (3), p.330.

- ²⁴ Prisse d'Avennes, E. (1983) *Arab Art as Seen through the Monuments of Cairo from the 7th Century to the 18th*. Translated by Erythraspis, J.I. London: Al Saqi Books, p.186.
- ²⁵ Lane, E.W. (1908) *Manners and Customs of the Modern Egyptians*. New York: Dutton, p.506.
- ²⁶ Fathy, H., op. cit., pp.48-49.
- ²⁷ For further information, see Fernandes, L. (1990) *Habitat et Prescriptions Legales*. In H.T., vol. 2, pp.419-426.
- ²⁸ For further information about the history of veil in Cairo and Egypt, see Tucker, J.E., op. cit.; Zuhur, S., op. cit.; Macleod, A.E. (1991) *Accommodating Protest: Working Women, the New Veiling, and Change in Cairo*, Cairo: The American University in Cairo Press; Macleod, A.E. (1992) *Hegemonic Relations and Gender Resistance: the New Veiling as Accommodating Protest in Cairo*, *Signs*, 17 (3), pp.533-557; Mule, P. and Barthel, D. (1992) *The Return to the Veil: Individual Autonomy vs. Social Esteem*, *Sociological Forum*, 7 (2), pp.323-332; Badran, op. cit., pp.11-20.
- ²⁹ Ahmed, L. (1992) *Women and Gender in Islam: Historical Roots of a Modern Debate*, London: Yale University Press; Zuhur, S., op. cit.; El Guindi, F., op. cit.; Mule, P. and Barthel, D., op. cit.; Hoffman-Ladd, V.J. (1987) *Polemics in Modesty and Segregation in Contemporary Egypt*. *International Journal of Middle East Studies*, 19 (1), pp.23-50; Macleod, A.E. (1991), op. cit.; Werner, K. (1997) *Between Westernization and the Veil: Contemporary Lifestyles of Women in Cairo*, Bielefeld: transcript Verlag.
- ³⁰ Prisses d'Avennes, E., op. cit., p.256.
- ³¹ No available information about air conditioners in the 2000 EIDHS. See E1-Zanaty, F. and Way A.A. (2001) 2000 EIDHS, pp.22-23; E1-Zanaty, F. and Way A.A. (2004) 2003 EIDHS, op. cit., pp.9-10.
- ³² Rona, N. (2004) *Solar Air-Conditioning Systems*. Göteborg: Chalmers University of Technology, p.1.
- ³³ The highest temperature is 43° C with an avg. of 26° C. ASHRAE (2001) *International Weather for Energy Calculations IWEC Weather Files* User Manual and CD-ROM. Atlanta: ASHRAE.
- ³⁴ For its environmental functions see Fathy, H., op. cit., pp.47-49.
- ³⁵ Behrenz-Abouseif, D. (1991), op. cit., p.718.
- ³⁶ *Air Pollution in the World's Mega-cities*, Report from United Nations Environment Programme and World Health Organization (1992). Blackwell Publishing, pp.10-11.
- ³⁷ Abdel Hadi, M. (2000) *Wad' al Mashrabiyya*. In CTIA, p.160.
- ³⁸ Spencer, J. (1992) *Mashrabiyya: an Architectural Language*. *Journal of Arts and the Islamic World*, p.21, p.52.
- ³⁹ For further information about the construction of a *mashrabiyya* see Maury, B. et al. (1983) *Palais et Maisons du Caire II Epoque Ottomane*. Paris: *Centre National de la Recherche Scientifique*, pp.354-359.
- ⁴⁰ Behrenz-Abouseif, D. (1991), op. cit., p.718. Spencer, J., op. cit., p.52.
- ⁴¹ Nagai, N. (1996) *Machiya no Kōshi*. In *Kōshi no Omote Gamae*. Kyoto: *Gakugei Shuppansha*, p.5.
- ⁴² Hiyuga, S. (1988) *Monogatari mono no kenchikushi: Mado no Hanashi*. Tokyo: *Kashima Shuppan kai*, p.13 and pp.101-102.
- ⁴³ Ando, K. (1997) *Fūdo to Kurashi no Katachi*. In *Mado: Nihon no Katachi*. Tokyo: *Itagarasu Kyōkai*, pp.100-101.
- ⁴⁴ Nakagawa, T. (2002) *Nohon no Ie*. Tokyo: *Toto Shuppan*, pp.59-62.
- ⁴⁵ Hiyuga, S., op. cit., p.102.
- ⁴⁶ Hiyuga, S., op. cit., p.102. *WafūKenchiku Shilizu5: Gaiheki no Ishō* (1999). Tokyo: *Kenchiku Shiryō Kenkyūsha*, p.22.
- ⁴⁷ Engel, H. (1964) *The Japanese House: a Tradition for Contemporary Architecture*. Tokyo: Charles E. Tuttle Co., pp.154-155. Hiyuga, S. (1997) *Nihon no Mado*. Kyoto: *Tankōsha*, p.46.
- ⁴⁸ Hiyuga, S. (1988), op. cit., p.90. *Encyclopedia of Architecture and Building (Kenchiku Daijiten)* (1993). 2nd ed. Tokyo: *Shōkokusha*, p.575.
- ⁴⁹ Hiyuga, S. (1988), op. cit., p.91; Nagai, N., op. cit., p.7.
- ⁵⁰ Nishihara, K. (1968) *Japanese Houses: Patterns for Living*. Tokyo: Japan Publications, Inc., p.83.
- ⁵¹ They are inserted without glue or nails in order to better withstand earthquakes and typhoons, see *Mokuzō no Shōsai: 4 Tategu Zō sakuhen* (1968). *Shōkokusha*, p.10, p.39, pp.54-55.