

THE DEVELOPMENT OF PLANS FOR BUILT-IN  
STORAGE IN KOREAN APARTMENT  
BUILDINGS

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1966

Submitted to the Faculty of the  
Graduate College of the  
Oklahoma State University  
in partial fulfillment of  
the requirements for  
the Degree of  
MASTER OF SCIENCE  
July, 1968

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THE DEVELOPMENT OF PLANS FOR BUILT-IN  
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## PREFACE

This study was planned to suggest ideas for better storage facilities which have been adopted in the United States so that they can be applied in Korea. It is hoped that the findings of this study will be used to encourage the use of built-in storage and to raise the standard of living by providing better storage facilities in Korean homes.

The writer wishes to express her most sincere gratitude to Mrs. C. F. Salmon, Associate Professor in Housing and Interior Design, for her competent guidance, helpful suggestions, and encouragement throughout this study.

Indebtedness is also acknowledged to Miss Leevera Pepin, Assistant Professor in Housing and Interior Design, and Mr. Milton Paschall, Assistant Professor in Housing and Interior Design, for their contributions as members of the advisory committee.

The writer wishes to express special and personal appreciation to her family for their constant encouragement and understanding.

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## CHAPTER I

### INTRODUCTION

#### Background

Korean families live in a type of house unchanged for many years in design, construction, and choice of material. For storage they use a "Da-lak", a type of attic built above the kitchen and adjacent to the master bedroom. Koreans use this for the storage of miscellaneous things such as dried fish or vegetables for winter, books and bedding which are also seldom used are kept here. It is very inconvenient to go up to the "Da-lak" because of the steps required to get to it.

They also have in the bedroom a "Jang-nong", a free standing wardrobe mainly for bedding, folded Korean dress and underwear. Nowadays, another unit for hanging garments is combined with this main piece. A "Jang-nong" is very important in a bedroom not only as storage but also as decoration. Korean people, like the Japanese, sit on the floor and use "Yi-bool", a Korean bed sheet, and a "Yo", a Korean mattress made of thick cotton and covered with fabric, in place of a bed. They use them only while sleeping, and fold them and put them into the "Jang-nong"



or "Da-lak" in the morning. Therefore, special storage space for bedding and cushions is very important in the bedroom of the Korean home which has no furniture like beds, chests or tables as Western countries have.

The "Jang-nong" is usually made of lacquered wood, and some are decorated with inlays of shells. Despite the high cost, it is a Korean custom that a bride is supposed to bring a "Jang-nong" as a dowry.

When a family decides to move, it is essential to have extra help, which is undue expense, because of the size of this storage unit. This is a fact which people cannot ignore in Korea where mobility is increasing; it is senseless to have to transport such large volumes of enclosed space from one home to another.

Besides, it is not easy to place a "Jang-nong" in a bedroom and obtain a pleasing arrangement. The writer has often heard complaints about the inadequacy and inconvenience of Korean storage, and feels that it is an urgent problem which needs immediate attention.

Koreans, however, are more tradition-bound than Western people. The Koreans live in their houses of ancient style, reminiscent of the feudal times, although most urban men and women work in offices or study at universities, which are built in Western style.

Presently, the Republic of Korea is facing serious housing problems, as are many developing countries, due to the increased demand for urban housing accompanied by

financial shortages. The housing demand is increasing by about 200,000 units a year due to the 2.7 per cent increase of population. For example, in Seoul the housing problem is becoming more acute because of the rural-urban migration, which is increasing by eight per cent a year. The government has built and is building public apartments, providing housing lots, and mobilizing private investors to build hundreds of units of downtown apartments, some with stores, in several localities.<sup>1</sup>

The Korean Housing Corporation is contributing to the solving of the housing shortage by providing thousands of apartments and housing lots every year. Most of them are built in a modified Western-Korean style which shows tremendous improvements in the house plan.

Storage, however, in the home and apartment building is an aspect of housing which has not been given sufficient consideration. Especially, Mapo apartments in Seoul, built in 1963 and 1964, have no consideration of storage space at all. This is really a big problem of modern homemakers in these apartments. Therefore, well-planned built-in storage, which is more economical and convenient in apartment living, is desirable so that closet space will meet individual needs of convenience, orderliness, and the conservation of time and energy.

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<sup>1</sup>"Housing and Building Materials in Korea," The Report of the Delegation of the Republic of Korea (Seoul, Korea, November, 1967), p. 3.

Contrary to housing, great changes in Korean customs have been taking place since 1945, and especially since 1950, after the Korean War.<sup>2</sup> Young women and men in large cities wear Western clothes, but the older generation still generally wear Korean dress which must be folded when stored. The urban men also wear Korean clothes when at home or on holidays. Thus, the storage arrangement in Korean apartments must be planned with special consideration of space for bedding and Korean and Western clothes. Space for luggage by apartment dwellers must also be considered.

In spite of the several problems above mentioned, little attention or research effort have been given to housing in Korea, even in the newest houses and apartments, for improving storage facilities and over-all room design and arrangement. The aim of this study is to show how built-in storage can be developed in the master bedroom for efficient space utilization and easier living. Also, this research may assist educators who are planning professional education in Home Economics and Applied Arts, and for homemakers who are eager to live in houses which have well designed built-in storage.

Further, this study should offer helpful suggestions to the house and apartment builders who want to get ideas

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<sup>2</sup>Bok Cha Yoon, "Identifying Problems in Korean Kitchen Designs With Implications for Improvements" (unpub. Master's thesis, University of Georgia, 1963), p. 1.

for improving storage facilities adapted to the habits and customs of the Korean people.

### Purposes

The purposes of this study are defined as follows:

(1) To recommend plans for built-in storage in the master bedroom of Mapo apartments which can be used in remodeling and applied in planning future Korean urban apartments and small houses, (2) To emphasize the necessity and convenience of built-in storage, (3) To suggest ideas for better storage facilities, adapted to the habits and customs of the Korean people, to homemakers and educators in the field of Home Economics and Applied Arts.

### Procedure

The procedures of this study will be: (1) Review the literature, (2) Obtain material from mobile home manufacturers to get information about built-in storage in small houses, (3) Discuss with Oklahoma State University Home Management Specialists the materials about storage used with staff and local leaders, (4) Observe the built-in storage in the American homes in Stillwater, Oklahoma, (5) Select a floor plan from Mapo apartments built by Korean Housing Corporation in 1963 and 1964 and develop a plan for built-in storage in the master bedroom, recommending several types.

## CHAPTER II

### REVIEW OF LITERATURE

Having enough storage space for the many items owned by families is as important to domestic tranquility as having enough space for living. Indeed, having storage space and using it correctly is the equivalent of adding to the living space of the home.

The need for storage space, especially for built-in rod closets, was brought to light by the Southern Regional Housing Survey of 1948. The report of this survey showed that only one-fourth of the homes studied had as many as one built-in rod closet per bedroom and that more than one-third had no such closets. Recently built homes seemed no better off than older ones. After homemakers in the survey had been questioned about special features they would want in a house, they were asked, "What other features would you consider so important you wouldn't want to build a house without them?" To this question, 33 per cent of all homemakers, or 70 per cent of those who replied, mentioned storage features.

As an answer to the problem of storage space, storage walls were designed at the Auburn University Agricultural Experiment Station in 1952 and 1953. They were

placed in a small house and evaluated to find how well they served the needs of families for storage of various kinds, especially that for clothing. This evaluation was carried on from 1953 through 1961.<sup>1</sup>

By one of these methods, Kathryn Philson evaluated the need and adequacy of storage space. The original set of 13 units was designed to provide storage space for the clothing and other household items of a family of four. Over-all considerations for their design were:

1. Adaptability for assembly as partitions.
2. Interchangeability of units and of parts, for example, shelves.
3. Mobility.
4. Capacity for storing clothing and household items.
5. Visibility and accessibility of stored items.
6. Economy of space.
7. Incorporation of built-in features.<sup>2</sup>

The general plan for evaluation consisted of four phases. They are:

1. General evaluation of units by laboratory personnel.

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<sup>1</sup>A partial report of a study supported by funds provided by the Hatch Act (1955) and by State Research funds.

<sup>2</sup>Kathryn Philson, Storage Walls (Auburn University, Agricultural Experiment Station, Home Economics Research Departmental Series, No. 1 [June, 1963]), p. 6.

2. Space evaluation of clothing storage units by laboratory personnel.
3. General evaluation of clothing storage units by 20 homemakers.
4. Use-testing of units by families living in the laboratory house equipped with storage-walls, and families living in their own homes.

Space evaluation of these units was made by placing specified sets of garments in them and judging whether the units used were adequate for storing the garments of each set.

From the study, Philson reported that family members should be able to understand their needs better than anyone else. Persons who are able to design storage units know the requirements for structural parts. It is evident that some discussion and cooperation is needed in planning for space requirements of both the items to be stored and the structural parts of the unit itself. When a homemaker or other member gives dimensions, she should make clear whether allowance has been made for shelf thickness, reach-in space, or other components of each dimension. The designer needs to make sure what allowances are needed for the items stored and what space is available for the entire facility planned.<sup>3</sup>

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<sup>3</sup>Ibid., p. 8.

The few studies of storage space requirements which have been reported in the literature were based on local situations and the relation of these to the nationwide problems of rural families was not known. Studies made by Maud M. Wilson of the housing requirements of rural Oregon families were used in developing plans and dimensions for storage facilities suitable for Oregon farmhouses.<sup>4</sup>

In multi-story "T" shaped houses in Nebraska surveyed by Virginia Y. Trotter, the storage space was one of the most serious inadequacies observed. Many homemakers used one or more of the available bedrooms for storage.

The amount of storage space provided in closets and storage furniture was measured and totaled in square feet of floor space. In addition, each homemaker was asked if her storage space was adequate. Those women who did not believe they had adequate storage were asked in which rooms they would like more. Although a number of women expressed doubts that enough storage could ever be provided, indications from the tabulated results are that women with greater amounts of storage space tend to be more satisfied with their storage than the women with lesser amounts.<sup>5</sup>

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<sup>4</sup>Maud Wilson, Plans for Oregon Farm and Acreage Homes (Oregon State College, 1945).

<sup>5</sup>Virginia Y. Trotter, The Existing Space in Nebraska Multistory Tee Houses (University of Nebraska, College of Agriculture, The Agricultural Experiment Station, Research Bulletin, No. 186 [May, 1958]), p. 24.



In a study by Withrow and McKinney of Nebraska multi-story square farm houses, storage was also surveyed. Storage space was measured wherever possible. Where not possible, the space was estimated. Homemakers were asked where certain items were stored, so that the measurements could be specific.

Homemakers were asked if they desired more general household storage and, more specifically, if available space in different rooms was adequate. There seemed to be no positive relationship between the homemaker's desire for additional storage and insufficiency of present facilities. Only 56 homemakers desired more storage in the kitchen, although 66 presently had five feet or less of storage in this area.

Bedroom storage and bathroom storage were reported inadequate by 43 per cent of the homemakers. Most of the houses had minimum or adequate closet space in sleeping and dressing area. Storage space in sleeping and dressing area in only 30 houses was inadequate when the number of persons was considered.

Inadequacy of total storage, however, increased as the size of family increased. All but two households of four persons did not have storage considered minimum by the public health standards; no households of over four had adequate total storage space. In all, only 12

households had minimum or greater total storage space.<sup>6</sup>

A selected group of 87 homemakers of farm and nonfarm families near Newark, Delaware, were interviewed regarding their current practices in the choice and storage of bedroom and bathroom textiles. This study was reported by Drexel Institute of Technology in 1947.<sup>7</sup>

In a study reported by Purdue University in 1948, approximately 75 nonfarm families were sampled to ascertain the kinds of articles that they stored. Space dimensions and methods of storage were recommended.<sup>8</sup>

In another study on rod closets, Philson recommended the dimensions of closets and summarized the results of the study as follows:

The usefulness and adequacy of a closet depend to a great extent on correct dimensions. Depth, measured on the inside from front to back, should never be less than 24 inches. Depths of 24 to 28 inches are recommended for garments other than coats.

Height of the rod is determined by adding 6 inches to the height required by the longest garment. The length of the rod should be determined by the user's greatest expected need.

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<sup>6</sup>Jerre Lewis Withrow and Florence McKinney, The Existing Space in Nebraska Multistory Square Farm Houses (University of Nebraska, Research Bulletin, No. 187 [Jan., 1959]), pp. 34-37.

<sup>7</sup>M. L. Stallnecker, "A Study of Current Practices of a Selected Group of Homemakers in the Choice and Care of Bedroom and Bathroom Textiles" (unpub. Master's thesis, Drexel Institute of Technology, 1947).

<sup>8</sup>H. L. Marley, "A Study of Some Requirements of a Group of Indiana Families" (unpub. Master's thesis, Purdue University, 1948).

Shelving, hooks, and special racks in the rod closet add to its convenience by providing space for storing hats, shoes, ties, belts, and other items. Hinged doors provide space for some of these storage devices and permit the front of the closet to be opened fully.<sup>9</sup>

Philson also states that it is wise to plan bedroom closet space to meet the requirements of the person who is to use it. General rod length requirements are estimated on a lifetime basis. For homes with unassigned bedrooms, the rod allowance for the minimum level of ownership should be 3 to  $3\frac{1}{2}$  feet per person; for the moderate level, 4 to  $4\frac{1}{2}$  feet per person; and for the liberal level,  $4\frac{1}{2}$  to  $5\frac{1}{2}$  feet per person.<sup>10</sup>

A study about clothing storage conducted at the University of California describes the basic measurements for clothes storage:

Minimum inside depth . . . . .	24"
Minimum hang span (width) per person . . .	48"
Distance from floor to top of clothes rod	
Dresses and coats . . . . .	58"
Long garments . . . . .	70"
Men's trousers . . . . .	48"
Blouses, shirts, skirts . . . . .	38"
Distance from top of rod to shelf above. .	$2\frac{1}{2}$ "
Distance from rod to parallel wall . . . .	12"
Depth of shelves over rods . . . . .	15 to 17"

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<sup>9</sup>Kathryn Philson, Rod Closets for Southern Farm Houses (Auburn Univ., Agricultural Experiment Station Bulletin, No. 325 [March, 1960]), p. 18.

<sup>10</sup>Ibid., p. 19.

Distance between shelves for:

Hats . . . . .	9 to 10"
Shoes . . . . .	6 to 7"
Purses . . . . .	9 to 10" <sup>11</sup>

Storage space requirements for household textiles were studied by the U. S. Department of Agriculture - Agricultural Research Service. In the survey, they concluded that space to store limited supplies represents the minimum that should be provided for in farmhouse plans. Storage facilities that provide room for liberal supplies will meet the needs of a large portion of farm families.

Depths of surfaces are in multiples of a 4-inch module. The modular depths found satisfactory for the five classes of articles are as follows:

Bath linens	; 12 and 16"
Bed linens	; 12 and 16"
Bed Covers	; 16, 20, 24, and 28"
Kitchen linens	; 12, 16, and 20"
Table linens	; 16 and 20".

The width dimension is reported as a range. Any specific dimension for width that falls within the range can be adopted when a storage facility is planned. Because the upper limit of the range represents comparatively extravagant use of wall space, it is advised only for the unusual situation.

Between-shelf spacings, which include a clearance needed to place or remove the textiles from the shelf, are indicated for fixed and movable surfaces. More handling

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<sup>11</sup>Mildred Novotny, Clothing Storage (University of California, Agricultural Extension Service, 6/60 - 3000), p. 2.

room is needed above fixed shelves than above sliding shelves, drawers, and trays, since the latter can be drawn away from the confining shelves above. As a result, most storage facilities equipped with movable surfaces required 15 to 30 per cent less vertical space than do those with fixed shelves, all other dimensions remaining the same.<sup>12</sup>

A master's thesis written at the University of Tennessee in 1949 reported that among 57 farm families sampled in a small South Carolina community, the storage facilities most needed were for bedding, medicine, bed linen, and sewing equipment - in the order listed. The homemakers also gave their preferences regarding the types of storage facilities for bed linens they would want in a new house.<sup>13</sup>

In addition to the above mentioned studies, various pamphlets giving ideas on storage have been printed and published by universities and extension service specialists.

The planning of clothing storage has been studied and designed with ready-made storage features by Novotny at the University of California.<sup>14</sup>

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<sup>12</sup>Avis M. Woolrich et al., Storage Space Requirement for Household Textiles, U. S. Department of Agriculture - Agricultural Research Service, ARS 62-2 (Sept., 1955), p. 26.

<sup>13</sup>R. M. Craven, "A Study of Certain Storage Facilities in Selected Farm Homes as a Guide to Storage Needs" (unpub. Master's thesis, University of Tennessee, 1949).

<sup>14</sup>Novotny, Clothing Storage, pp. 1-8.

Space design for storage facilities in the bedroom, living room, and dining room areas were studied by Lucille Clark, Housing and Household Equipment Specialist, Oklahoma State University. Attic and stairway storage were also suggested.<sup>15</sup>

Additional authors and researchers have given various kinds of suggestions for closets for clothes and bedding with ideas of built-in storage for home improvement and for easier living.

Mary and Russel Wright show fine functional storage ideas with illustrations and describe the importance of good storage as follows:

Good, spacious closets can save much house work. Confining all that pertains to dress in a single well-organized area minimizes litter, and saves daily dusting and arranging of closets and bureaus.<sup>16</sup>

The Guide to Planning Storage published by Better Homes and Gardens also shows various ideas and suggestions: Space-saving ideas for every room, decorative units to store special items and "how-to" primer for built-in storage.<sup>17</sup>

Especially, Collani indicated the necessity of built-in storage for today's home. He revealed that despite the

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<sup>15</sup>Lucille Clark, Check Your Home for Storage Areas (Oklahoma State University, Series No. 7, L-952).

<sup>16</sup>Mary and Russel Wright, Guide to Easier Living (New York, 1954), p. 60.

<sup>17</sup>Guide to Planning Storage (Better Homes and Gardens, 1959).

need for built-ins, people seldom include them in new houses and, of course, they do not exist in most old houses. Providing built-in storage can give one an opportunity to solve his storage problems in a way that will best satisfy the individual tastes and needs.

He also describes the importance and the advantages of built-in storage. There is a definite relation between the high standard of living one enjoys and the growing importance and demand for built-in storage space. Labor-saving devices, both in industry and the home, have given people leisure and its attendant desire for the multitude of wonderful things that now fill the houses.

Whereas, in the past, men and women needed only work clothes and Sunday-go-to-meeting best; today they have a greatly extended wardrobe, including different costumes for various activities. The importance of built-in storage space has grown with the acquisition of all these articles that have given richness and color to lives.<sup>18</sup>

In a master's thesis, the built-in storage is intensified for its utilization. Closets that have been arranged so clothing is not easily accessible or have wasted space may be made more effective by utilizing the back of the door, and by adding or rearranging rods, shelves, and drawers. A space at the top of the closet may also offer a solution to the waste-space problem in closets with very

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<sup>18</sup>Arthur Collani, Built-in Cabinets and Storage Walls, (New York, 1956), p. 3.

high ceiling rooms. This space may contain articles which are seldom used such as luggage or extra bedding.<sup>19</sup>

Some storage devices were mentioned in textbooks and the principles of planning storage were indicated. Agan and Luchsinger describe the principles of storage:

1. Convenience for the worker; ease of access (near the activity it serves); maximum reachability and availability; maximum visibility; provisions for keeping the articles sorted.
2. Care of the articles stored: kept free of wrinkles (such as hung or folded clothes, table and bed linens); protected from airborne threats of dust, odors, and gas fumes (such as garments and silver protected against gas fumes); protected from sun-light (such as colors in garments and household furnishings), from molds (such as leather in damp climates), from adverse temperature (such as food and furs); protected from destructive pests such as moths, mice, flies, or ants.
3. Maximum utilization of space: little excess space, but enough for the articles to be stored with clearance at the sides to grasp

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<sup>19</sup>Elaine T. Barber, "A Study of Master Bedroom Storage in Rural Homes of Oklahoma" (unpub. Master's thesis, Oklahoma State University, 1949).



them and above to lift them; convenient holding devices to keep the articles sorted, such as drawers, bins, files, hooks for hanging, shelves.

4. Flexibility in use: adjustable heights of shelves; adjustable file dimensions; removable hooks.
5. Appearance of the room: orderliness desired.
6. Ease of maintenance in a clean and orderly condition.
7. Economy in cost: modular dimensions are widely used for economy of construction; simple and flexible arrangements are less costly to construct than complex and fixed.<sup>20</sup>

Usually, the articles stored have been followed by dimensions in the study. Kennedy specifically indicated the articles that should be stored in the clothes storage area for husband and wife.<sup>21</sup>

Helen McCullough, in a study reported in 1952, determined the amount of space needed to accommodate given number of various kinds of household articles, including

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<sup>20</sup>Tessie Agan and Elaine Luchsinger, The House-Principles/Resources/Dynamics (New York, 1965), pp. 120-121.

<sup>21</sup>Robert Woods Kennedy, The House and The Art of Its Design (New York, 1956), p. 261.

textiles. Minimum depths of storage units were recommended and designs for the units were developed.<sup>22</sup>

### Summary

The review of literature disclosed that investigations done on storage have been involved chiefly with rural homes. These investigations were concerned mostly with space adequacy, estimated amounts of storage, and dimensions of the articles to be stored.

Extensive requirements for more storage space has stimulated planning of storage units and built-in storage and there will be more and more need for storage in rural and urban homes and apartments. An assessment of present storage conditions indicates the necessity for careful planning by the user, the designer, and the builder to provide better conditions.

Storage units should be designed to provide for both the immediate and the long range future needs of the family. For instance, they should provide for differences in seasonal use and expected future needs of children for greater space for the same kinds of items. If the first use is a temporary one, provision should be made for other possible future uses of the units.

In making specifications for design of storage units,

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<sup>22</sup>H. E. McCullough, Space Design for Household Storage (University of Illinois, Agricultural Experiment Station Bulletin, No. 557 [August, 1952]).

if one expects the completed units to be functional, one must allow space for items stored, for reaching-in space, for cleaning space if needed, and for the structural parts of the unit itself.

Many of the findings from these studies of storage may be applicable to design of storage units in general, storage components, as well as storage walls or built-in storage.

## CHAPTER III

### PROPOSED STORAGE PLANS

#### Storage Problems in Mapo Apartment

The Mapo Apartment built in Seoul by the Korean Housing Corporation in 1963 and 1964 is a six-story building in which a family unit has a living room, two bedrooms, kitchen, balcony, and bathroom (Figure 1). It is built for middle class single families; the building built in 1963 has 48 family units, the one built in 1964 has 144 family units.<sup>1</sup>

The design of each dwelling unit has been considered well for space utilization and gives the feeling of a private home. However, storage has not been considered at all, and a family must have one "Jang-nong" at least and it seems that the disadvantages of the "Jang-nong" as mentioned in the introduction are ignored entirely.

In fact, the storage problems which most families are facing are the result of an increase in the volume of items to be stored without a proportionate increase in space. As the family grows and interests expand, so does the demand

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<sup>1</sup>The Current Conditions of Korean Housing, Korean Housing Corporation pub. (Seoul, 1966), pp. 138-139.

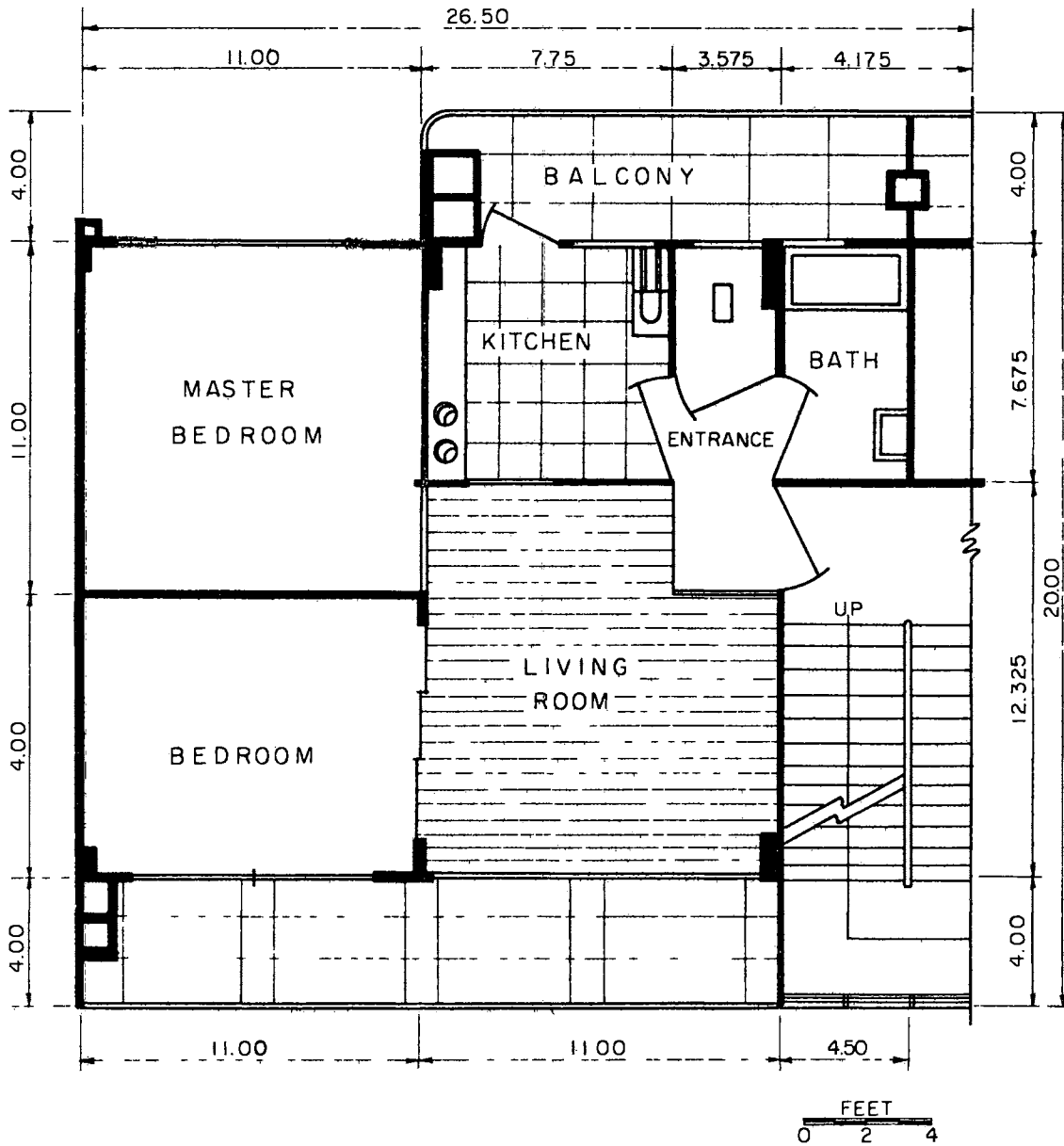


Figure 1. The Floor Plan of a Family Unit in Mapo Apartment Building

for storage.<sup>2</sup> In the Mapo Apartment, each unit has two bedrooms and the storage should be planned for the middle aged, middle class, single family which has one or two children.

Among the storage spaces often poorly planned are those for the sleeping and dressing areas in spite of the importance of each of these. As the master bedroom in the Mapo Apartment is not large, storage space should be kept to a minimum. Built-ins, with careful planning and arrangement, will help solve this dilemma.

#### Proposed Space Arrangements for Storage

The master bedroom (11' x 11' large, 8' high) is adjacent to another bedroom and the kitchen and has a door (3'3" x 7'0") and a window (6'0" x 3'6") (Figure 2).

In this small bedroom, the first thing which should be considered in planning storage is how to save space by finding appropriate locations and arrangements for the dressing and bedding units.

As Koreans continue to use the Korean mattress, "Yo", instead of a bed, it must be folded and put into the closet in the morning. Traffic lanes for the arrangement of the bedroom furniture are not such a serious problem as they are in Western bedrooms. The space allowance for

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<sup>2</sup>Sunset Ideas for Storage in Your Home by the editorial staff of Sunset books (Menlo Park, California, 1958), p. 4.

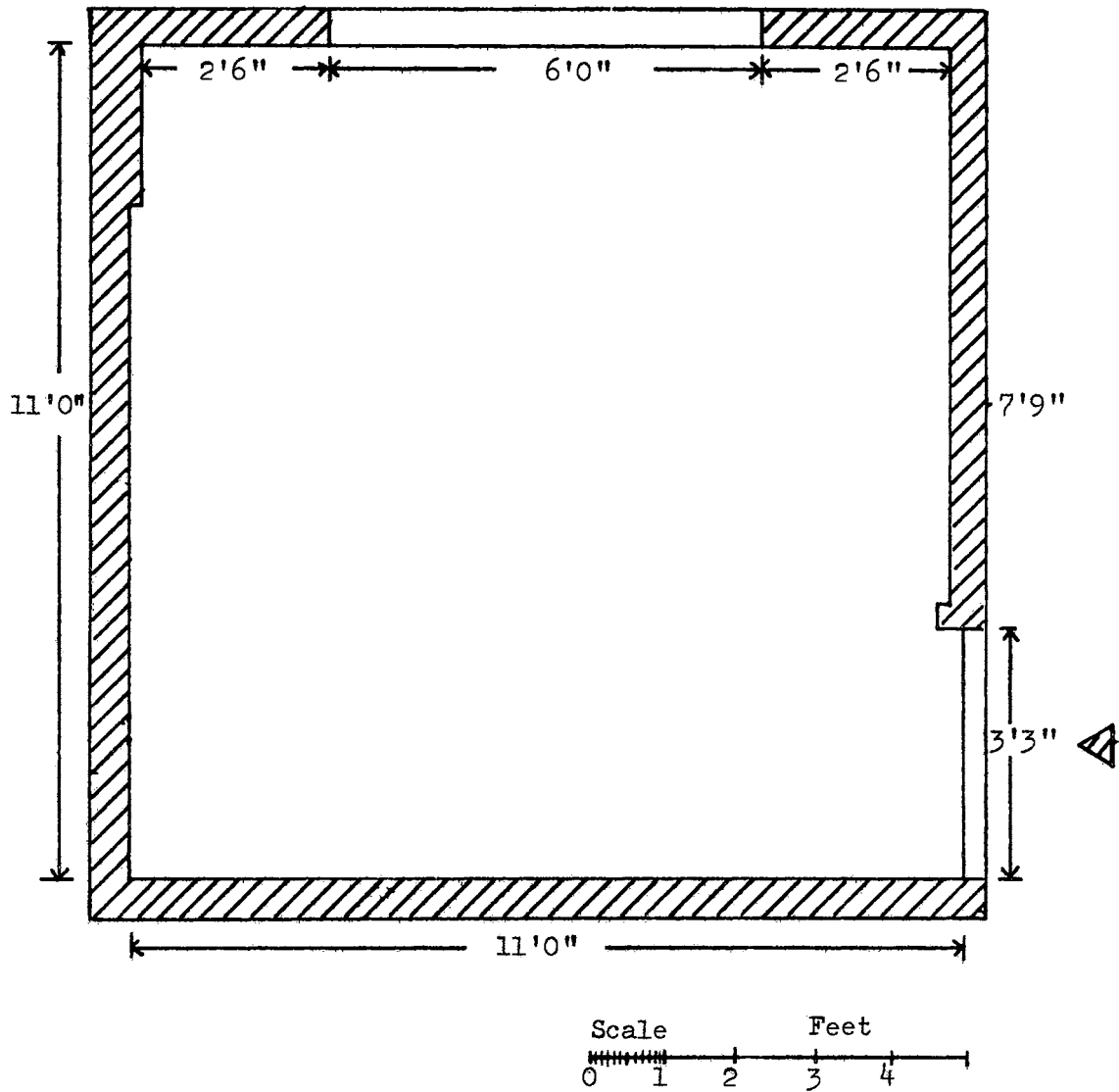


Figure 2. The Master Bedroom in Mapo Apartment

convenient use of closet and furniture do not have to be considered so seriously either because less space is needed for activities such as bed making, cleaning, and using the closet and dresser.

However, the space for "Yi-bool" and "Yo" should be designed carefully because Koreans use a unique heating system, the "On-dol". Each room has a stove under the floor and the heat comes through the floor. Coal is usually used for fuel. The Mapo Apartment is built with the "On-dol" heating system and the master bedroom has its stove in the adjacent kitchen. Therefore, the place close to the kitchen stove should be free for the use of the "Yi-bool" and "Yo" at sleeping time.

There are two types of bedroom closets: walk-in and reach-in. Walk-in closets require floor space that is unavailable for other uses and they cannot be recommended for moderate to small homes unless they happen to be advantageous in a particular house plan. Walk-in closets that have clothing rods on opposite walls should have 26" of free floor space for passage, which requires too much space for a small apartment.<sup>3</sup>

In this bedroom, the reach-in closet is desirable. The floors of "reach-in" closets should be built at least 2" higher than the floor of the room so that dust will not

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<sup>3</sup>Bedrooms and Clothes Closets, U. S. Department of Agriculture, House Planning Aids, Miscellaneous Publication No. 1004 (August, 1965), p. 4.



seep in so freely.<sup>4</sup> For accessibility, it also should have a full-front opening. Doors for full-front closet openings can be sliding, folding, accordion-type, or hinged.<sup>5</sup>

Basically, in a bedroom, the closet should be arranged to include drawers, shelves, dressing table with mirror and wardrobe space. Shelves and drawers in various sizes can be fitted into any or all of the three compartments in any combination. Any proportion of the space can be utilized for hanging garments.<sup>6</sup>

Bedrooms are divided into sleeping and dressing areas. When two people use a room, it is a good idea to divide the wardrobe so each has his own section. In the master bedroom, separate closets for husband and wife are desirable.

Where to find space for storage depends on the particular house and its windows, doors, and other design features. All areas out of traffic lanes and not being put to good use can be converted to some sort of storage; every unused wall is a potential storage wall or foundation for shelves or cabinets and the wall space below

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<sup>4</sup>Robert Scharff, Improve Your Home With Built-ins (New York, 1954), p. 201.

<sup>5</sup>Bedrooms and Clothes Closets, p. 4.

<sup>6</sup>Arthur Collani, Built-in Cabinets and Storage Walls (New York, 1956), pp. 44-45.

windows can be used for a low storage chest.<sup>7</sup>

With these considerations, four locations for storage spaces with different sizes and arrangements were found in the Mapo apartment bedroom.

### Plan 1

This plan is the best possibility for the combination of units of storage divided for husband and wife, with dressing table and mirror. The east wall would not provide enough storage for two people because a place for the use of "On-dol" must be located here.

Total rod length is designed for the moderate number of garments in this plan (husband 44", wife 54") and the depth is 28 inches for storing coats and Korean dresses. The height will be continuous to the ceiling to provide enough space for the items which are seldom used such as luggage. Twenty inches is adequate for the depth of the dresser, but it will be designed to be 24 inches deep to accommodate the storing of bedding materials.

The closets and dresser units will extend along the whole west wall of this room, but there remains enough space for the bedding during sleeping time and it will be possible to have a desk or table at the south side of the room as shown in Figure 3.

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<sup>7</sup>Sunset Ideas, p. 7.

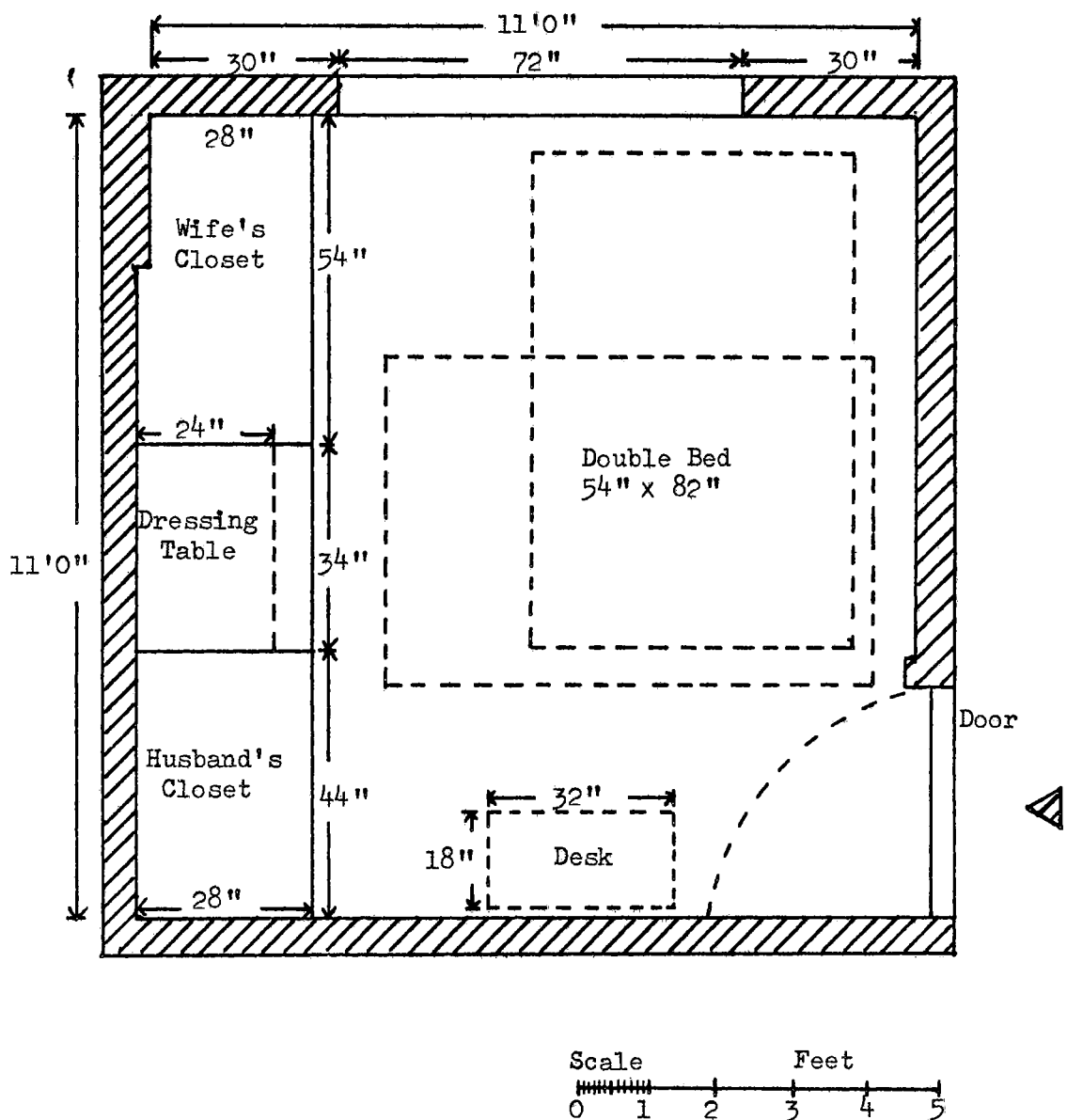


Figure 3. Plan 1

Plan 2

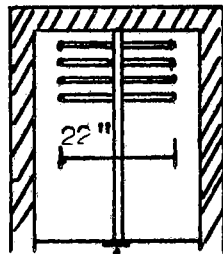
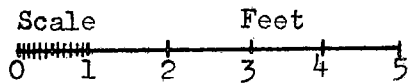
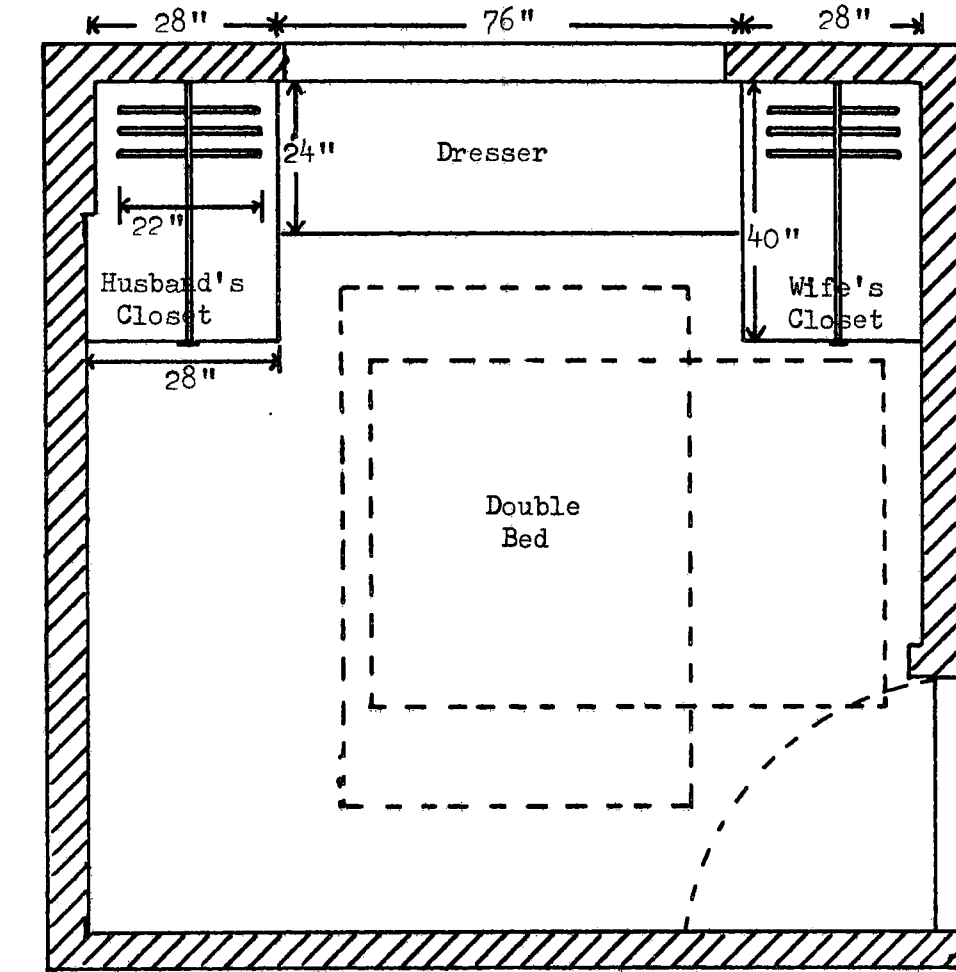
This plan shows closets which are designed as minimum separate units for husband and wife located in two corners of the room. A dressing table as well as dresser and chest of drawers for bedding are located under the window.

The width of this closet is 28 inches for coat storage and the depth is a minimum of 3'4" for the minimum number of garments.

Since the closet is narrow and deep, an extension device should be used so that the rod can be pulled out into the room. It is desirable to use a type similar to the clothes carrier illustrated in Figure 4. This gadget, consisting of a permanent track attached to the underside of the closet shelf, permits a movable arm to slide in and out on ball-bearing rollers. Instead of groping in a dark, narrow closet to find a particular garment, one can bring the wardrobe out into a well-lighted room by a slight pull on the handle.

The dresser is designed for bedding and folded garments. The mirror will be attached to the inside of the closet door because the window is already located above the dresser. It is desirable to place a flower arrangement or some other decorative items on the top of the dresser.

Even if the closet is very limited, this storage plan will give the most spacious feeling to the room (Figure 4).



Clothes Carrier Extended

Detail of Bracket

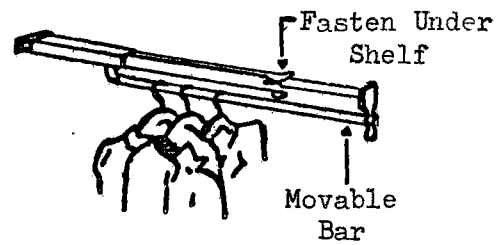


Figure 4. Plan 2

Plan 3

The idea of this plan was suggested from the double storage units on either side of a double bed in Western style bedrooms.

The length of the closet is minimized for the minimum number of garments (husband 27", wife 38½"). In this plan, a separate unit for folding garments and bedding would be provided and it could be placed along side of the man's closet. Generally, women need more closet space than men, but this storage space has been designed and used equally. Since the depth needed for folded garments is only 13", space is wasted when folded garment storage is placed inside the rod closet. The storage for bedding needs 24" depth at least, and here the lower part could be used for bedding and the upper part for folded garments. It is recommended that pull-out shelves, which save space and make the garments stored readily accessible, and adjustable shelves which are adaptable to changing needs be used. The top of the bedding storage could be used as a desk or for decorative objects in the room.

This plan is not very desirable for this room because the heat comes through part of wife's closet, but it still gives a spacious feeling to the room, and a new shelf idea for bedding and folded garments; it can be adopted for space utilization and convenience (Figure 5).

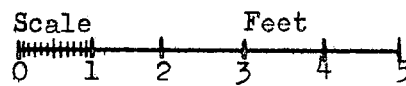
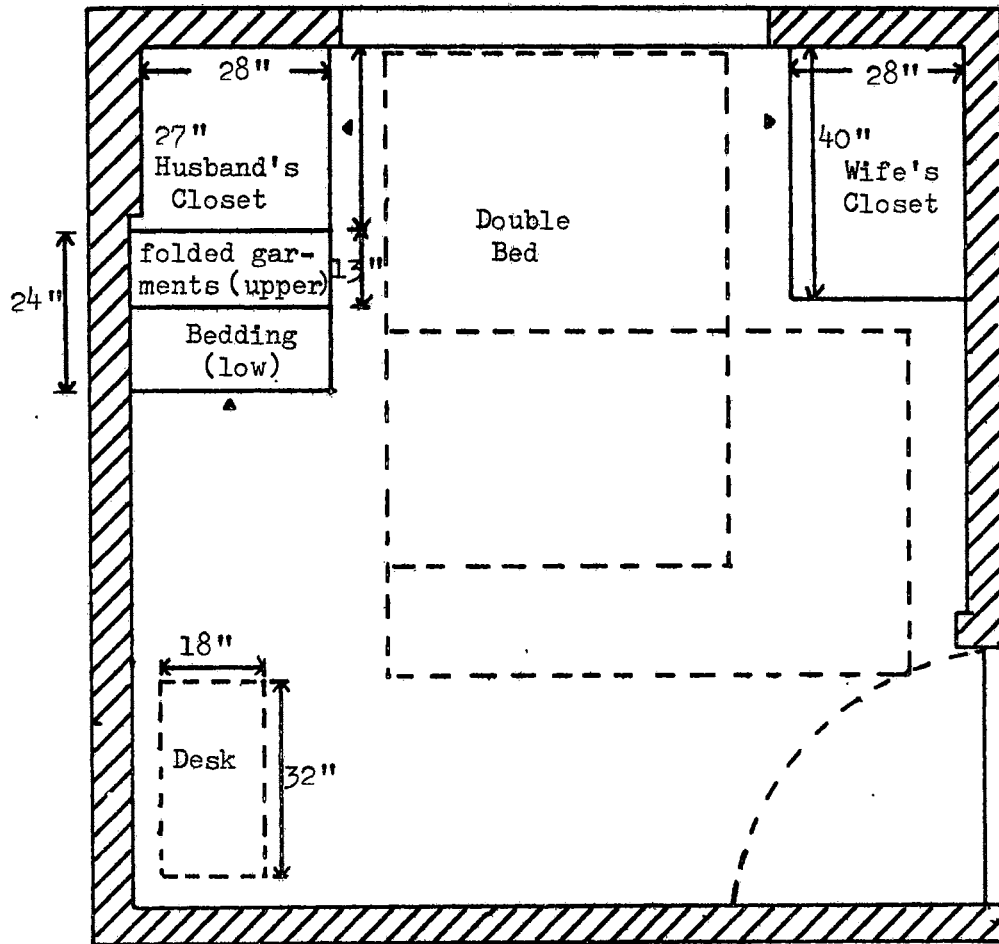


Figure 5. Plan 3

Plan 4

Another possibility for storage is the use of the wall on the south side. The whole length of the wall could not be used because space is required to swing the hinged door.

This closet plan could not be separated for husband and wife, but can be designed as an adequate size shared storage space including some trays and drawers inside. Another dressing table and bedding closet will be placed at the opposite corner.

Some people might not like this closet unit, but the space between dresser and closet can be utilized for a small desk or some decorations for the room.

This plan is combined with three units; a clothes closet shared by husband and wife, a dresser, and a bedding storage unit (Figure 6).

Each of the four plans has advantages and disadvantages, but since they are all possible plans which meet the storage needs at least in this small master bedroom, they can be selected by the taste and need of each family.

The writer, however, would recommend Plan 1 as the best plan for this room. This storage plan may make the room compact compared to other plans, but adequate storage facilities are as important as adequate living space. As it is also desirable to have a dresser and mirror in the master bedroom, this plan can give some idea of the



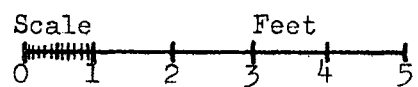
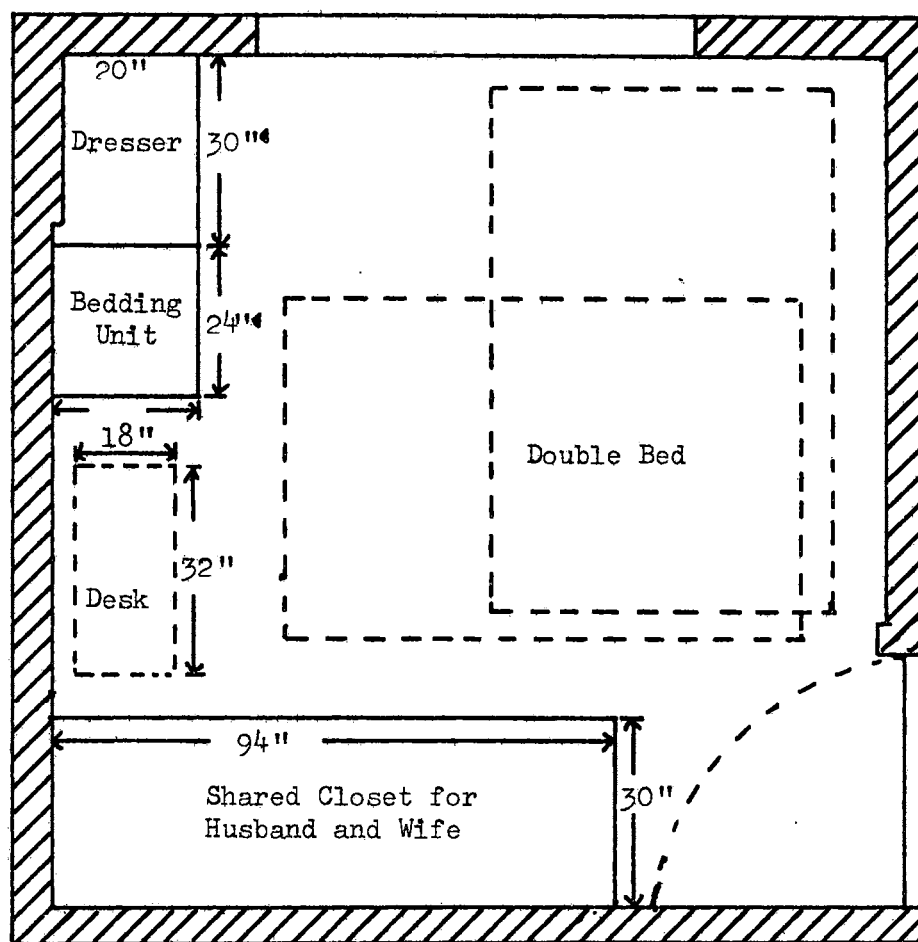


Figure 6. Plan 4

complexity of storage problems and may suggest ways of solving them in the bedroom.

Therefore, Plan 1 will be developed in the next section with specific dimensions and arrangements.

#### Development of Plan 1

The concept of planned storage means basically that storage units work to make life easier and more comfortable. This ideal situation is realized when the operation and maintenance of a home is simplified by use of storage that meets the specific needs of a family. The facilities are located strategically throughout the home, keeping possessions in good order and constantly at work simplifying chores, encouraging neatness, and providing ready accessibility to any of the items stored.

The result of this type of planning is a situation where closets and cabinets are more than just "places to put things." Outdated are catch-all closets and deep cabinets which seem designed to hide rather than serve. In their place have come functional units, adding to the design of the home and giving service to the art of living.

The key to storage by use is organization, both in location of units and their internal make-up. Tailoring closets and cabinets to accommodate all objects to be stored in them and also eliminating waste space is a complex process, but one that pays off in maximum use of living space.

Storage, like the rest of a house, is personal and an expression of one's talent and taste. The best storage is the volume and arrangement that contributes the most to making a family's living habits as pleasant as possible. For this reason, one should not approach the problems involved in terms of rigid imitation of what was done somewhere else; instead, the imagination and planning skill of one family should be used to work out a storage system that provides a practical solution to the particular needs of the family.<sup>8</sup>

In the apartment building, however, it is impossible to plan storage to meet the needs of each family because the living space is limited and various types of families move in and out.

Therefore, in planning storage for the Mapo Apartment, it would be desirable to consider general storage more economical and convenient in the apartment life which will be adapted to the habits and customs of Korean people (Figure 7).

#### Items and Dimensions

The first step in planning storage is to decide what is needed - what items are to be stored, and the amount of space necessary to accommodate them.

The items stored in the master bedroom are mostly

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<sup>8</sup>Sunset Ideas, p. 5.

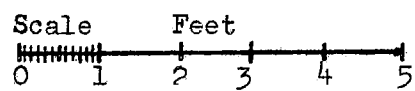
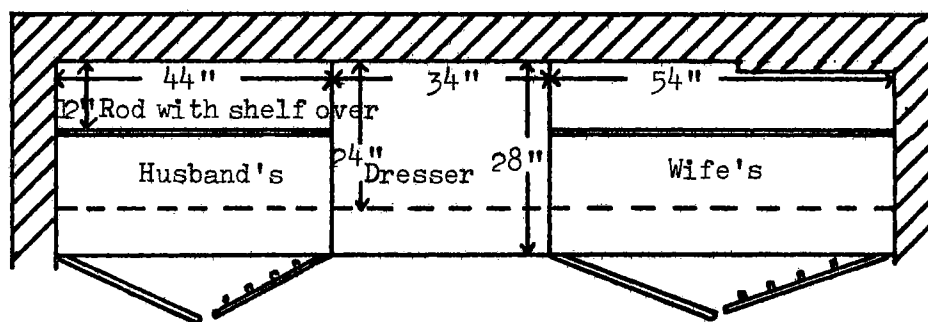


Figure 7. Detail of Storage, Plan 1

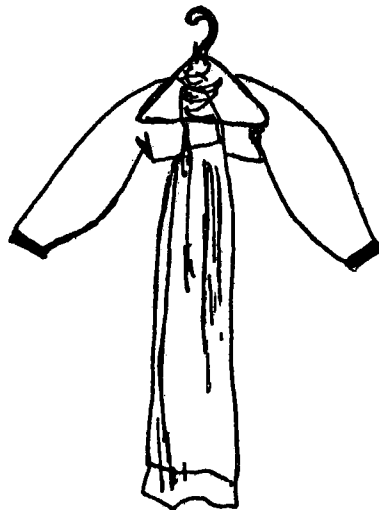
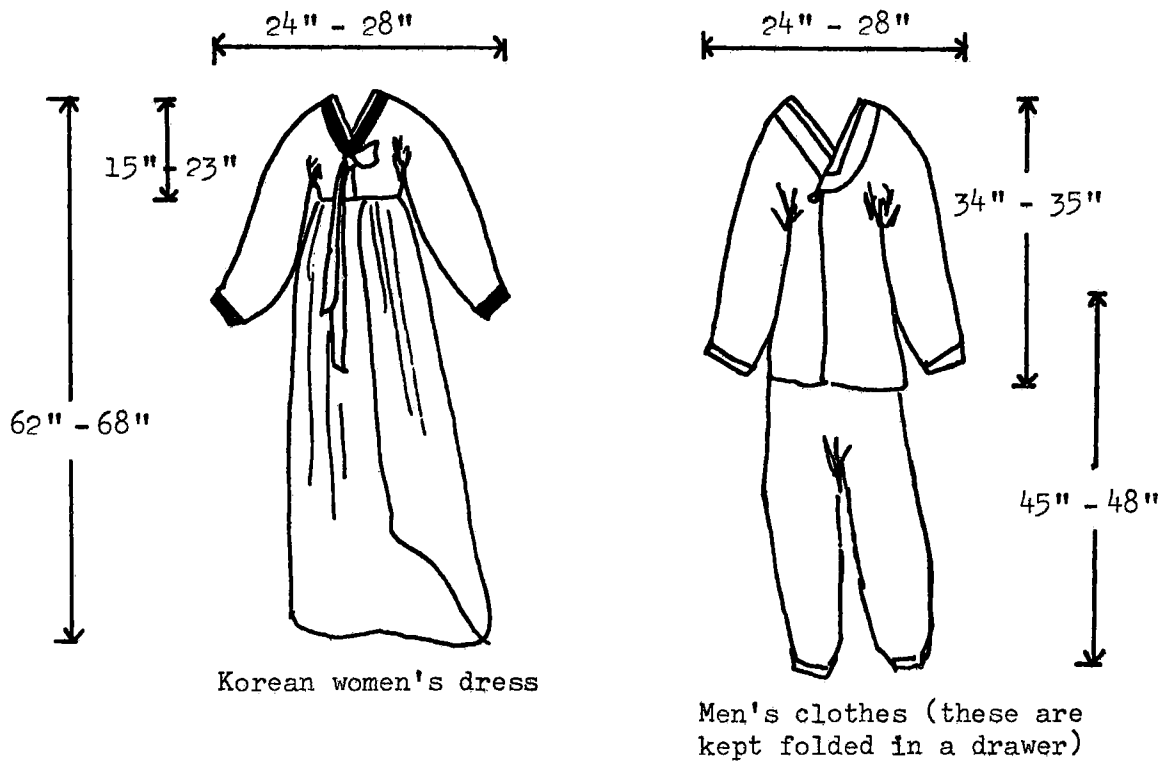
clothes for husband and wife. Usually, young women and men in large cities wear Western clothes, but married women still wear Korean dress which should be kept folded in the closet. Nowadays, for convenience, they hang some of them in the closet like Western dresses are hung. Clothes of Korean men have the same unique style, which combines the "Juh-go-li", the Korean word for a man's shirt or woman's blouse, and "Ba-ji". The sizes of them are almost the same as Western suits, but they are kept folded in the closet. Korean women's dress has the same unique style that combines the blouse, "Juh-go-li", with a wide skirt, "Chi-ma", which is as long as a Western full length evening dress (Figure 8).

Korean women do not generally wear hats and younger men seldom do. But, space will be considered for one or two men's hats.

As mentioned in the introduction, Koreans sit on the floor and use "Yi-bool" and "Yo" in place of a bed. Therefore, the place to store them should also be provided in the closet. The size and thickness of these are almost the same as a Western mattress and blanket. However, they are not the same exactly since they are not made at the factory, but at home as needed by each family.

Space for luggage is also needed in the apartment and will be considered.

A very different thing from Western closets is that a shoe rack is not needed. In Korea, shoes are removed at



Women's dress when hung on a hanger

Figure 8. Korean Traditional Costume for Men and Women

the door and left on the porch or kept in a closet which is usually placed on the front porch. Since the Mapo Apartment has a front porch and a balcony as shown in Figure 1, space for a shoe rack in the closet is not necessary.

Thus, storage arrangements should be planned with special consideration of space for Korean dress as well as Western clothes, bedding, and luggage.

Another fact to be considered is the residents themselves in the Mapo Apartment. They belong to the middle class, engaging in "white collar" jobs mostly; therefore, the kinds and numbers of items stored will be selected with this in mind.

### Clothes

Many garments ordinarily stored on hangers are fully 24 inches wide. When garments are hung close to each other on the rod, they tend to be pressed to a greater width than when hung singly. If the closet is too shallow, wide garments scrape the wall as they are pushed along the rod, and they may be crumpled between the door and the back of the closet. Depths of 26 to 28 inches are desirable if no coats with large sleeves are to be stored in the closet. Women's coat sleeves are often large, and as a rule coats are less compressible than other garments. Coat closets are usually 26 to 30 inches deep and the closet in Mapo Apartment will be designed 28 inches deep.

Closets usually extend from floor to ceiling, so the total height is determined. Height of the rod and shelves should be varied according to the needs of the user. Both rod and shelving are more useful if they are low enough to be seen and reached easily. A space of about  $2\frac{1}{2}$  inches should be allowed between shelf and rod to provide for placing hangers on the rod. Between the longer garments and the floor, a space of about 6 inches is required for using the dust mop. But in Mapo Apartment, several trays for folded garments will be placed on the floor and the floor of the closet will be designed one inch higher than the floor of the room to prevent dust from seeping into the closet. The rest of the height varies between persons, since it is the distance from the top of the rod to the bottom of the longer garments.

The longest garment for an average man does not exceed 54 inches in length. A rod height of 60 inches will allow 6 inches below the bottom of this garment. The bottom of the shelf above the rod will be  $62\frac{1}{2}$  inches above the floor, a height that makes the shelf easy to reach and see into.<sup>9</sup>

The Alabama Polytechnic Institute storage bulletin shows average measurement for clothing storage as follows:

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<sup>9</sup>Rod Closets for Southern Farm Homes, Agricultural Experiment Station, Bulletin 325 (Auburn University, 1960), pp. 6-9.



From floor to rod -

67 inches for street dresses.

45 inches for suits, blouses, and skirts.

72 inches for floor-length dresses.

3 feet minimum rod allowance per person.

11 to 15 inches depth of shelf above rod.

11 inches depth of second shelf above the rod.

9 inches between shelves for hat box.<sup>10</sup>

The clothes closet for husband is designed with the following dimensions: Closet depth of 28 inches is ample for storing an overcoat. Rod height is 58 inches, 52 inches to hang coat plus 6 inches for dusting floor without removing garments from the closet. Trays for folded garments have been built on the raised floor. Height of hat shelf is 61 inches. The space between this shelf and the next is 8 inches. Depth of hat shelf is 16 inches. Therefore, the space 8 inches deep behind the hats could be used for storage of items out of season.

For the wife's closet, a depth of 28 inches is required for storing coats and Korean dresses. Rod height is 60 inches, 54 inches to hang robe plus 6 inches for dusting floor, but the folded garment trays will also be placed under the hanging garments.

The kinds and numbers of garments, rod length required, and their facility and location are determined as shown in Table I and II for storage planning (Figure 9).

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<sup>10</sup>Storage for Your Home (Circular 222, Extension Service, The Alabama Polytechnic Institute), p. 4.

TABLE I  
HUSBAND'S ROD CLOSET  
(Moderate Number of Garments)

No. in Figure 10	Garments on Rod				Other Items Stored		Facility and Location
	Quantity	Kind	Space per Garment (Inches)	Rod Length Required (Inches)	Quantity	Kind	
1	1	Overcoat	2 $\frac{1}{2}$	54	*	Folded Garments	Trays in the Closet
2	1	Robe	2	54		Korean Dress	
3	1	Raincoat	2	54		Pajamas	
4	3	Trousers	1 $\frac{1}{2}$	48		Underwear	
5	1	Sweater	1	33		Socks	
6	1	Wool Shirt	1 $\frac{1}{2}$	33		Jewelry (Tie pin, etc.)	
7	3	Work Shirt	1 $\frac{1}{2}$	33		Handkerchiefs	
8	3	Jackets	2	31		Mufflers	
9	5	Suits (trousers full length under jacket)	3	31		Gloves	
10	2	Work Pant (folded on hanger)	2 $\frac{1}{4}$	32	2	Hats	
					*	Ties	Rod on door
					*	Belts	Hooks on door
						*Numbers not specified	

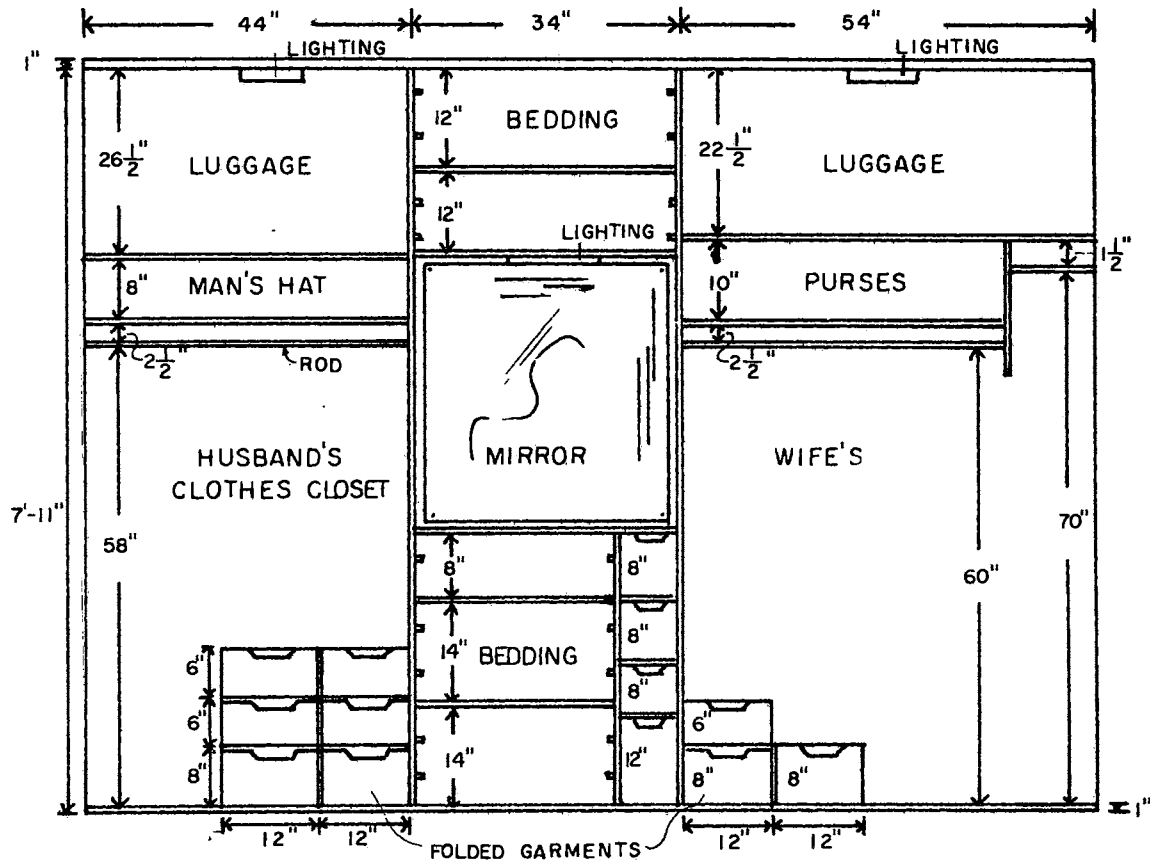
TABLE II

## WIFE'S ROD CLOSET

(Moderate Number of Garments)

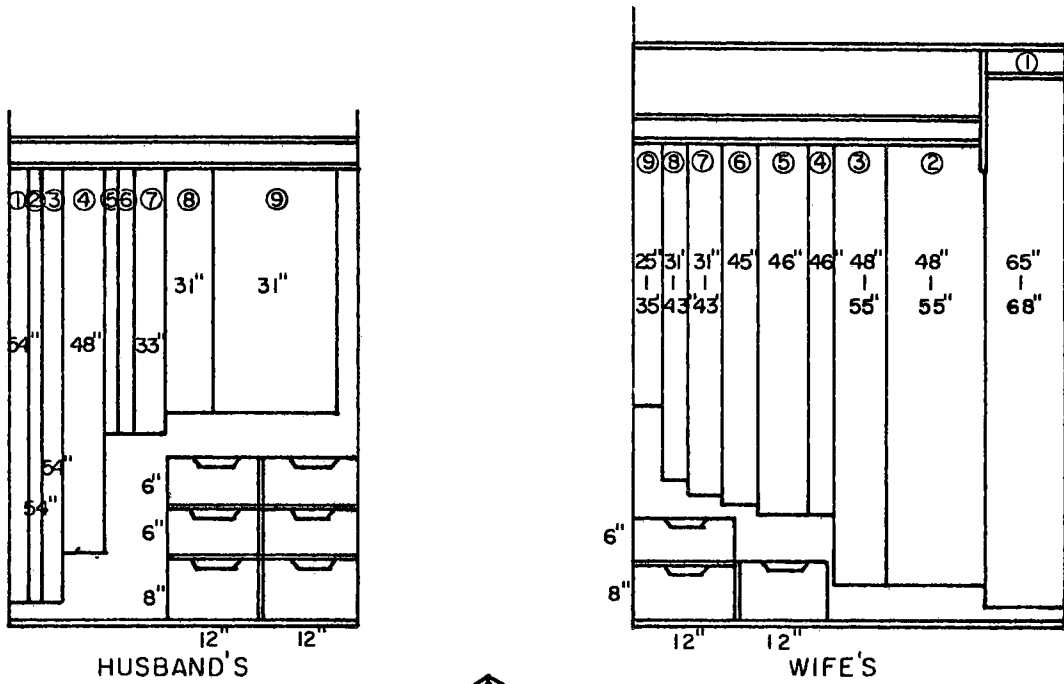
No. in Figure 10	Garments on Rod				Other Items Stored		Facility and Location
	Quantity	Kind	Space per Garment (Inches)	Rod Length Required (Inches)	Quantity	Kind	
1	4	Korean Dress	$2\frac{1}{2}$	65-68	*	Folded Garments	Trays in the Closet
2	6	Good Dresses	2	48-55		Korean Dress Sweater Underwear	
3	4	House Dresses	$1\frac{3}{4}$	48-55		Panties Brassiers	
4	1	Robe	2	46		Girdles Slips	
5		Good Coat	$3\frac{1}{2}$	46		Pajamas Slacks	
6		Suit (wool skirt under jacket)	$2\frac{1}{2}$	45	1-2	Slips	Hooks on door
7	4	Skirts	1	31-43	*	Belts	Hooks on door
8	1	Jackets (medium light)	2	31-43	*	Some Slips, Petticoats, and Hose, Handker- chiefs, Gloves, Scarves, Jewelry, and Cosmetics	Stored in the Drawers under the Dressing Table
	1		1				
9	4	Blouses	1	25-35			

\*Numbers not specified

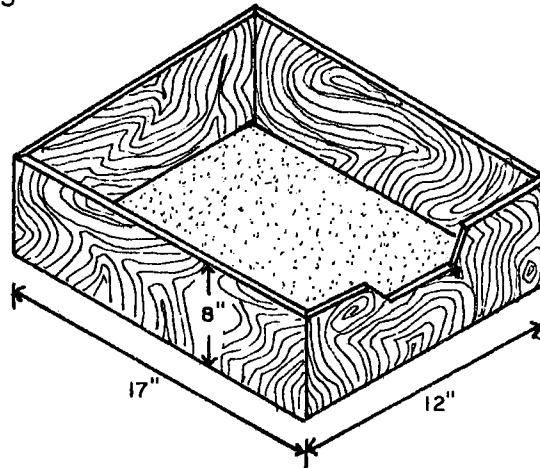


SCALE: 1/2" = 1'-0"

Figure 9. Arrangement of Closet Including Drawers, Dressing Table With Mirror, and Wardrobe Space - Show With Doors Removed



SCALE:  $\frac{1}{2}'' = 1'-0$



TRAY FOR CLOSET SHELVES

Figure 10. Clothes Closet for Husband and Wife With Specific Dimensions

## Bedding Supplies

Pull-out shelf units with adjustable heights will be used for bedding supplies for greater variety in shelf spacing (Figure 11). They provide flexibility that is not possible in fixed shelves or drawers. This flexibility makes them adaptable to seasonal changes as well as to changes over longer periods of time. Since the shelves pull forward as drawers do, they may be placed closer together than stationary shelves.

According to American standards, 5 shelves 20 inches deep, in 26 inch wide storage units could provide space for four of the total limited supply of blankets, comforters, and quilts.

No. in Figure 11	Quantity	Kinds
1	4	Blanket sheets
2	1	Bedspread
3	6	Sheets
4	7	Pairs Pillowcases
5	1	Bedspread
6	6	Dresser Scarves
7	2	Blankets ("Yo")
8	2	Blankets ("Yi-bool")

Less accessible space 24" x 24" x 33" is needed for the remainder of warm bed covering. As bedding supplies are almost always made at home in Korea, the storage for bedding will be designed with the size of 24" x 26" for flexibility. The height of each adjustable shelf could be arranged as required by family needs and kind and number of articles.

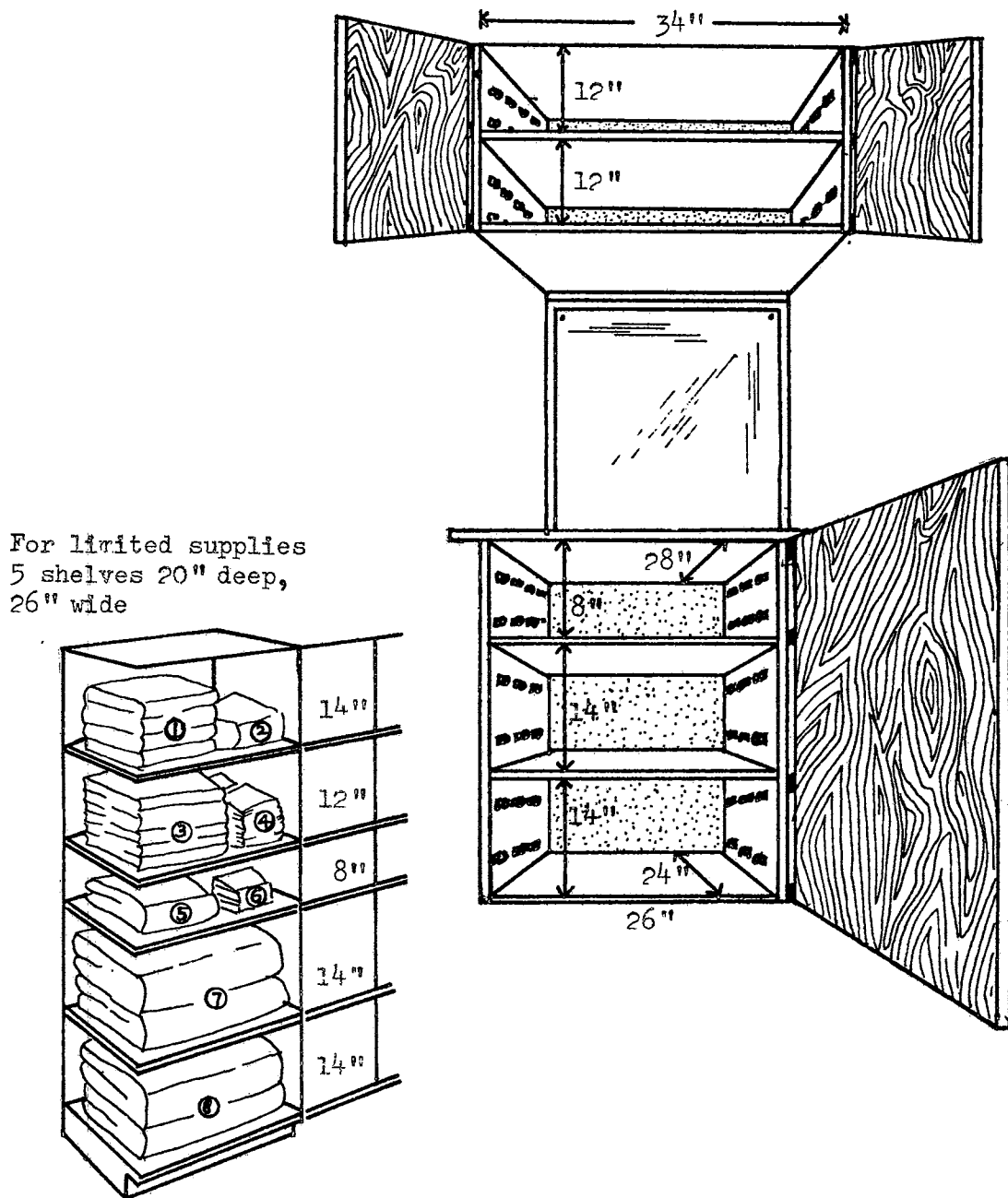
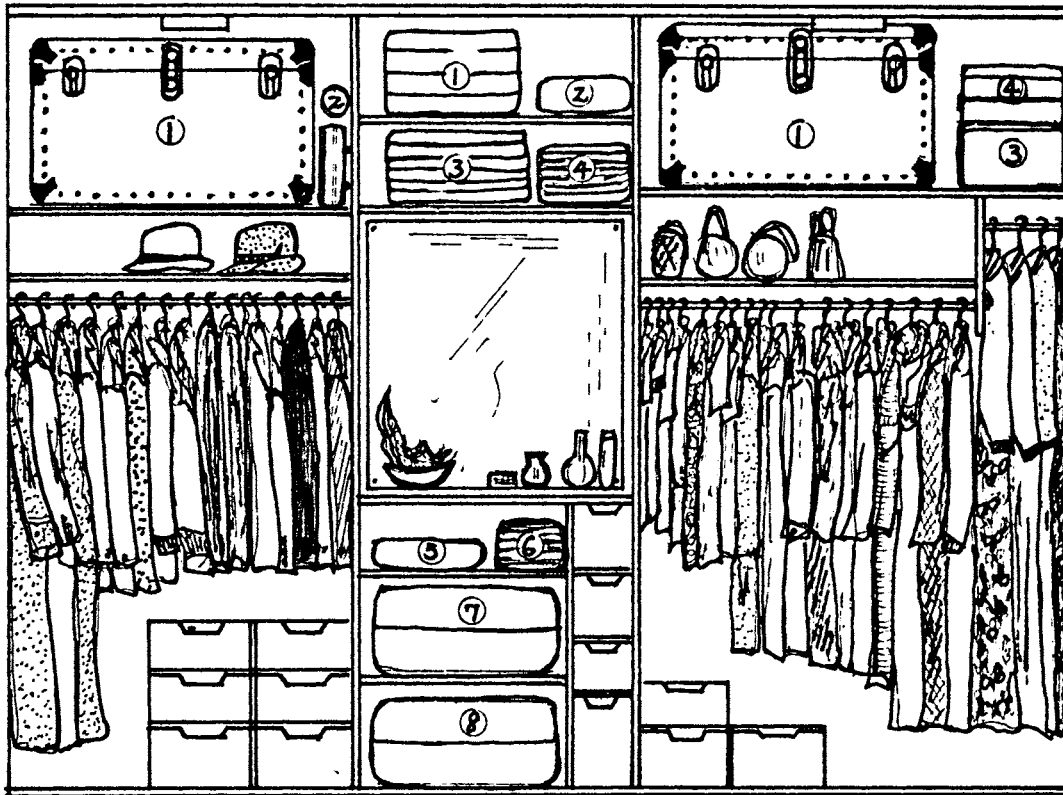


Figure 11. Bedding Closet Units With Pull-out Shelves and Mirror - Doors Hung to Clear Extended Shelves



Scale:  $\frac{3}{2}'' = 1' - 0''$

Figure 12. Arrangement of all Items in Closet Units



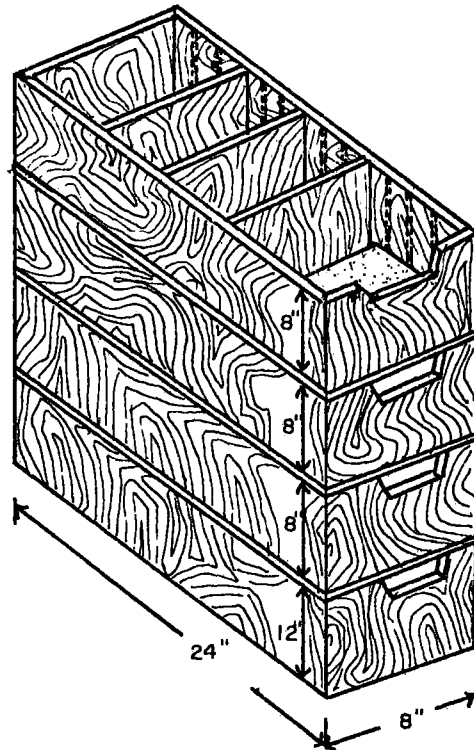


Figure 13. Slip Tray Units  
for Cosmetics,  
Jewelry, Hand-  
kerchiefs, Some  
Underwear,  
Stockings and  
Socks, Showing  
Adjustable  
Partitions



Scale:  $\frac{1}{2}'' = 1' - 0''$

Figure 14. The Closet Units With Doors

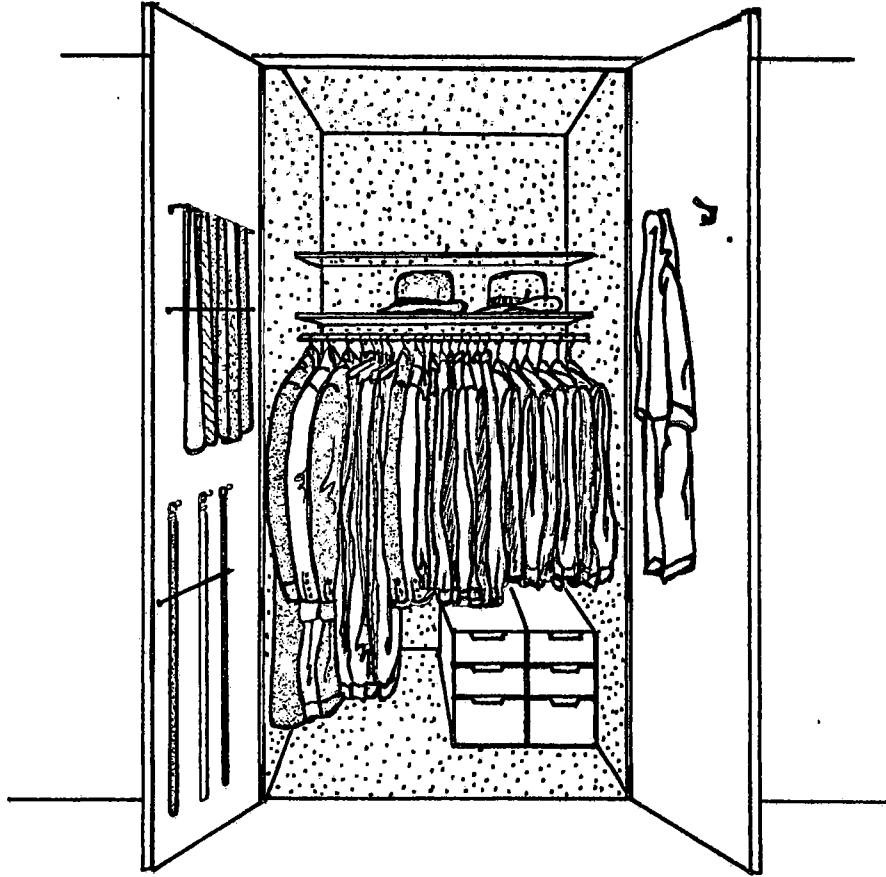


Figure 15. Clothes Closet for Husband

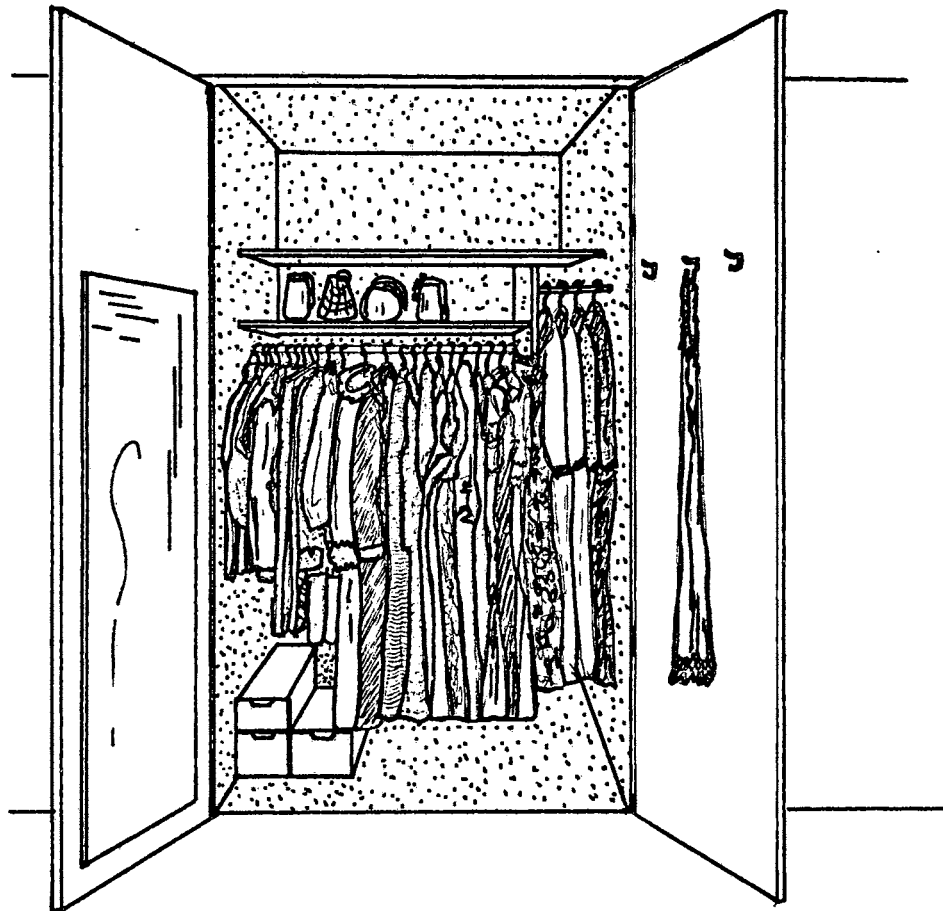


Figure 16. Clothes Closet for Wife

Luggage

The following table shows the average luggage sizes. Since the space is limited in the bedroom, and top shelves only will be used for luggage - two dress trunks, one train case, a 2-suiter and pullman case could be accommodated. This would be enough for the average Korean family.

No. in Figure 12	Kinds	Depth	Width	Height
1	Dress trunk	20"	36"	24"
	Metal locker	15"	27"	9"
	Man's			
	3 suiter	18"	24"	8"
3	2 suiter	17"	22"	7"
	Woman's			
4	Pullman case	13"	21"	7"
2	Train case	9"	12"	5"

Other Items Stored

Belts. Women differ as to their preference for storing each belt on the hanger with its dress or grouping the belts in one place. Some belts are used with more than one dress and need separate storage.

Belts could be stored on hinged closet doors (Figure 16). Those with buckles may be hung on small hooks. Since the closet is not long and door cannot be wide, a horizontal rod should be placed about 12 inches below the hooks. The belts are slipped behind to keep them from swinging out into the door closure. This rod is also useful for storing tie belts. To make the belts accessible, a hook should be allowed for each one, and the hooks spaced according to the width of the belts.

Men's belts with tongue buckles may also be stored on hooks. Belts with slide buckles may be hung on a stiff wire rod attached horizontally to the door and extending about a half-inch from the door surface (Figure 15).

Ties. Tie racks may be fastened to hinged closet doors. They should be located well back from the free edge of the door, or the ties protected by a rod to keep them from swinging into the door closure. The average length of a tie folded is two feet (Figure 15).

Hats (husband's). The general size of a hat box is a width of 1'4" and a height of 8". One or two hats and hat boxes will be stored on the shelf over the rod (Figure 9).

Purses (Wife's). As the Korean women do not wear hats, purses could be stored on the shelf over the rod (Figure 9).

Cosmetics, Jewelry, Socks, Hosiery, and Other Small Articles will be stored in the slip trays under the dressing table. These drawers can be made more efficient for storage by the use of partitions and trays. Partitions keep things in order and slip trays make better use of deep drawers (Figure 13).

## Closet Fixtures

### Doors

For accessibility, it is desirable to have a full-front opening. The conventional door-in-a-wall closet

limits the access to the storage space because the side and the space near the ceiling are blocked by the jamb and the head of the door.<sup>11</sup>

Various kinds of doors can be used on full-front closet openings: sliding, folding, hinged, and accordion type door. Each of them has advantages and disadvantages.

Sliding doors. Sliding doors do not take floor space and if each door goes back into the wall at different sides, the whole closet area is accessible, but if these doors slide one over the other only half of the space can be reached at one time. Care needs to be taken that there is ample space so that the movement of doors does not catch the sleeves of the clothing that is stored inside. Thought needs to be given to keeping the mechanical part of the door in working order. Skill is necessary in hanging these doors.

Folded doors. Folding doors suspended from overhead tracks require more clearance space than accordion doors. If the opening is not too large, bi-fold panels are used. With the two doors open, the content of the closet is easy to reach and two people can get to the clothing at the same time. They save floor space, but may require extra closet depth when folded.<sup>12</sup> They cannot be used for

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<sup>11</sup>Household Storage Units, Circular-Series, C5-1 by Small Homes Council (University of Ill. Bulletin, 1953), p. 4.

<sup>12</sup>Lucille Clark, Where to Store What? and Why? (L 67-1095), pp. 11-12.

hanging articles on the back of them and unless care is taken fingers can be pinched.

Accordion doors. The accordion doors can be inexpensive, but there are heavy weights that are expensive. These doors require very little floor space and are not difficult to install. They do not protect the contents of the storage space from dust; however, they make for sufficient ventilation. They give an almost complete opening so that two people can work at the storage space at the same time.

Hinged doors. In order to use the back of these doors for hanging articles, they need to be installed with three substantial hinges. The amount of storage on the door will need to be considered when determining the amount of space needed inside the closet.<sup>13</sup>

If the closet is wide, more than one door per closet is needed to make the total closet easily accessible to the user.<sup>14</sup> The main advantage of swinging doors is that the entire closet is opened with one movement. There are no tracks, ridges, or guides to collect dust and mar appearances, and the storage unit interior may be altered in many ways without removing or replacing the doors.<sup>15</sup>

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<sup>13</sup>Ibid., p. 12.

<sup>14</sup>Designing Clothes Closets, Mississippi Cooperative Extension Service, p. 7.

<sup>15</sup>Sunset, p. 124



Having no problem with the space for swinging the closet doors, and needing tie and belt storage, the hinged door will be recommended for the Mapo Apartment.

Closets up to 4 feet long usually require two doors, using no more than 2 feet per door. It is also desirable with plywood doors or when the ceiling is more than 8 feet high to make separate doors for the upper and lower part of a closet. But, in Mapo Apartment, for easier access to shelving in the upper section of the closet, 7'11" high doors are desirable. Good hardware is essential for the satisfactory operation of doors (Figure 14). Ventilation is essential in Korea in order to prevent mildew in the hot and humid season. This circulation of air is desirable. Louvered doors provide ventilation; however, as they are difficult to clean and allow dust to enter the storage space, they are not recommended for the Mapo Apartment.

### Mirror

A mirror will be set above the dressing table, but another long mirror is recommended for the inside door of the wife's closet. A full length mirror is desirable (Figure 16).

### Lighting

A 60-watt white bulb in a socket mounted over the door on the inside closet wall provides light for the

entire closet. It will be convenient if this light is controlled by an automatic door switch. However, a pull-chain fixture could be used with care.<sup>16</sup> Closet walls of a light color will give a higher light reflectance and are recommended.

#### Storage Hints

Storage units can be made of either  $\frac{1}{2}$ -inch or  $\frac{3}{4}$ -inch material for face board and  $\frac{1}{8}$ -inch for hardboard back. Shelves can be made of  $\frac{1}{4}$ -inch plywood.<sup>17</sup>

The diameter of the rod for clothes closet is determined by its length. One and three-eighths-inch wood pole could be used for the closet in Mapo Apartment.

For the clothing on hooks, the spacing should be 7 inches minimum and the height of hooks should be from 45 inches to 60 inches above the floor.

For the folded garments, look-in drawers are used. Their openings serve a twofold purpose: first, they make it possible to look into the drawers and determine the contents before pulling the drawer out; and second, they make excellent drawer pulls.

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<sup>16</sup>Clark, Where to Store, p. 13.

<sup>17</sup>Herman H. Siegle, Cabinet and Built-ins (Chicago, 1961), pp. 28-31.

## Hangers

Wire hangers. These take up the least space and are convenient to use. There should be one for each dress.

Wooden hanger. These are better than wire hangers for heavy garments such as suits and lightweight coats.

Padded hangers. These are best for very heavy garments as men's coats with padded shoulders and women's coats with padded shoulders.

Skirt or trousers hangers. These keep trousers and women's skirts pressed.

Garment bags. Plastic or cloth bags may be used to keep the best dress, suit or coat from getting faded or soiled.

Moth-proof bags. These are used for storing woolen garments when such articles are stored in the home during the summer. All articles should be cleaned before storing.<sup>18</sup>

Tie rack. A desirable tie rack can be made with two towel bars.

In the slip trays, cardboard boxes can be used instead of making dividers to keep drawers orderly.

For attractive storage areas, it is recommended to paint the inside walls a light, cheerful color. This can

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<sup>18</sup>Lucille Clark, Check Your Home for Storage Areas (Oklahoma State University Series No. 2, Clothes Closet), L-948, p. 18.

also be accomplished by using wallpaper, gift wrapping, or contact paper to cover boxes used for storage.<sup>19</sup>

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<sup>19</sup>Designing Clothes, p. 11.

## CHAPTER IV

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

No house can have too many well-placed and well-planned closets. That is to say, closets should be conveniently located in the house.<sup>1</sup>

The bedroom, where a third of life is spent, needs adequate storage more than any other room; not only does one sleep there, he dresses and undresses, reads, relaxes, writes letters, works at hobbies, and in case of illness, spends his whole time there.

In spite of the importance of storage facilities in the bedroom, they have not been adequately studied and the advantages of built-in storage have not been considered in Korea. The storage problems found in the floor plan of the Mapo Apartment have been selected as the bases for this thesis.

As a result, four possible space arrangements for storage units were devised, and one of these plans has been developed as the best solution to the problem. Specific dimensions and item arrangements show how built-in storage can be accommodated in the master bedroom for

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<sup>1</sup>Siegle, p. 28.

efficient space utilization and easier living. This plan also shows ideas for improving storage facilities adapted to the habits and customs of Korean people.

The results of this study have implications for design, construction, and use of storage units that accommodate various kinds of items.

Well-designed storage closets depend, to a great extent, on correct dimensions. Location, type of doors selected, adequate ventilation and lighting are also important factors to consider.

Storage walls are compact. When they use all the space from floor to ceiling, they make maximum use of floor space. Because they serve the dual purposes of partitioning and storing, they make double use of space.

Built-ins have certain advantages over portable storage furniture. Linear arrangement of units and construction from floor to ceiling give an appearance of orderliness and reduce cleaning problems. Provisions of more than the usual amount of readily available storage space makes it possible for homemakers to keep in an orderly manner many items that might otherwise clutter the house.

In making the specifications for design of functional storage units, the space for storing items, for reaching-in, for cleaning, and for the structural parts of the unit itself should be considered carefully. The user, the designer, and the builder need to have a clear

understanding of what allowances are included in each set of dimensions.

When units are designed for multiple use, care should be taken to allow sufficient space to prevent one use from interfering with another.

To have storage that best serves one, it takes the work of both head and hands using rules for organization plus determination to replace things after a location for them has been established.

It is important to remember that the smaller the space one has for living, the greater will be the need for storage. Therefore, practice in putting things where they belong is also important as well as the storage unit itself.

Built-ins are the answer to the problems of storage for small bedrooms, especially in apartment buildings.

#### Recommendations

To help built-in storage plans to become a part of Korean homes, the following recommendations are made with the hope that the proper related or interested agencies can give a hand to fostering and promoting the adoption of them:

- (1) A national organization sponsored by various construction industries, interested agencies, and individuals needs to be organized in order to foster the built-in storage plan.

This organization would provide information and research on built-in storage.

- (2) Construction companies, building materials manufacturers, and builders consider including built-in storage in house designs as well as in apartment buildings and in multiple houses.
- (3) Encourage educators in the fields of Home Economics and applied arts to emphasize better storage facilities and urge homemakers to improve their storage facilities.

Recommendations for further studies concerning this problem are suggested as follows:

- (1) Storage facilities for rural families in Korea.
- (2) Storage facilities in living rooms and bathroom areas as well as bedrooms.
- (3) Storage in the children's bedrooms.
- (4) Suggestions for accessories in the master bedroom closet.
- (5) Built-in storage units which can be used in dead-end hallways, in an unused dormer window, an unused door area, or other spaces not fully utilized.



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