

The research of the field trip to Cambridge University

**Solving the Problems of Small Housing
in High Density Complex Urban Area
with Building Technology**

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1.Introduction

(a)Research motivation

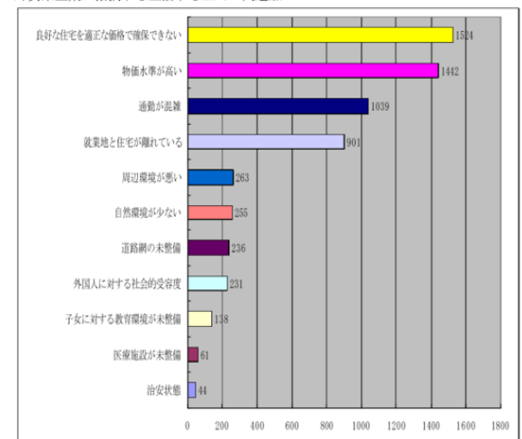
People spend most of their life time in their own house. It is considered that the environment in the house has a great influence on the human health. The lifestyle usually changes as the time passes, recent developments in IT and other industries is impressive. The environment surrounding us is rapidly changing.

Especially in the city area, introducing advanced technologies is done and a new market is being created. It can be said that more and more people are gathering to work there and valuable secondary and tertiary industries grow rapidly in the multiple effect. It is true that space for each house is becoming smaller in the overcrowded city area the past few years, the greatest concern is how to make a comfortable space for residents in such a small house. This paper suggests the way to have the light and wind, how to protect privacy, and the way to use space effectively.

(b)Current status and issues

There is a bad point in the high-density complex city area that there are many buildings. It is difficult to secure enough open space and evacuation routes. In order to secure space, the premises of many houses should be narrow, and the number of small houses is increasing. In addition, the rising land prices in urban areas may also contribute to the increase in the number of small housing. The issue is how to improve the convenience of small houses and create the environment in which the residents are able to live a healthy life mentally and physically.

外資系企業が指摘する生活する上での問題点



出典：平成6年東京都による外資系企業に対するアンケート調査より

2.Fundamental

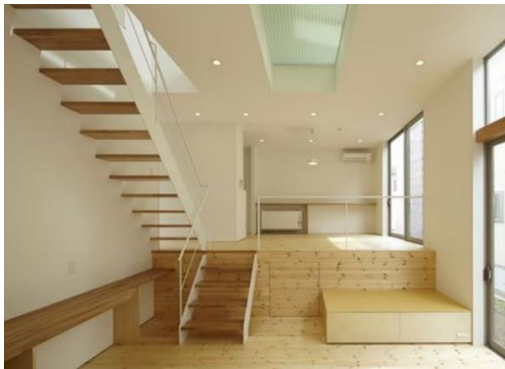
・Compact city :The compact city or city of short distances is an urban planning and urban design concept, which promotes relatively high residential density with mixed land uses. It is based on an efficient public transport system and has an urban layout which – according to its advocates – encourages walking and cycling, low energy consumption and reduced pollution. A large resident population provides opportunities for social interaction as well as a feeling of safety in numbers and "eyes on the street". It is also arguably a more sustainable urban settlement type than urban sprawl because it is less dependent on the car, requiring less (and cheaper per capita) infrastructure provision (Williams 2000, cited in Dempsey 2010)

・Small house :A type of Japanese house. A small house built on a small land. Although there is no clear definition, a house built on land less than about 50m² is generally referred to as such.

・Skip floor :A structure in which a part of the floor of a building has a height-changed part.(建築用語大辞典) (figure2/ figure3)

・Patio :Patio means a courtyard or backyard in Spain. In recent condominiums and single-family homes, a garden that is set up surrounded by buildings is called a patio. It is separated from the road side, making it a private space that is invisible to the public. Even in single-family homes, there is a method of effectively capturing light and wind by arranging a patio, which is used not only when there is enough room, but also in small homes and other small houses. (家とインテリアの用語がわかる辞典)

・Restriction on The Area of Housing Site in Tokyo :“There is a movement to improve the urban landscape of Tokyo called ”minimum site area” and ”maximum limit altitude district (absolute height)”, and to prevent mini-development, etc. and it has already been designated as a whole area in Tokyo except for some special areas. For example, in the case of Nakano-ward, there is a provision where the site area is 60 m².”(2014/8/2 株式会社 LIFULL LIFULL HOME’S PRESS 編集部)



(figure2)



(figure3)

(the example of skip floor;<http://www.daisan-kk.co.jp/modeplus/index1.html>)

3. Methodology

- 1)field survey at Cambridge City in England.
- 2) the following information was gathered in an engineering class.



Class of engineering

Hypotheses

It is assumed that the number of families living in one household is about 3 to 5 in the recent nuclear family. It is better for families with children to have a children’s room. Considering the layout of the house for families to live, 3LDK is ideal.

Although a method of increasing the number of floors by lowering the ceiling height in order to ensure as many rooms as possible in a narrow space is conceivable, it is not preferable because heavy equipment is difficult to enter during construction in the residential dense area will be high.

Therefore, it is not a good idea to simply increase the number of floors. With regard to the idea of making a basement, I think that it is a useful means if it is to build a room of the kind that the lighting and the ventilation are not special necessary in the basement.

In addition, it is important to design with light and ventilation in mind in creating a comfortable space, but I think that it is effective to devise a way to create a courtyard or use a large window.

Research question

- ① How can lighting and ventilation be more efficient?
- ② What device can make space wider?
- ③ How can privacy be protected?

If you cover then house with an outer wall to protect privacy, you will feel a sense of pressure and rather narrow. On the other hand, privacy becomes a bigger concern when using large windows to prioritize lighting and ventilation.

4.Result

Q①: How can lighting and ventilation be more efficient?

A①: Two solutions about lighting and ventilation were found. One is to put a window higher than the line of sight; another is to put a courtyard. It also leads to protecting privacy, but because the living space becomes narrow, it is important to design with an efficient flow line. In addition, by putting a courtyard, it is possible to get sunlight into the housing more effectively, rather than by putting a yard outside. There are many structures which have a courtyard, and have big window which make the house lighter. (figure4/figure5)



(figure4)



(figure5)

Q②: What device can make space wider?

A②: In order to make the space feel larger, it turned out that optical illusion, such as skip floor, removing a wall and atrium is effective. Eliminating the corridor removes wasted space and creates an efficient flow line. In many housing in London and most shops in Cambridge city, they have basements. Especially in the housings in London, most of them are semi-basements, so windows on it make it possible to get sunlight.

Q③: How can privacy be protected?

A③: As for the guard of privacy, lattice and some plants instead of blocking the gaze from outside. Buildings in London and Cambridge were designed to shut out the view of the city without compromising the beautiful scenery of the city.

7.Discussion

My initial thought was making residential space narrower, such as the courtyard and the atrium, is really effective, but there are more merits in living comfortably in a small house. To keep the privacy with a wall, it seems that using plants can not only block the line of sight from the outside but bring nature in.

From the point of view of the barrier free, it would be okay to introduce a skip floor in Japan, where the population is aging, but it turned out to be safer to make stairs with fewer steps. By removing the walls as much as possible, it was able to secure a smoother movement line and use the space efficiently. Considering the basement is used in a general household, the design can be applied into Japanese houses.

A similar twist was found in European countries other than the UK, and found that Spanish houses had a courtyard called a patio. This is thought to be a device to adopt a lot of light of the day more efficiently because the latitude is high and the daylight time is short as a feature of the climate of Europe. Since Japan is located at almost the same latitude as Spain, this device should be easy to actually adopt.

8.Conclision

There are some aspects to consider about how to make use of the ingenuity about how people see in the narrow houses in England. It is necessary to touch on the decisive difference between Japan and Britain. The biggest difference is the nature of the continent in which it is located. Britain is on a stable continent, so there are few earthquakes and many old brick houses. In contrast, Japan is located in the Pacific Rim, there are many earthquakes, and it is characterized by its relatively short life span of the house. For this reason, there are many used houses in the United Kingdom, while and new houses in Japan. It seems that it is difficult to change the shape of the original house though it is possible to renovate the used houses. It is easy to make a comfortable space for the person who lives more in the construction of the small house in Japan where there are a lot of newly built houses in that respect.

The device has to be made a comfortable space to live in these narrow floor plans can be used not only in the small house of Japan but also in many scenes in the future. For example, it is the International Space Station. My hope is to be related to manned space development such as the International Space Station in the future. It is very important to create a space where people can stay in outer space so that they can spend their time in comfort and body. Since the demand for small houses is expected to increase in the future, it is essential to create a comfortable living space in a small house. This research result would be applied to design another structure in a limited space.

9.Reference

我謝 和征, 鈴木 広隆, 池川 和臣 2002 年 36 卷 Supplement 号 p. 29-32

狭小住宅における室内空間の広がりや吹抜けとの関係についての研究

—可視連結係数を用いた空間の視覚的つながりに関する検討—

鈴木 隆

近代の中庭型都市共同住宅家屋の建築特性：

十九世紀前半のパリの中層・高密度市街地の成立に関する都市計画的な研究(6)

ジャーナル フリー 1994 年 59 巻 455 号 p. 137-147

野村陽子, 寺内美紀子, 坂本一成, 足立真, 小川次郎, 中井邦夫 1998. pp551-552

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