

PROPOSED PLAN FOR
THE REBUILDING OF THE CITY OF HELWAN,
EGYPT

by

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INTRODUCTION

The city "Helwan El-Hammamat" is Egypt's premier health resort. It is 15 miles south of Cairo and 2.5 miles east of the River Nile; its population is 7,444 persons. Helwan is considered a health resort all the year round. The air is dry, the daily average of sunshine is eight hours and the rainfall is less than one tenth of an inch per annum. The dry air and the sulphur waters of Helwan have given the city its reputation as a health center. The combined action of the climate and the baths gives marvelous results in the treatment of chest complaints, asthma, rheumatism, skin diseases, heart disease and valvular irregularities.

The city of Helwan, as it is now, has all the natural resources to be at the top among all the cities of Egypt as a health resort. But it needs what a modern city needs. There is no tie between the different parts of the city. The railway line divides the city into two parts and a second railway line passes through the city at the west side, limiting the natural growth of the city towards the River Nile. The east side, which is a hill, serving as a stone quarry, limits the growth of the city in that direction. At the west, there is the slum area where the miserably poor class exists. This slum area stands near by the springs and the baths, which give the city its reputation as a health resort.

The highway from Cairo ends in an unstudied manner. There is no regular road leading to the quarries. No recreational facilities have been taken into consideration except a few gardens for all the thousands of people arriving at the city every

day. While the people living in Cairo go to Helwan anticipating the baths and the dry, healthy climate, the people of Helwan leave their city and go to Cairo to have the recreational facilities they cannot get in their city.

The aim of this study was to give the city what it needs. It needs new adjoining residential areas forming communities. It needs neighborhoods which are more nearly self-contained, where the shops and other sub-centers of the community can be grouped in a convenient and attractive manner. It needs a stable and convenient business center with parking spaces, schools full of light and air, with playgrounds around them, light and air for every dwelling, parks with playgrounds, swimming pools and sports facilities and, above all, it needs order and beauty, as it is something all people react to, and their lives and thinking are better for it.

HISTORY AND BACKGROUND

The history of the city of Helwan starts one hundred years ago when Mohamed Aly Pasha, the ruler of Egypt, ordered a survey to be made where the springs were situated south of Cairo. Later, in the year 1848 during the ruling of Abbas Pasha the First, part of the troops were camping near the springs. A soldier infected with a skin disease went to wash himself in the water of the springs. Upon being cured, the news spread among the troops. Abbas the First, on hearing the news, ordered that a bath be built at the site. Six years later he died before the work was started. A few years after that Khedevie Esmael Pasha, the new ruler, in the year 1868 sent a mission of famous doctors and scientists to

obtain a report on the value of the sulphuric water and climate of the site. After obtaining the favorable report, Khedevie Es-mael issued orders for planning the city of Helwan. He had built a palace for his mother at the northwest edge of the city on the River Nile. In the year 1869, a project was studied and the work started for building baths and a rest house. In 1873 the first railway line was constructed between the Citadel at Cairo and Helwan. In the year 1879 Khedevie Tewfik, the new ruler, lived in Helwan. At that time the princes and the rich people started to think of living in Helwan and they built splendid palaces and homes, some of which are still exist. In December, 1899, the baths were completed.

The Springs of Helwan

The springs of Helwan are composed of six springs: two springs of sulphuric water used in the baths, two springs of sulphuric water used in the free baths, one spring of mineral water and the new spring, which was discovered in March, 1939.

Reports on the Sulphuric Water of Helwan Springs

The report of Professor Gastinell:

One litre of the sulphuric water contains

Sulphur gases044 gm.
Carbon gases120 gm.
Nitrogen gases	--
Sodium chloride	3.200 gms.
Magnesium chloride	1.812 gms.

Calcium chloride	0.188 gm.
Calcium sulphate	0.240 gm.
Calcium carbonate	0.560 gm.
	<u>6.000</u> gms.

The report of Salem Pasha Salem:

Sulphur gaseous compounds044 gm.
Carbon dioxide120 gm.
Nitrogen	--
Calcium chloride	0.188 gm.
Magnesium chloride	0.818 gm.
Sodium chloride	3.200 gms.
Calcium carbonate and sulphate	0.560 gm.
	<u>5.666</u> gms.

The report of H. W. Richmond:

Calcium chloride	0.239 gm.
Magnesium chloride	1.004 gms.
Sodium chloride	5.624 gms.
Potassium chloride	0.032 gm.
Magnesium sulphite	0.0447 gm.
Calcium sulphate	1.151 gms.
Silica	0.015 gm.
Iron compounds	0.014 gm.
Carbon dioxide	0.117 gm.
	<u>8.2407</u> gms.

The value of the different springs in curing diseases:

The different kinds of springs in the city of Helwan have great value in curing many kinds of diseases.

The following are the diseases cured by each kind:

The sulphuric springs

1. Skin diseases
2. Bone complaints
3. Rheumatism and arthritis
4. Chest diseases, as asthma
5. Kidney trouble
6. Sciatic trouble
7. Blood trouble

The iron springs

1. Help digestion process
2. Kidney trouble and urine disorders

The mineral springs

1. Help digestion
2. Used as a laxative
3. Heart diseases and valvular irregularities

The New Spring. At the beginning of March, 1939, while workmen were repairing the railway line, a new spring suddenly appeared three fourths of a mile from the border of the city of Helwan. The report of the public health authorities (June 12, 1939):

1. Water comes out in the shape of a fountain a few inches above the water level. The current is 600 cubic feet per hour. The height of the spring is 135 feet above sea level.

2. The water contains sodium chloride, magnesium chloride, calcium sulphite, magnesium sulphite, calcium bicarbonate and a small percentage of iron, iodine and arsenic.

3. The value of this water is in curing kidney and liver trouble, and rickets in children.

The Radium in the Springs of Helwan. The springs of Helwan were found to contain four units per litre of radium. The new spring contains six units per litre.

Fouad First Sanatorium

It was found that the climate of the city of Helwan is the best for curing chest diseases. Among all the cities of Egypt, Helwan was chosen by the government for locating its Sanatorium for curing tuberculosis. The Sanatorium was built occupying the northeast portion of the city. From all parts of the world people come to be cured at Fouad First Sanatorium.

The city of Helwan and its Sanatorium were recommended to the famous actress, Vivian Leigh, by doctors for curing her chest complaint. The springs of Helwan and the Sanatorium have given the city its world-wide reputation as a health resort.

STATEMENT OF THE PROBLEM

The two divisions of the problem are:

The city planning scheme

The building design scheme

CITY PLANNING SCHEME

The scheme is a general study of the city based on three main parts.

1. The first part was replanning the existing parts which

stand against the progress and growth of the city.

2. The second part was adding new areas planned for the growth of the city.

3. The third part was locating the recreation areas, the school areas, shopping centers and the main public buildings.

REPLANNING THE EXISTING PART

The characteristics of the existing part are the regular patterns formed by perpendicular streets placed at equal distances, forming rectangular areas; each is divided into four lots. All the streets are 60 feet wide, 15 feet for sidewalks, and planted with trees. It is proposed in the scheme to eliminate each other street running from the north to the south, the purpose being to reduce the area of the streets which reduces the expenses of maintaining the roads, adding new areas to the existing properties and eliminating the crossroads for the traffic. Sidewalks can be provided for making it easy to reach the houses from any street.

The Railway Station. The railway station is located at the south part of the city. The railway line crosses the city from the north to the south, cutting the city into two halves. The only purpose of choosing that location was to bring the people as near the baths as possible.

In the new scheme the station was located to the north at the entrance of the city. The advantages of the new location are, to connect the two separate parts of the city, to provide a wide boulevard in the middle of the city, taking the heavy traffic from all parts of the city and creating a wide-open space, and to provide beauty lacking at the present time. In addition to those

advantages there will be the advantage of avoiding the accidents caused due to crossing the railway line.

The Railway Line Between Helwan and Kafr-Elelw. Kafr-Elelw is a small town to the south of Helwan of 2,656 population. At the present time a single-track railway line between Helwan and Kafr-Elelw passes through the west side of the city. As this line limits the growth of the city to the west, it was found suitable to locate the line at the east side passing by the East Hill. More than the advantage of opening the west side of the city, there will be the advantage of using this line for transporting the stones from the quarries, as it is limited now to truck transportation only.

The Highway Between Cairo and Helwan. The highway between Cairo and Helwan passes by the River Nile all the way, then turns to the left to end at the baths south of the city.

In the new scheme the highway was carried out in a straight line to the Hill side, then turned to pass by and parallel to the Hill, passing by the Sanatorium, then to the west, passing by the new railway station. So, the city was surrounded by a road to carry the traffic, from all parts of the city, fluently to the highway to Cairo.

Removing the Slum Area. In the new scheme the slum area at the south end of the city was entirely removed and replaced by a new area at the southeast part of the city.

NEW ADDITIONS TO THE CITY

For the future extension of the city, three new areas were planned and added to the present central part: the east, the

south and the west extensions.

The East Addition (C)

This extension was divided into two parts; the north part was provided and limited to the Sanatorium use and the south part as a residential area for the middle and low classes. To provide a low-cost housing project with maximum open spaces, this area was limited to apartment buildings of three and four stories.

The North Part. This part was reserved for the Sanatorium, taking into consideration the future extension and the elements lacking at the present time. A new extension to the hospital can be located in the central east portion of the area, having a back service way connected to the back road. Residential units for doctors and nurses can be located in the north portion of the area, as shown on the general layout. Also a recreation center was located between the units.

The South Part. As this part is limited by the Hill and there is a tendency to carry the traffic back to the city, the circular roads gave the best solution for planning this area. It provided a central space used as a public park, and a business center central with respect to all the residences. The roads give a smooth traffic flow through the entire area, connecting the new area with the old one. An area for two primary schools was provided, one for boys and the other for girls. The planning of the blocks was arranged to provide a better system of grouping the housing units in such a manner as to break the monotony of regularity and to get the residents in each block together, taking

care of their portion and living together as one big family.

The South Addition (B)

This extension was developed as a recreation area to the city. The baths are the feature of main interest in the city to thousands of people who come and leave every day specially for it; it was given the vista of the new central avenue surrounded by a park. South of the baths on its axis, a bus station was located on the highway from Cairo. Two solutions were given in regard to the baths.

A committee was appointed by the government on February 28, 1938, to study the possible solutions that can be provided to Helwan City. The suggestion made by the committee concerning the baths was to leave the present baths as they are, reserving them to third-class people and to plan a scheme for new baths on a lot owned by the government west to the railway line.

One of the two solutions was based on leaving the present baths and locating a swimming pool facing them, as shown on the suggested layout (Plate III B).

The second solution was based on removing the present baths, replacing them with a new scheme providing a main unit, which is a swimming bath, with two pools, making use of the water of the springs. A separate unit for treatment purposes was located near the main unit. This unit can be reserved for first and second classes, while a third-class unit can be located on the site of the free baths where two springs are limited at the present time to free use.

Other recreational facilities were provided near the baths as indicated on Sheet 2. The suggested new buildings are a cafe-restaurant, a music stand, a movie and stage theatre, an outdoor movie theatre, a sports club and a football stadium, hotels occupying the area close to the highway.

The West Addition (A)

A new residential district was added to the city in the new scheme, to be limited to individual houses only. Two solutions were studied for this area. The first solution was based on developing the complete area for houses of middle-class type, giving the maximum number of lots as shown on Plate III A. The second solution was based on planning the extension for higher-classed houses, dividing it into lots of large areas. The extension was given the triangular shape limited by the main road south and the present line running from the north to the west, which is the limit for the taxed properties of the city of Helwan. As the direction of prevailing wind is 45 degrees to the north, the houses take the best direction for orientation by turning the roads 45 degrees to fit the triangular shape. Another advantage is in carrying the traffic from the present part directly through those roads to the main road.

The Cul-De-Sac type was adopted in planning this area, which gave the most satisfactory solution. It provides the least traffic intersections, the least area of roads, playing areas for children, away from the traffic, back gardens for all the houses and picturesque grouping of houses. Sidewalks were provided be-

tween the houses leading to the back yard of each house for service and making it easy to reach any road directly. The public park was located at the central part of the area, a mosque and a sports club. A shopping center was located at the southeast end of the new extension, with a front parking area and back service way. The portion surrounding the shopping center was planned for small houses for the workmen employed in the stores.

THE BUILDING DESIGN SCHEME

Some of the important private and public buildings were studied and designed according to the customs and climatic conditions existing in that city. The buildings are a bus station, a swimming bath, a primary school, two different types of apartment buildings, a mosque, a house and a cafe-restaurant.

For designing a building at the city of Helwan, the following conditions are to be taken into consideration. The rainfall is less than one tenth of an inch per annum and the daily average of sunshine is eight hours. The average degree of temperature during the summer is 100 degrees F., and 60 degrees F. during winter in the day time. The weather changes gradually through the seasons. The direction of the prevailing wind is northwest. The streets and the buildings need protection from the sun during all the year except for two months of the winter. The proper orientation was chosen according to the above conditions. By facing the buildings north and northwest, the cool air can penetrate through them, giving a natural ventilation and cooling. The balconies and sheds at the east, south and west sides of the buildings give the protection

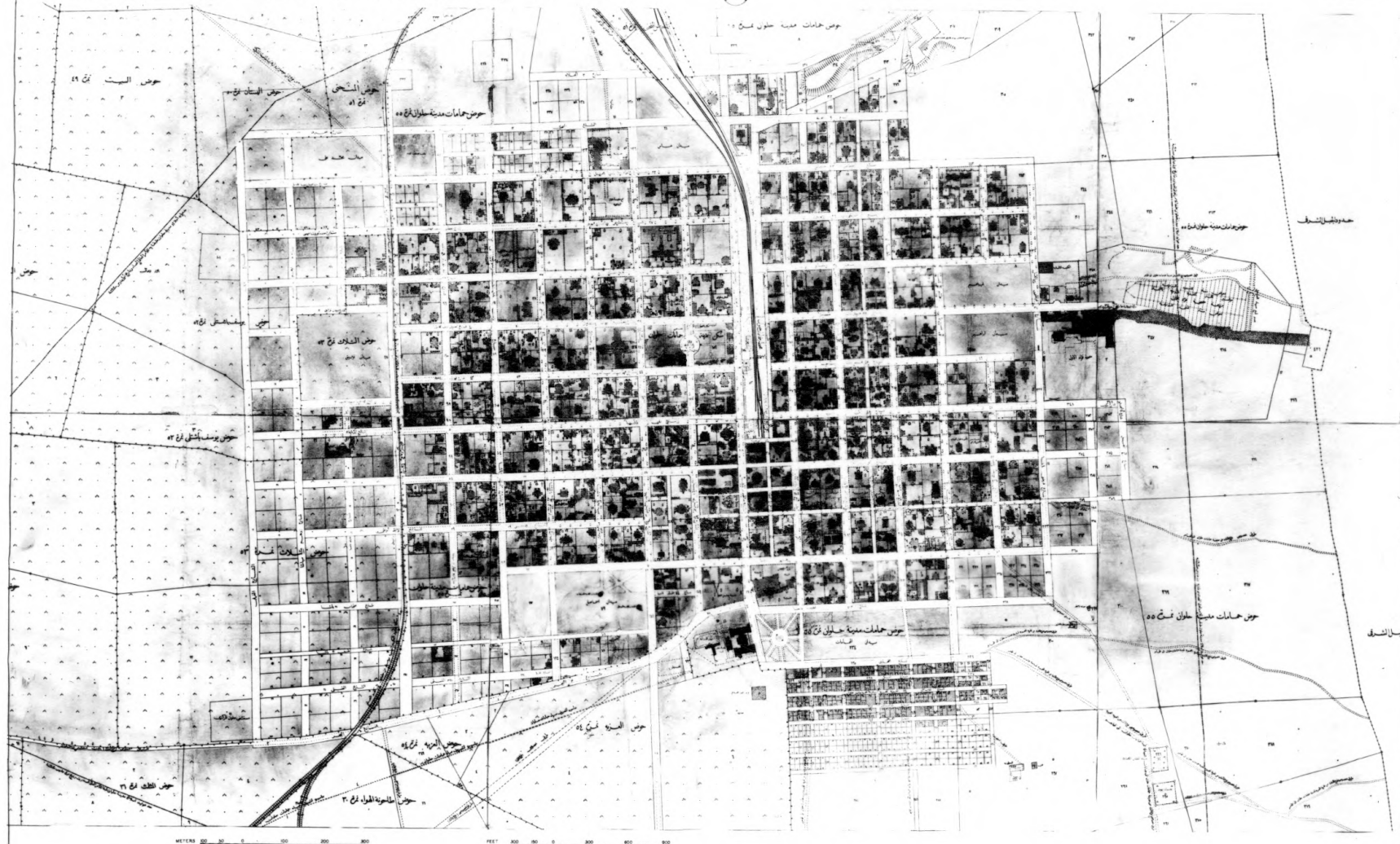
needed against the sun. Bricks and reinforced concrete are the main materials of construction.

EXPLANATION OF PLATE I

Present City Plan of Helwan

PRESENT CITY PLAN OF HELWAN

SHEET 1



EXPLANATION OF PLATE II

Proposed Future Plan of the
City of Helwan

A horizontal scale bar with two rows of markings. The top row is labeled 'FEET' and has markings at 0, 100, 200, 300, and 400. The bottom row is labeled 'METERS' and has markings at 0, 50, 100, 150, and 200.

SHEET 9

PLATE II

PROPOSED FUTURE CITY PLAN OF HELWAN

FEET 0 100 200 300 400

METERS 0 100 200 300 400



-A- THE NEW WEST ADDITION TO THE CITY

-B- THE NEW SOUTH ADDITION

-C- THE NEW EAST ADDITION

THE PRESENT
PORTION OF THE CITY
TO REMAIN
UNALTERED

1. SWIMMING BATHS
2. CLINIC
3. BUS STATION
4. CAFE - RESTAURANT
5. MOVIES & STAGE THEATER
6. OUTDOOR THEATER
7. SPORTS CLUB
8. FOOT BALL FIELD
9. HOTEL
10. APARTMENT BUILDING
11. MOVIES THEATER
12. MOSQUE
13. BALNE SODAE
14. SHOPPING CENTER
15. SCHOOL
16. APARTMENT BUILDING
17. HOLIDAY FIRST SANATORIUM
18. BUILDING EXTENSION TO ...
19. DOCTORS RESIDENCE
20. CLUB
21. NAUPOSS RESIDENCE
22. RAILWAY STATION
23. A POLICE
24. MOSQUE
25. SPORTS CLUB
26. SHOPPING CENTER

EXPLANATION OF PLATE III A

Second Solution for Planning the
East Addition to the City

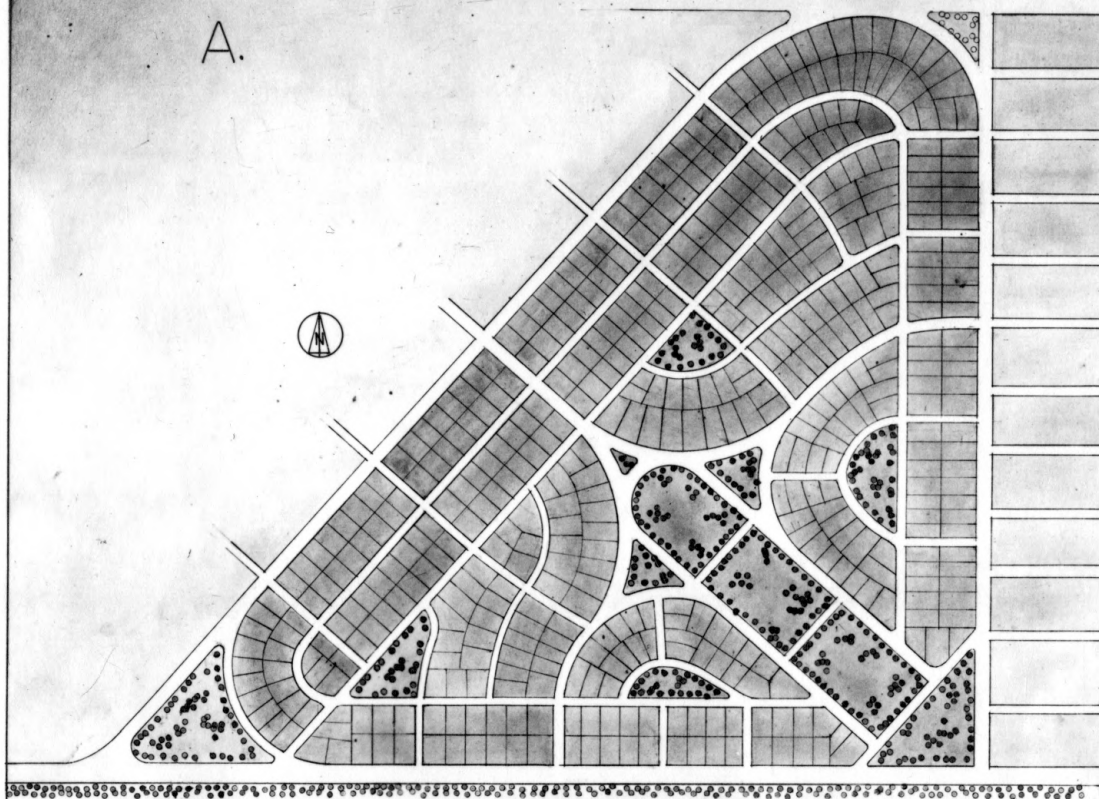
EXPLANATION OF PLATE III B

Second Solution for Planning the
South Addition to the City

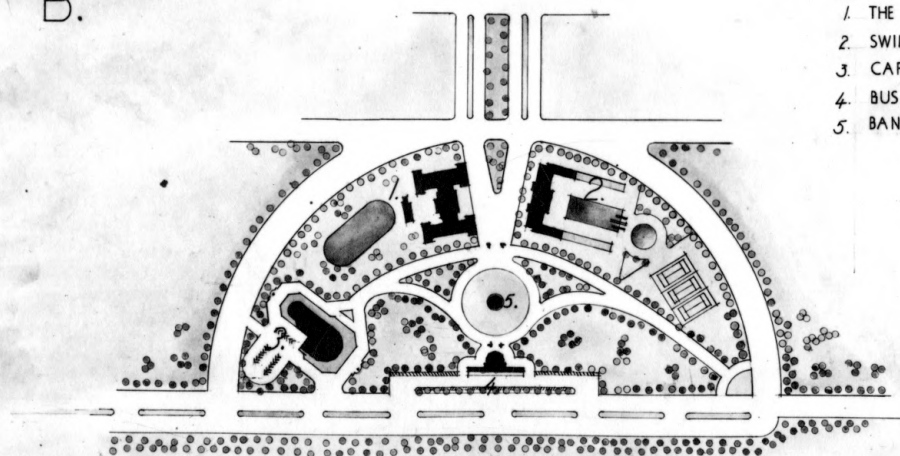
PLATES III A and III B

SHEET 3

A.



B.



1. THE BATHS.
2. SWIMMING POOL
3. CAFE-RESTAURANT.
4. BUS STATION
5. BAND STAND

A. H. Kamel.
Dec. 1966.

THE BUS STATION

The bus station was located south of the swimming baths, as the baths are the point of interest in the city to visitors. The building was designed to serve as a bus station and cafe. The requirements:

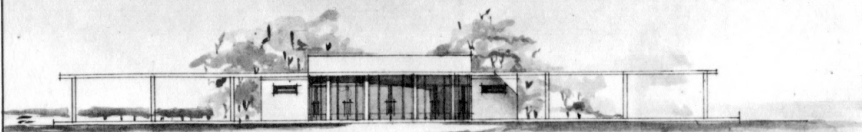
1. An office includes an inquiry and ticket window.
2. A hall provided with a lunch counter to serve as a cafe and waiting room.
3. A kitchen.
4. Toilets for men and ladies.
5. A shaded area connected to the building to be used for waiting and parking the buses.
6. Parking areas for private cars and cabs.

EXPLANATION OF PLATE IV

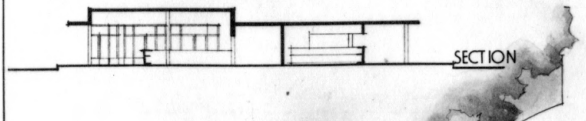
The Bus Station

PLATE IV

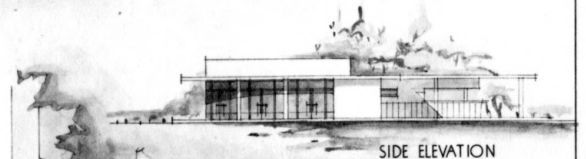
SHEET. 5



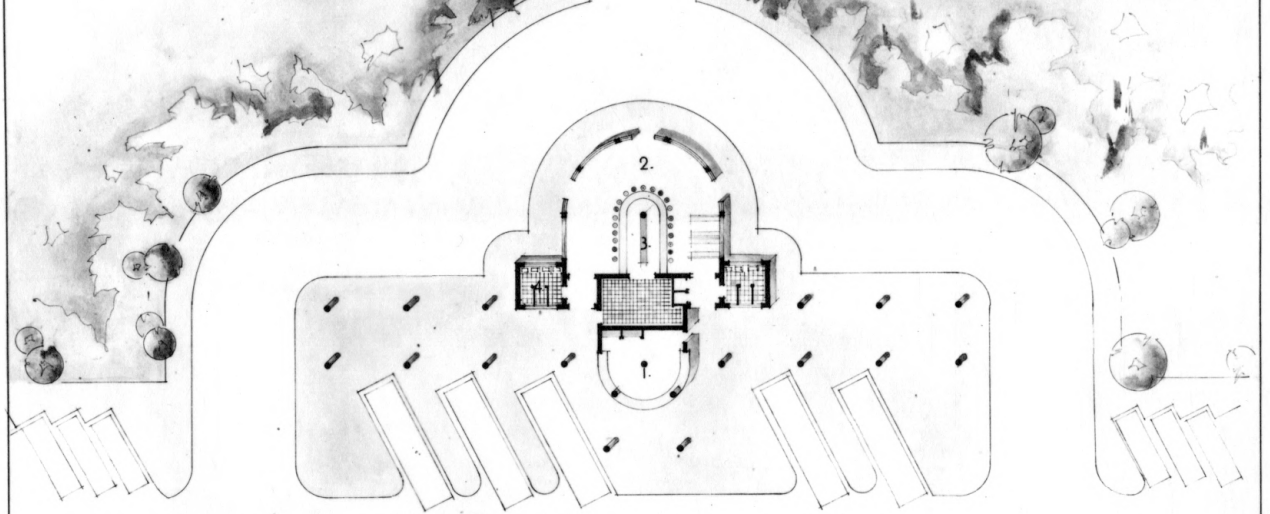
FRONT ELEVATION



SECTION

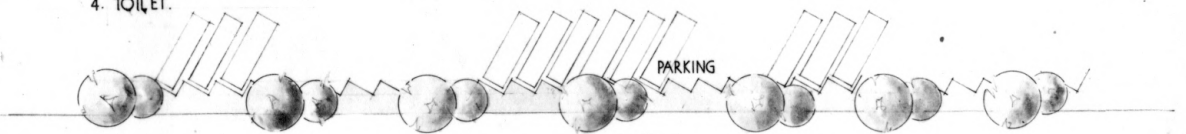


SIDE ELEVATION



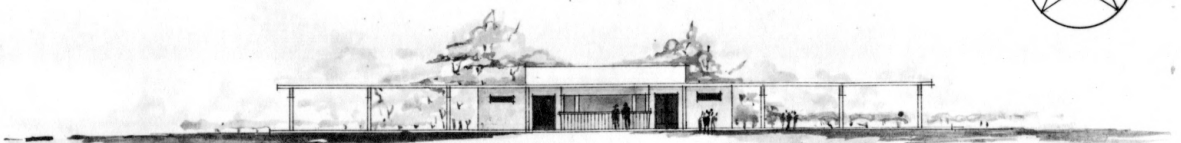
PLAN

- 1. TICKETS
- 2. WAITING ROOM
- 3. LUNCH COUNTER
- 4. TOILET.



PARKING

BUS STATION SC. 1:200



ELEVATION

J. H. Kamel
Dec. 1966.

THE SWIMMING BATHS

The present Baths of Helwan is a treating unit for some kinds of diseases which can be cured with the aid of the water of the springs. The bath house proper contains 60 rooms; each has a tub to be filled with the mineral water. In the garden, there is a pool 270 feet in length filled with sulphuric water which is kept running continually day and night.

The new building was designed in such a manner as to give the atmosphere of a recreation center besides being a health center. A new recreation facility can be provided by adding a swimming pool, with diving towers for those who can swim and for the beginners, the shallow pool. Two large round sanded areas can be used for sun baths. On the first floor there is a large terrace having three levels and a counter for serving refreshments and light meals. On the third floor there is a restaurant. A roof-garden can be connected to the restaurant, where food can be served both indoors and outdoors.

The arrangement of the different parts of the pool area is such as to enforce proper routing of bathers. After checking a basket, a bather goes through a corridor to a dressing cabin. After changing his clothes he goes through a second corridor leading to a room where he can keep his clothes. On his way to the pool entrance he should pass the toilets and the shower room. Some of the cabins can be rented for changing and keeping clothing. The building is divided into two sections relative to the main entrance. One of them can be limited to the use of the bathers using the swimming pool, and the other section for those who use the shal-

low pool. Elements required:

The first floor:

1. An entrance hall and a ticket counter.
2. Two offices for the manager and employees.
3. Toilets.
4. Basket checking rooms (one for each section).
5. Dressing cabins for ladies, of two types.
 - a. Cabins for changing and keeping clothes.
 - b. Cabins for changing clothes only.
6. A room for keeping the clothes.
7. Two toilets, one before reaching the shower room and the other for the bathers at the pool.
8. A shower room.
9. A large terrace provided with a lunch counter for serving refreshments.

The second floor:

The elements on the second floor are the same as those on the first. This floor is for men.

The third floor:

1. A dining hall.
2. A roof-garden type restaurant and cafe.
3. A service room.

The basement:

1. The machinery rooms.
2. Men's toilets.
3. The kitchen which serves the three floors by dumb-waiters.

Review of Data

The following is a review of swimming pool data in a report for the committee of Sanitary Engineers of the American Public Health Association.

Layout or arrangement of entrances and exits of the pool room in relation to dressing rooms, showers and toilets must be such as to enforce proper routing of bathers. Coming from the dressing room, a bather should be required to pass the toilets and go through the shower room before arriving at the pool entrance. Bathers should leave the pool through a separate exit leading to toilets and dressing rooms.

Pools used simultaneously by both sexes should have separate entrances and exits should be provided for men and women. There should be no connection between men's and women's quarters.

Entrances and exits must be located at shallow water portion of the pool.

Dimensions

Minimum depth of water in deep portion less than six feet.

Length less than 60 feet, width multiple of five feet.

Area of shallow water, five feet or less in depth, should be 80 per cent or more of total area.

Slope of bottom where water is less than six feet deep must not be more than one foot in 15 feet without any sudden change.

Side walls and end walls must be vertical.

Lining for bottom and sides up to runways must be of light-

colored material and present a smooth-finished surface without cracks or joints. All corners must be rounded.

Swimming lanes to be marked on the bottom with dark-colored material of the same kind as pool lining.

Depth of water at different depths to be marked on both sides.

Ten square feet per bather should be allowed.

All pools should be provided with an outlet at the deepest point of sufficient size to permit the pool to be completely drained in four hours or less.

Outlet opening in the floor of the pool should be at least four times the area of the discharge pipe to reduce suction currents. This opening must be covered with a proper grating.

In rectangular pools with deep water at or near one end, multiple outlets should be provided when the width of the pool is more than 20 feet. In such cases outlets should be spaced not more than 20 feet apart, nor more than 10 feet from side walls.

Proper pipe connections must be provided in recirculation pools to permit water being drained to the sewer as well as to recirculation pump.

No direct connections to sewers should be permitted, and all pool drains to sewers should be broken at a point where any sewage which may back up from the sewer will overflow to waste instead of being permitted to reach the pool. Pumping of pool drainage to an elevation above any possible sewer backing may in some cases be needed.

Where the distance across the shallow portion of the pool is

more than 20 feet, multiple inlets must be provided, so spaced that each inlet will serve a linear distance of not more than 20 feet.

Scum gutters should extend completely around the pool. The design of scum gutters should be such that matters entering them will not be wasted out by a sudden surge of entering water and that danger of bathers catching arms or feet in them be reduced to a minimum.

The edge of a scum gutter should be designed to serve as a hand hold for bathers. Gutters should therefore be sufficiently deep that bathers' fingers will not reach to the bottom. Sufficient opening must be provided to permit mechanical cleaning of the gutters.

Drainage outlets should be provided at least every 10 feet and the gutter bottom should pitch slightly to these outlets.

Runways not less than four feet wide should extend entirely around the pool. Runway floors should have a slope of about one fourth inch to the foot, should be smooth and easily cleaned but should be as far as possible of non-slip construction. At outdoor pools so located that much dirt is blown in from outside it is desirable to have the runways slope away from the pool to permit flushing such dirt directly to the sewers.

Some sanitary authorities also require a raised edge two inches or more in height between the pool and runways. Such an edge should be not less than one foot wide and at least six inches high in order that danger of accidental tripping may be reduced as much as possible.

There is no maximum width recommended. Some walkways are 40 inches in width.

Many pools have raised edges between the pool and the walkway. These vary in height from two inches to six inches or more and in width from 1 inch to 18 inches.

All outdoor pools should be completely fenced.

Dressing Rooms

Bath houses to be used simultaneously by both men and women should have two parts, one for each sex, entirely separated by tight partitions.

Floors of all dressing rooms and locker rooms should be of smooth-finished material, impervious to moisture, with no open cracks or joints. All floors should have a pitch of about one fourth inch to the foot and should slope to a proper drain to permit washing down with a hose. All junctions of the floors with side walls and partitions should be finished with rounded joints.

All furniture used in dressing rooms should be of simple character and of easily washable material. Lockers where provided should be of vermin-proof construction with tight joints. All lockers should be properly ventilated.

Showers, Toilets, Lavatories

The minimum number of showers provided should be in the portion of one for each 40 bathers expected at time of maximum load, in the case of continuous bathing.

Adequate and proper toilet facilities for each sex must be provided at all pools and beach bath houses. The minimum number should be one toilet for each 40 women and one toilet and one urinal for each 60 men. Urinals should be of a type that will not cause splashing of urine upon legs and feet of bathers. Urinals and toilets should be so located that bathers will use them before entering the showers on their way to the swimming pool.

Water flush toilets should be provided wherever possible. All toilets must be properly maintained.

Lavatories located adjacent to toilets should be provided at all swimming pools in the proportion of one bowl to each 60 persons using the pool at time of maximum load.

Lighting, Ventilation, Heating

A complete system of artificial lighting must be provided for all pools, bathing beaches, bath houses and dressing rooms which are to be used at night.

Lighting fixtures must be of such number and design as to light all parts of the swimming pool and the water therein.

Arrangement and design of lights must be such that life guards may see clearly every part of the bathing waters at a beach or pool, and all springboards, towers, floats and other appurtenances, without being blinded by the light.

Indoor pools should be so located that they may be lighted during the day by windows on at least one side or by skylight. The window or skylight area should not be less than one half the area of the pool, including the runways.

Submarine (or underwater) lights should be standard equipment on all pools. Such lights, in addition to their ornamental beauty and business-building value, supply unequaled visibility. Submarine lights can be installed in existing pools as well as new pools. Care should be taken to have a sufficient number of units to get the effect desired. In some pools with limited financial appropriations, submarine lights have been placed in the end and the side walls of the deep area.

Diving Towers, Springboards and Floats

Diving towers when provided shall be rigidly constructed and properly anchored to the bottom with sufficient bracing to insure stability under the heaviest possible load.

Fixed platforms and floats in the water shall be constructed with an air space of at least one foot beneath. There must be as little underwater construction in such platforms as is consistent with strength, and all braces, struts, etc., shall be designed to prevent entanglement or trapping of bathers beneath the platform.

At least 12 feet of free and unobstructed head room must be provided above diving boards and towers.

No diving board or platform more than 10 feet above water level should be permitted at any public place. The elevation of diving boards or towers should not exceed the safe limit for the average swimmer. The minimum safe depth of water for diving from various elevations:

Elevation of
Diving Platforms

Minimum Safe
Depth of Water

1 foot
3 feet
5 feet
7 feet
10 feet

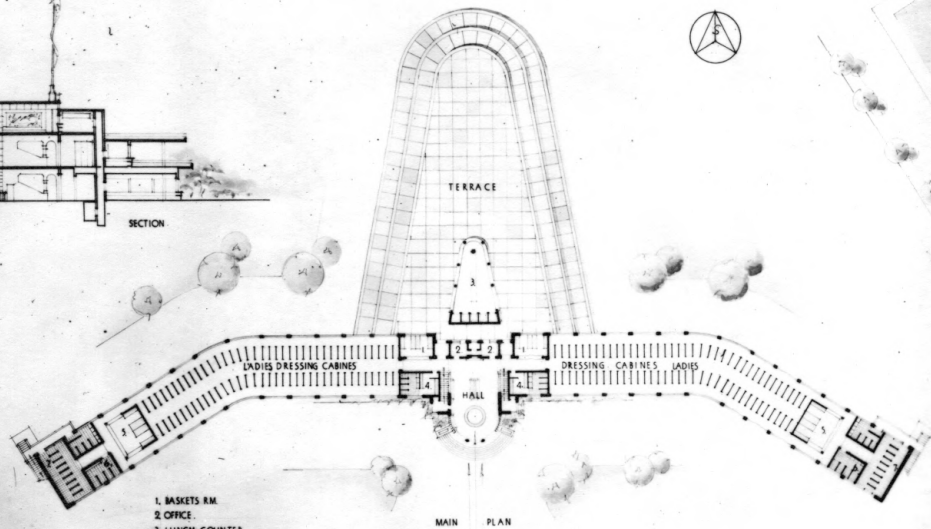
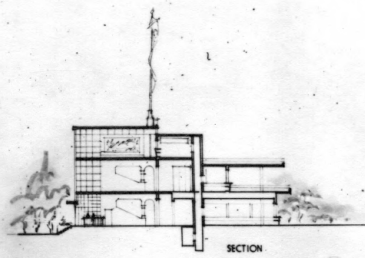
5 feet
6 feet
7 feet
8 feet
9 feet

Diving units to be placed on 12-foot centers. In cases of diving towers due to the numerous points of available take-offs, as well as varying lengths of take-off boards on the same tower, it is desirable to have such towers a minimum of 20 feet apart, with this 20-foot distance extending from the outermost part of tower base.

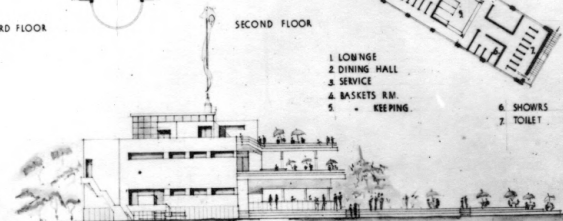
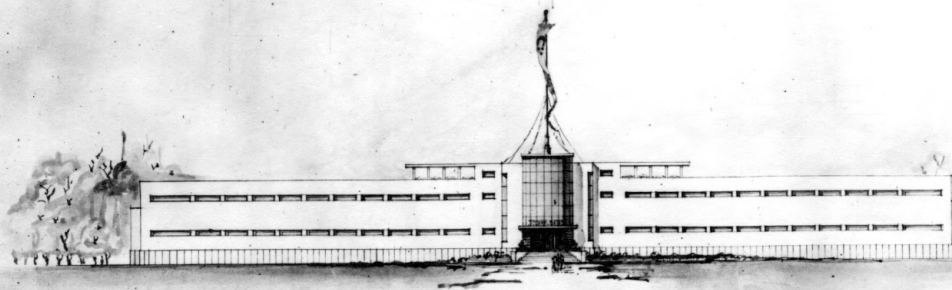
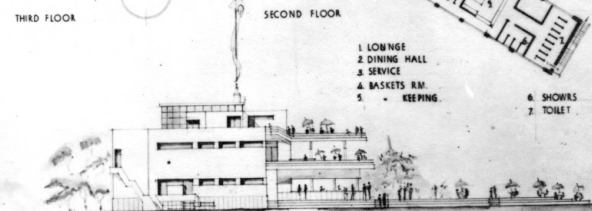
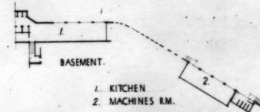
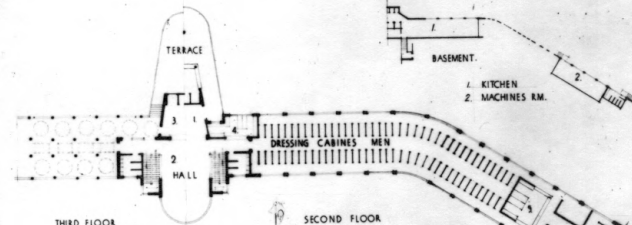
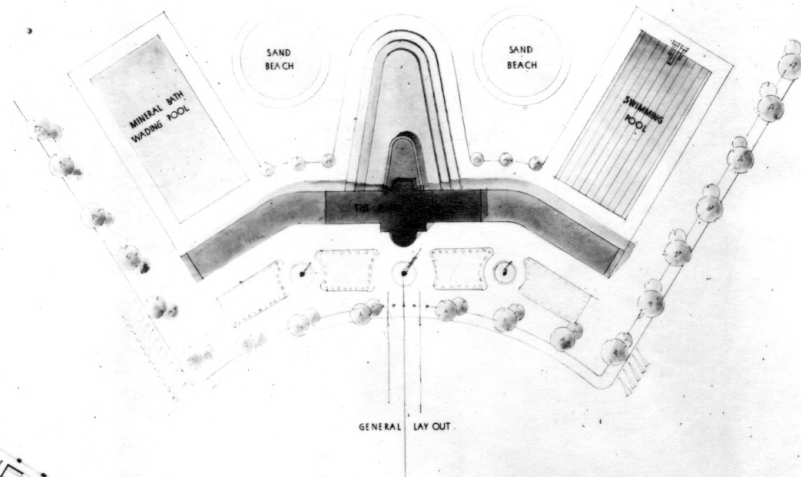
EXPLANATION OF PLATE V

The Swimming Baths

THE SWIMMING POOL



1. BASKETS R.M.
2. OFFICE.
3. LUNCH COUNTER.
4. POWDER R.M. & TOILET.
5. BASKETS KEEPING R.M.
6. TOILETS.
7. SHOWERS.



J. F. Kneel
Dec. 1925

APARTMENT BUILDINGS, TYPE A

The study of this type of apartment building gave one of the solutions for solving the problem of housing. The solution was based on releasing the planning from the restrictions of the narrow limited lot and the organization of a considerable area in an interrelated manner permitting the individual living spaces to be squared up in building areas not more than two rooms deep with relation to the frontage or principal exposure of each building unit. The objectionable light courts were avoided.

Each apartment building consists of three floors with six apartments on each floor. Providing a staircase for each two apartments, every apartment is exposed to three directions. The frontage of the building is exposed to the prevailing wind. The southern portion of the building is protected from the sun by the overhanging balconies. As the angle of sun rays increases in the summer and decreases in the winter, the balconies give the best solution for allowing the sun rays to penetrate when they are needed, only in winter time.

Each apartment contains a living room, a dining alcove close to the kitchen, two or three bedrooms and a bathroom. On the top roof there is a laundry room for each apartment and an open space for drying the clothes.

EXPLANATION OF PLATE VI

An Apartment Building, Type A

APARTMENT BUILDING TYPE 'A'

- L. LIVING ROOM.
- D. DINING ALCOVE.
- B. BED ROOM.
- K. KITCHEN.
- N. LAUNDRY ROOM.

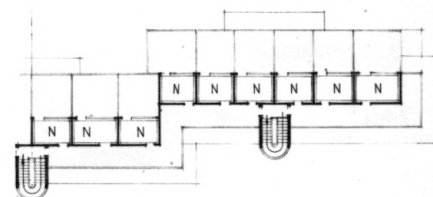
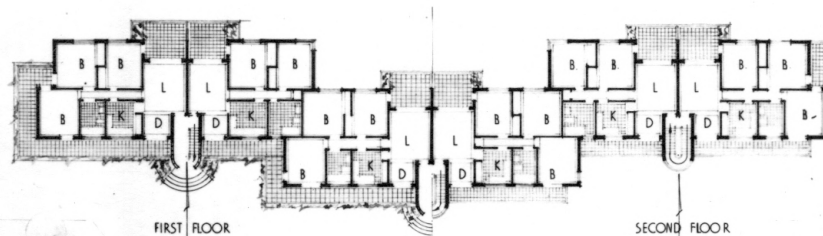
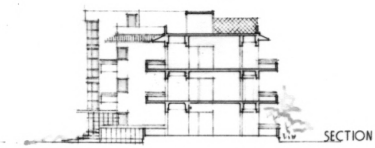
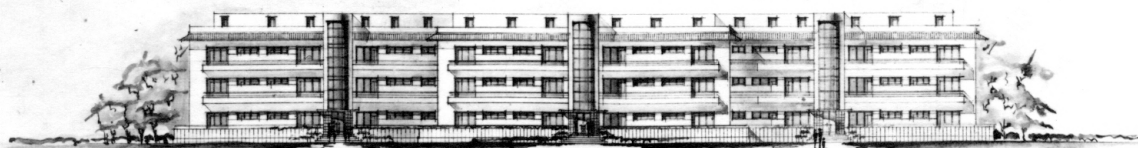


PLATE VI



ELEVATION

SECTION

J. F. Kramel
Dec. 1966.

APARTMENT BUILDINGS, TYPE B

Sometimes people prefer to live in private houses of two stories rather than to live in an apartment of one story. Two-story apartment buildings provide apartments of two stories at low rent according to standardization and repetition of elements. On the first floor there are a living room, a dining room, a toilet, a kitchen and a staircase leading to three bedrooms, a bath and half bath on the second floor. The building has two separate staircases; every one leads to four apartments, two on each floor. For each apartment there is a laundry room on the roof.

(Review of the factors selected from the detailed statement of the factors to be dealt with in housing development, as given by Henry Wright, 1935, in his book, "Rehousing Urban America.")

List of site-planning requirements:

- I. Adjustment of buildings and circulation to distinctive topographic features.
 - A. Conformation of land.
 - B. Trees or other landscape features.
- II. Orientation and openness of buildings in relation to
 - A. Sunlight.
 - B. Prevailing winds (ventilation, dust, odors).
 - C. Outlook, awareness of space.
 - D. Outside, noise and reflection in courts.
- III. Circulation.
 - A. Circulation to and from outside points.
 - 1. Relation of main entrances to principal long distance

approaches, accessibility to transportation and to place of work.

2. Relation of main entrances to approaches from stores, garages, schools, churches and playgrounds.
3. Directness of approaches to the entrances of various units.

IV. Planting and landscaping.

A. Relation to

1. Architectural plan of building.
2. Vistas, visibility and clarity.
3. Trees, rock formation, etc.
4. Maintenance use by many people, and upkeep.

V. Services embodied in the site.

A. Automobile storage.

1. Parking.
2. Garages.

B. Play and recreational space.

1. For (a) younger children, (b) older children, (c) adults.
2. Limitation on account of noise.

C. Stores.

Analysis and Comparison of Building Units

Size Standards. The effective size of a room should not be considered in terms of square feet only, but should include its shape, relation to windows, furniture, amount of room for circulation and access.

Area. This must be considered with respect to the individual room and its relation to other rooms, e. g., if a bedroom is large, the space for the living room is proportionately smaller; an extreme example would be an apartment in which one bedroom is as large as the living room, while a minimum total area is the object.

Shape. Specific rooms may be square or rectangular but the room must not be too deep from the lighted wall.

Story and Ceiling Heights

For minimum size apartments in the New York area, a change in the building code, about 1923, permitted ceiling heights of eight feet, which has become usual in this area. Although this is regarded as adequate, we must recognize conditions in various climates, and the fact that the ceiling height has a relation to the size of the room, although in certain architectural treatments, low ceilings for large rooms have been found to be effective.

The actual differential cost in the height factors is not a sufficient factor to suggest a reduction in the ceiling height below an agreeable minimum but there is always the factor of the added stairs to be climbed and, in an effort to produce livable low-cost housing, no items of expense or quality, however small, should be ignored.

Standardization and Repetition of Plan Elements

Standardization of Equipped Rooms. The reduction of the ex-

pense and maintenance of mechanical equipment is the greatest structural factor in the endeavor to produce low-cost housing. Standardization and identical repetition of bathrooms and kitchens throughout a project and care in locating the service lines leading to them will appreciably reduce their cost. Though at the present time the juxtaposition of bathroom and kitchen of assembled fixtures is not highly significant, an important saving can be made in the future by the development of bath and kitchen equipment placed back to back and manufactured in a single unit.

Open Stairs

The possibilities of open air stairways as a means of economy in planning and possible economy in maintenance have been very little explored in this country (U. S. A.).

In England and on the Continent it is common practice to leave the stairways uninclosed, and to run exterior-hung balconies to serve as corridors. Economies in maintenance are probable with this management but climatic conditions and light obstruction must be carefully studied; they are probably the greatest limitations of this scheme. The danger of wind and exposure becomes increasingly serious with an increase in height; if possible, the balconies and stairways should be placed in a protected spot. There is no valid reason why a person should be less exposed to the elements in passing from the ground to his apartment door, than he was in approaching the building from the street, but he should definitely not be more exposed. There must be double-door foyers. It might be possible to arrange a temporary covering for

use in the inclement months of the year, though this of course would add to the building cost and make maintenance more expensive. Reduced maintenance in the open-stair and balcony building arises directly from its openness; its maintenance is partly dependent on the same factors as the wind and rain on a sidewalk, and any attempt to inclose it partially defeats its purpose proportionately.

Fire Escapes

The status of fire escapes is in evolution and needs study. The theory of stairs offering double exit by means of the roof has been applied in Chicago to eliminate fire escapes or second inclosed stair for four or five stories, and in the two large units of the Phipps apartments it was found more economical to provide the second inside stair than to build an exterior fire escape.

Lobbies

Large ostentatious lobbies are costly in construction, maintenance, and space, and disrupt the ground-floor plan. Simple, direct stair-hall entrances are much to be preferred.

Basic Services Affecting Plan Organization

Deliveries. Commodities to be received are: milk, ice, food-stuffs and perishables, general merchandise, furniture and mail. Every plan organization should be checked in detail for the service requirements of these commodities, including size of passages for furniture, and distance from street and convenience of location of mail boxes.

The common delivery facilities and their characteristics are:

Dumb-waiter. Its objectionable phases are: noise of operation at inconvenient hours; lack of privacy when shared, and additional expense.

Corridor Delivery. There is danger of theft and of cluttering the halls unless receptacles are provided, and the presence of deliverymen in the halls is objectionable.

Central Reception Service. An additional operating expense may be admissible when a project is large enough to have a resident management office, or in small projects with superintendent's office, elevator attendant or other reception at the principal entrance. There is confusion for tenant and deliveryman unless the reception office is uniformly responsible for receiving and forwarding all deliveries, and the relaying of bulky and heavy goods to the tenant is a problem. Perishables entail need for a refrigerator in the reception office unless it is assured that perishables will be personally carried by the tenant when at home.

Garbage and Refuse Disposal

Arbitrary hours of collection, noise and unsanitary conditions caused by garbage and refuse removed by means of dumb-waiters are objectionable. The use of an incinerator provides freedom from this, but entails the danger of smoke and odor nuisance and is conducive to poorly kept public halls (when incinerators are placed therein) and to difficulty in roof treatment; it also entails raised costs when shared by too few suites. The use of both

mechanical refrigeration and an incinerator removes the need for a dumb-waiter.

Rooms: Number, Type, Problems of Organization and Size

Size Policy. If the average space available for rooms is small, the best results may be obtained by mingling large and small rooms, a large living room, with bedrooms and "equipped" rooms as compact as possible.

The use of fewer rooms, but those rooms planned for double uses, such as kitchen-dinettes, and living rooms used also for sleeping, is advantageous in some circumstances for the preservation of desirable size standards. This must be the result of a thorough plan study to efficiently meet all needs. The fact has been recognized that the smaller the apartment the more functions each room must have, but solutions thus far have not been entirely creditable.

Living Room

It has been considered important to locate living rooms in close proximity to entrance halls to minimize the extent of foyers or inside halls. This, however, entails the penalty of keeping the living rooms away from corner or end locations, with double or triple exposures. It is hoped that new plan developments or a workable analysis of efficiency as quality will solve the dilemma.

The living room is frequently subjected to use for sleeping also. This practice is carried to excess where, by the use of closet beds, it is made to perform the functions of a full second

bedroom, and, in cases where an apartment has no bedrooms, nevertheless it has a full dining room and kitchen. One full bedroom, to be used for nothing but sleeping purposes, is the desirable minimum for all apartments except the smallest. As a regular routine sleeping in the living room presents the following problems:

Limited hours for persons choosing to occupy the living room for other than sleeping purposes, lack of privacy and direct access to bath, provision of adjacent clothes closet space, limited space for furniture placement on account of encroachment by bed. It should be realized that the use of daybeds offers an arrangement of greater flexibility than the use of closet beds, and space saved by eliminating the closets can be thrown into the living room proper.

Living rooms should usually be rectangular, but not too elongated from the lighted wall.

Bedroom

The minimum width of bedrooms is often determined by the length of a bed perpendicular to the wall, plus adequate passage space, and can then be not less than nine feet. In the case of a minor bedroom furnished with a single bed parallel to the wall, a narrower width can be safely used.

The usual limitation of space in a bedroom makes imperative a convenient and efficient furniture arrangement. Beds in relation to the swing of the door should be shown on plans. Bedrooms with only one window should be avoided and windows should be so related to wall space for dressers that one corner can be kept

where a chair may be placed next to a window with an outlook.

The area of the windows must be sufficient to provide adequate light for dressing, reading, sewing, and for ventilation at night. Bedroom closets should be ample for expected occupancy and should seldom be placed outside the bedroom. It is highly desirable to have two separate closets for a room to be occupied by two people. The most efficient shape for a closet is shallow and wide.

Dining Room

The subject of the omission of dining rooms in low-cost housing is worthy of careful consideration. Adjustments must be made, however, to compensate for the dining room and must be studied in relation to the furniture layout of the other rooms, as well as to the short circulation necessary from the kitchen to the serving place.

Kitchen

It is agreed by home economics authorities and housewives that a relatively narrow shape of kitchen makes for a saving of steps, since equipment ranging along either wall may be reached without walking. A width of seven feet, two inches finished is the minimum to allow for standard dressers on one wall, full-size range on opposite wall, and space between for working and for the passage of two persons. Some slight departure from the maximum working efficiency may be tolerated to provide an agreeable dining corner in a more nearly square kitchen.

The location of doors and their swing must be carefully studied to avoid disturbance of the work area.

Small apartments usually require few deliveries and since the deliveries presumably take place when no formal guests are present, there is no particular need to have the kitchen located next to the foyer. With a small kitchen, and dining space in the living room, more than a single door into the kitchen is unessential and makes for a complication of equipment which is inconvenient without a maid.

Bathrooms

The location of the tub is the determining factor in planning a bathroom. Placing the tub across the narrow end under a window gives not only the most compact arrangement, but groups all supply lines and drains under one wall, avoiding the necessity of added expense of maintenance and repair. Recently developed, entirely practical, wall-hung closet fixture decreases projection of this fixture into the room, and a special bathtub fixture with a side outlet provides a five-foot tub with a width of only four feet, six inches for the remainder of the space.

Closets and Storage Space

A desirable standard as to the number of closets is one closet per person in bedroom, separate linen closet in hall or bathroom, coat closet in foyer or living room, broom closet included with kitchen cabinets, and one extra closet for general storage and luggage, bridge tables, roller skates, etc.

The depth of closet should never be less than 22 inches finished, the minimum necessary for clothes on hangers. Lighting of

closets should be considered in relation to the swing of closet door to the window and nearest electric outlet. One shelf above the clothes pole is considered standard.

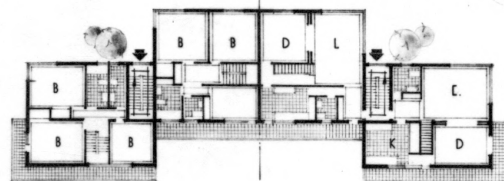
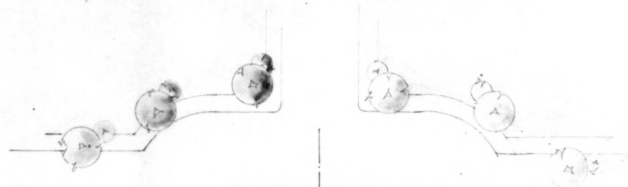
Foyer and Hall

In order to absorb waste space in the plan, these are usually made too large. Their function is to receive guests and to furnish access to bedrooms and baths without crossing the living room. All passages must be large enough for the introduction or removal of all furniture.

EXPLANATION OF PLATE VII

An Apartment Building, Type B

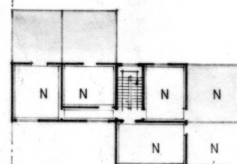
APARTMENT BUILDING TYPE 'B'



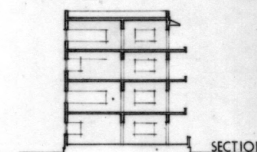
SECOND FLOOR

FIRST FLOOR

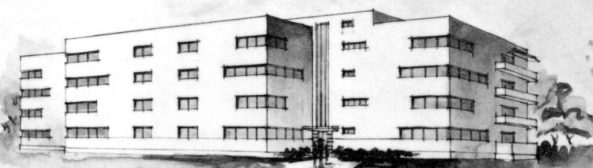
- L. LIVING ROOM
- D. DINING ROOM
- B. BED ROOM
- K. KITCHEN
- N. LAUNDRY ROOM



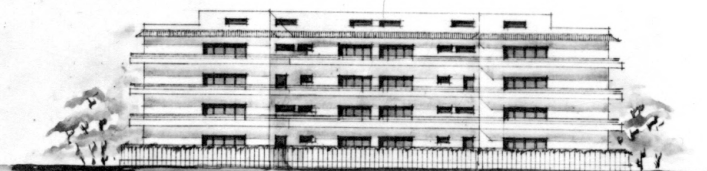
FIFTH FLOOR



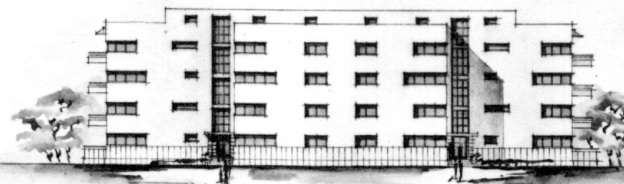
SECTION



PERSPECTIVE



REAR ELEVATION



FRONT ELEVATION

J. J. Karch
Dec. 1946.

THE MOSQUE

In the year 633 the Arabs conquered Egypt and spread the Islamic religion. In considering places for their religious services, the Egyptians started to build mosques. A new style appeared and began to increase according to the development of the mosques. This style gave the start to the Arabic architecture which is sometimes called the Islamic or Mohammedan architecture.

The first mosque was built in the year 641. In 876 the mosque of Ibn Toloon was built and was composed of an open court surrounded by ewans in the form of arcading. The east ewan was composed of four rows of arcading. The arches were supported on piers; each pier had four attached columns. The mosque had a minaret adjoining the outside wall. The outside walls were provided with high windows. The roof was built of timber and had a flat form. A few years later, the mosque of Sultan Hassan was built; it was composed of an open court around which were four vaulted ewans. In 1474 the mosque of Sultan Kaid Bey was built, having an entrance porch, flat ceiling and octagonal lantern in the middle, an elegant minaret with beautiful carving and a tomb chamber with a dome. According to religious traditions, all the mosques have a separate entrance for ladies, and a staircase leads to a mezzanine having the shape of a balcony supported by columns. Another feature of the mosques is the Kebla, which is a niche facing Mekka. Near the Kebla is a high stand with a few steps leading to it, made of timber, called a member, where the

speeches are given. The minaret is a tower ending with a balcony from which callings for praying are given. The other elements are an office and men's and ladies' toilets.

EXPLANATION OF PLATE VIII

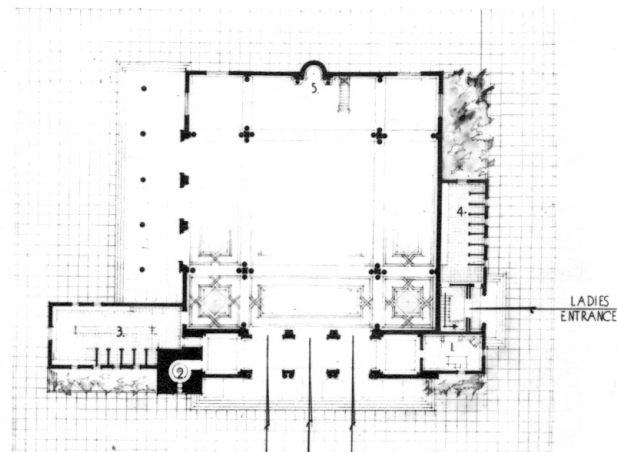
The Mosque

المسجد

THE MOSQUE.

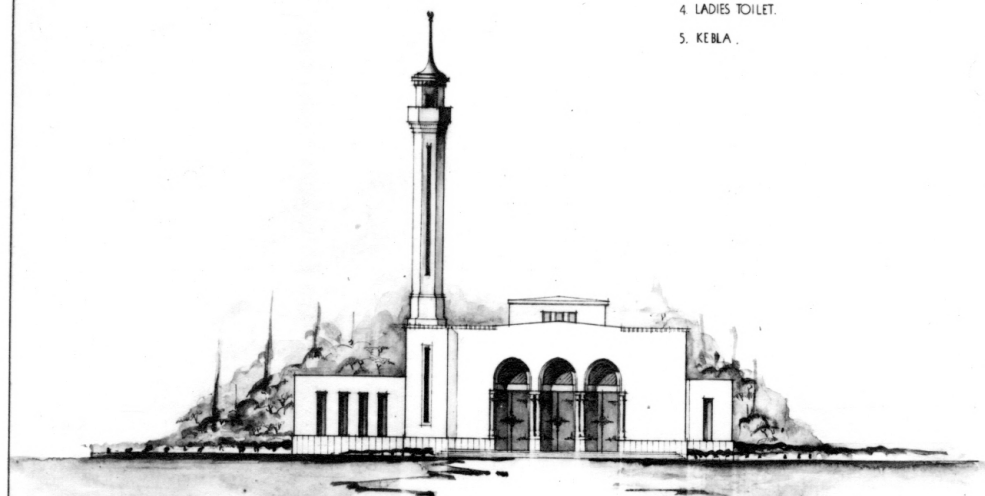


- 1. OFFICE.
- 2. MINARET ELEVATOR.
- 3. MEN TOILET.
- 4. LADIES TOILET.
- 5. KERBA.

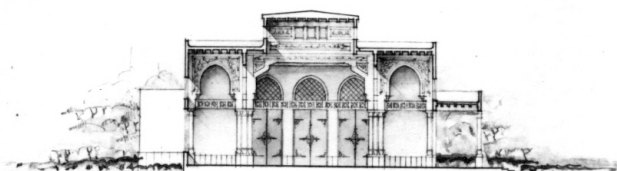


LADIES
ENTRANCE

PLAN.



ELEVATION.



SECTION.

PLATE VIII

A. H. Khamis
Dec. 1946.

THE SCHOOL

The climatic conditions at the city of Helwan affected the design to a great extent. The classroom unit was raised on columns providing a shaded protected area for sitting and playing during the lunch break, for giving outdoor classes and it could also be used as a place for watching the games. The classrooms had wide openings facing the north for the light and keeping them cool. A toilet and locker recess was provided for each classroom. Windows facing the south were high and small with adjustable asbestos sheets to adjust the amount of sun needed.

The second unit was the dining hall connected to a kitchen. Providing a stage, the hall could be used as an assembly hall and for music exercises, physical training, cinema and lantern slide lectures. Also it could be used as a meeting place for parents and children. Elements required:

The ground floor:

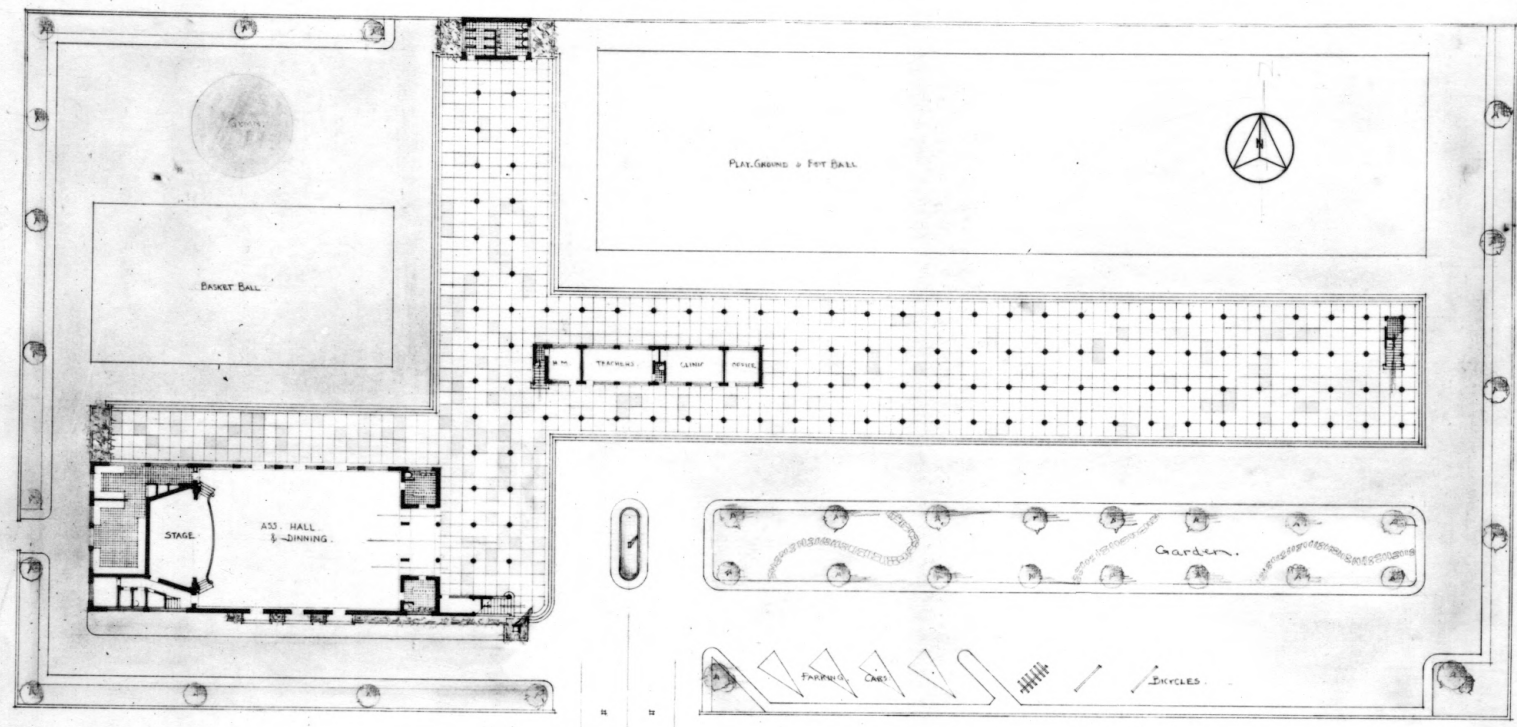
1. Rooms for the head-master, the teachers and employees.
2. A clinic.
3. Toilets where necessary.
4. An assembly and dining hall.
5. A stage.
6. Dressing rooms and storage area (could be located in a basement.
7. A kitchen and a service room.
8. Playing field for basketball games and football training.
9. Parking areas for cars and bicycles.

The first floor:

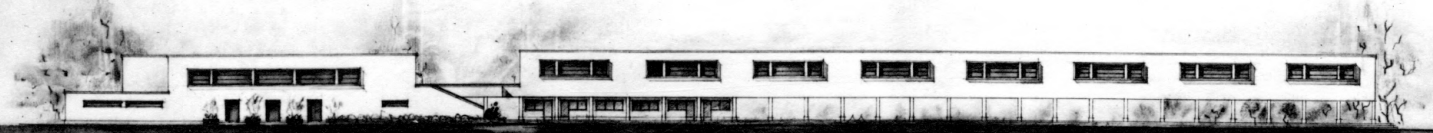
1. Six classrooms, each having a toilet and locker recess.
2. Two craftrooms.
3. A projector room for the assembly hall.

EXPLANATION OF PLATES IX AND X

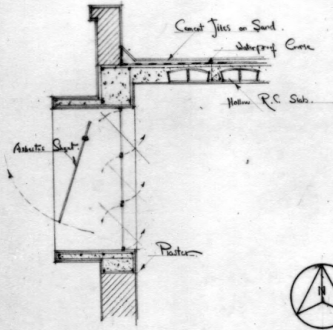
The School



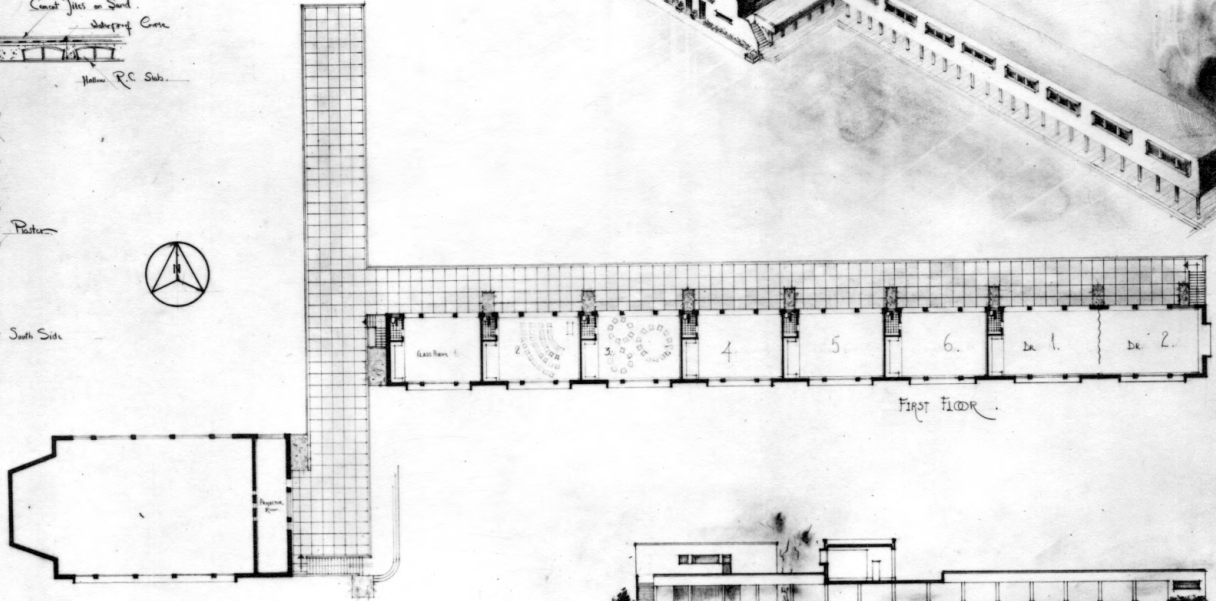
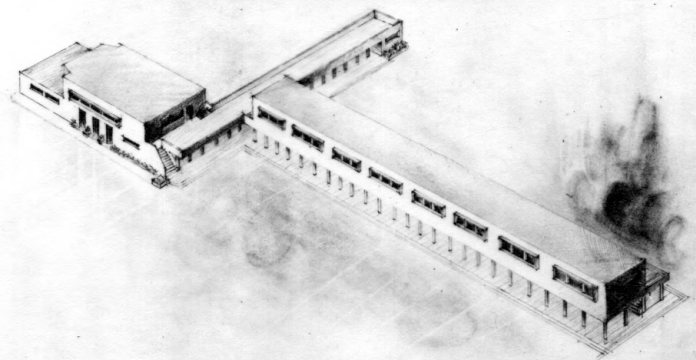
A PRIMARY SCHOOL



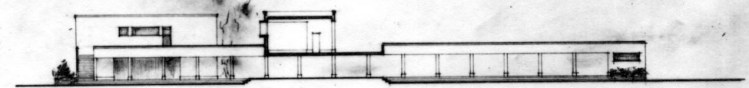
A. H. KAMEL.



DETAILS of WINDOW of South Side

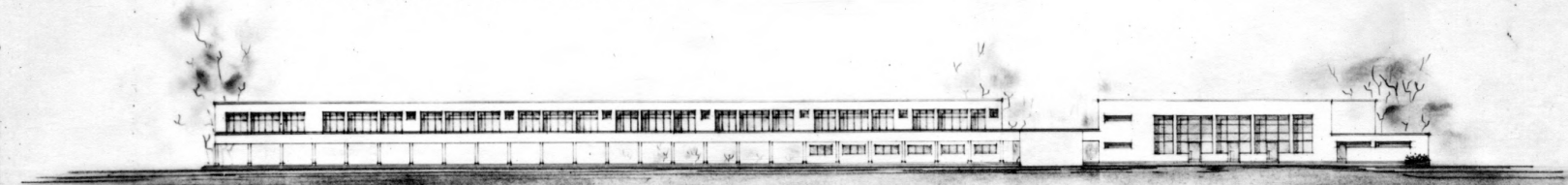


FIRST FLOOR



Side Elevation

A PRIMARY SCHOOL. S.C. 1:16



A. H. KAMEL
1946

A PRIVATE HOUSE

It was assumed that a doctor required a residence occupying one of the new lots at the new west extension of the city. The plans were studied to fulfill certain requirements taking into consideration the climatic and social conditions. Elements required:

The ground floor:

1. A playing room for ping-pong and billiard games.
2. A bar connected to the kitchen.
3. A kitchen and a storage room.
4. A laundry room.
5. Two rooms for servants and a bathroom.
6. A garage for three cars.

The second floor:

1. An entrance lobby, a recess for coats and a toilet.
2. A study room connected to a library opening to a veranda.
3. A reception room.
4. A dining room.
5. A living room.
6. A terrace provided with a small pool and fountain.
7. A service room connected to the kitchen with a dumb-waiter.

The third floor:

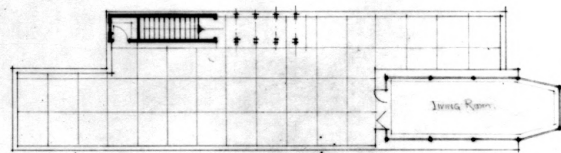
1. The master bedroom, a dressing area and a bathroom.
2. Three bedrooms with a bathroom for each.
3. A breakfast room.
4. Balconies.

Top floor:

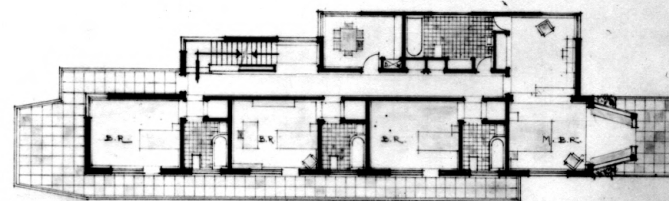
1. A living room provided with wide glass openings.
2. A roof garden.

EXPLANATION OF PLATES XI, XII AND XIII

A Private House

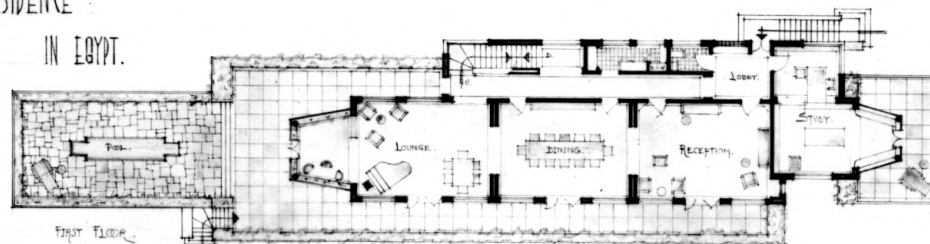


ROOF PLAN

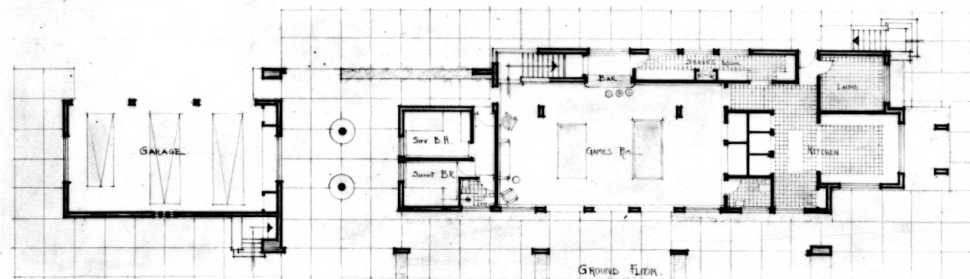


SECOND FLOOR

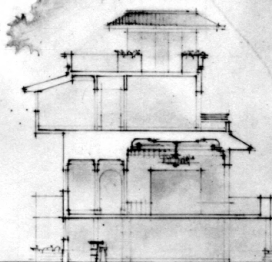
A DOCTOR'S RESIDENCE
IN EGYPT.



FIRST FLOOR
S.C. 1-8'

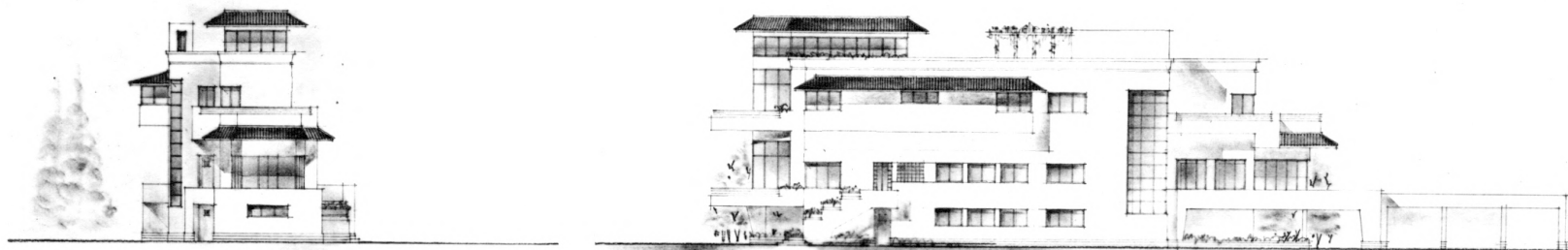


GROUND FLOOR

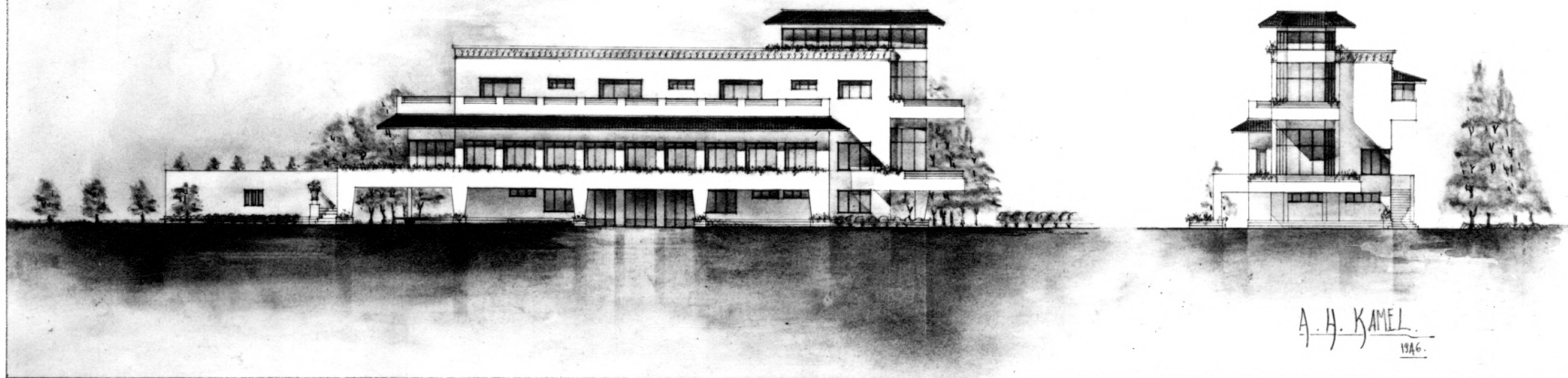


SECTION

A. H. KAMEL
1946



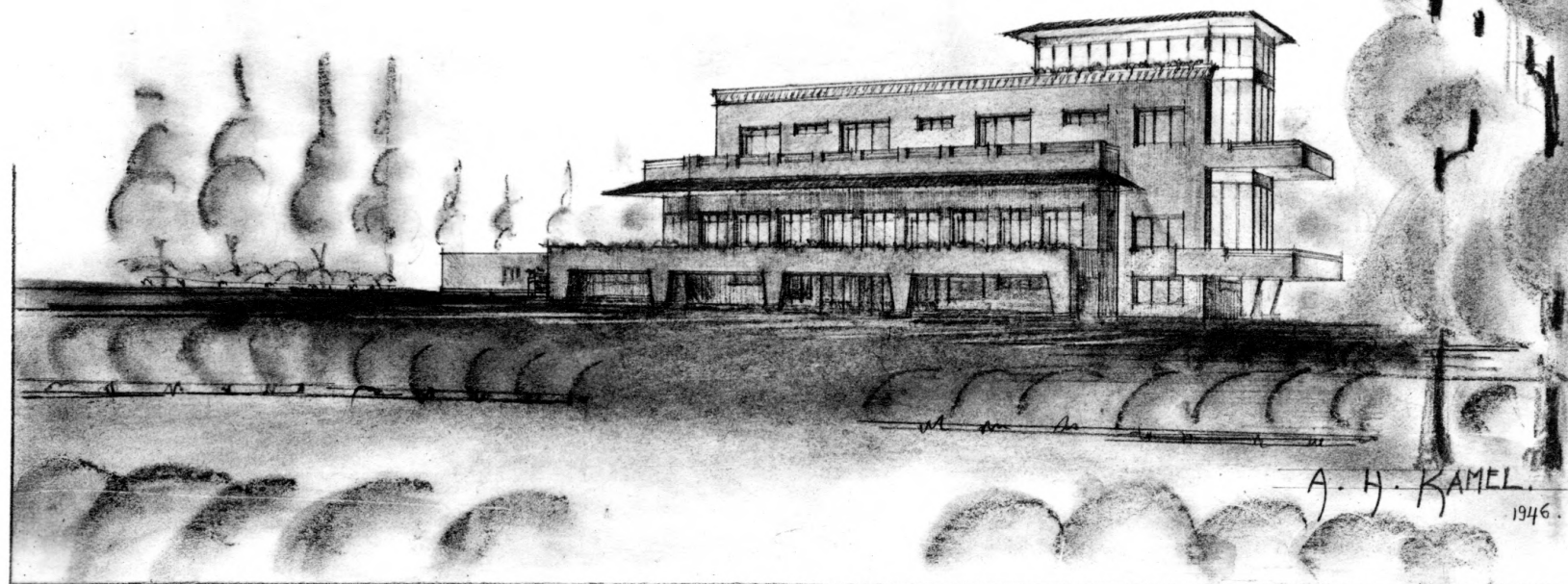
A DOCTOR'S RESIDENCE
IN EGYPT

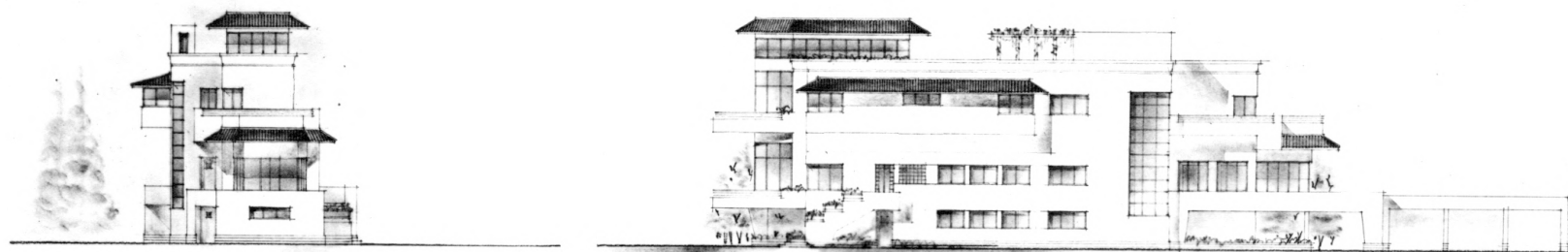


A. H. KAMEL
1946.

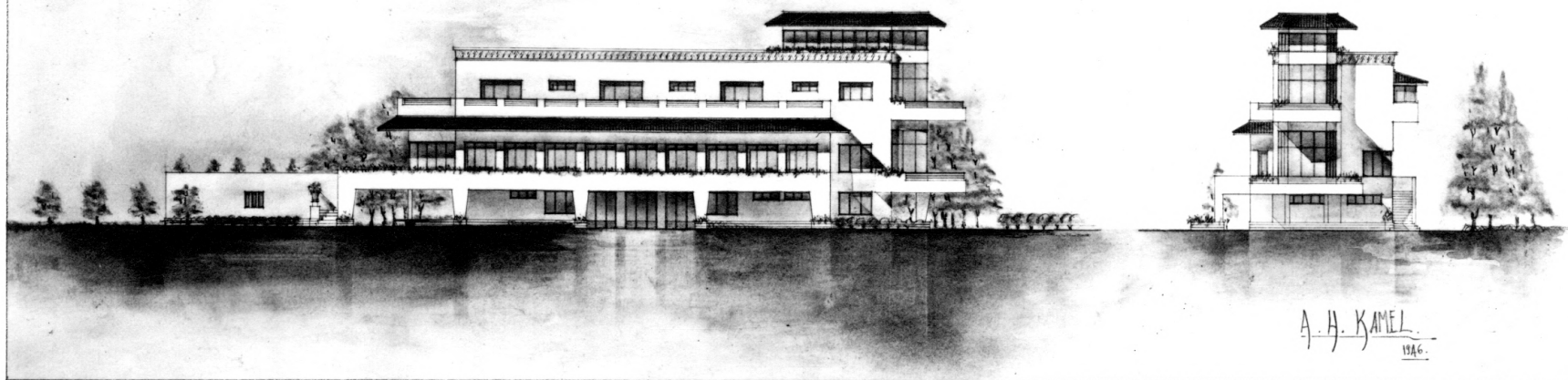
A DOCTOR'S RESIDENCE

IN EGYPT.





A DOCTOR'S RESIDENCE
IN EGYPT



THE CAFE-RESTAURANT

This building is a combination of a cafe and a restaurant. In Egypt, a cafe is a place for individual meetings, where people can meet each other to spend part of their leisure time talking or playing games. It is more or less a club. During the warm weather, people always prefer to stay outside on terraces than to stay inside the building. The building, as shown on Plate XIV, was designed to fit several purposes. On the first floor, there is the main unit, which is the cafe. It consists of three parts. The first part is a large circular hall provided with wide glass doors, a dance floor in the middle, a stage for the band and a bar. This part opens to the second part, which has a shed supported by columns forming a shaded terrace. The third part is the open terrace at a lower level. The first part can be separated from the other parts by closing the doors and an admission can be charged. The second unit is the restaurant provided with a lunch counter in the middle. The third unit is the kitchen, serving both units. On the second floor there is a terrace extending to form a balcony overlooking the closed part of the cafe. Above the restaurant is a roof restaurant. On the third floor a terrace is provided with an open stage for private parties. Elements required:

The first floor:

1. A cafe partly closed.
2. A dance floor in the middle of the closed part.
3. A stage.
4. A restaurant provided with a lunch counter.

5. A kitchen to serve both cafe and restaurant.

6. Offices for the manager and employees (may be located on a mezzanine floor).

7. Toilets for ladies and gentlemen wherever needed.

8. Telephone booths.

The second floor:

1. A roof restaurant.

2. A terrace to be used as a cafe.

3. A kitchen for serving both units.

4. Toilets.

The third floor:

1. A terrace for private parties.

2. A checking room.

3. A small bar.

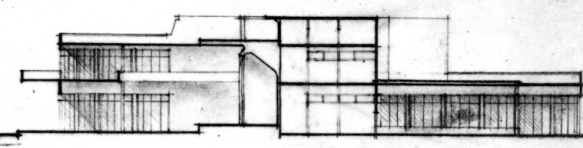
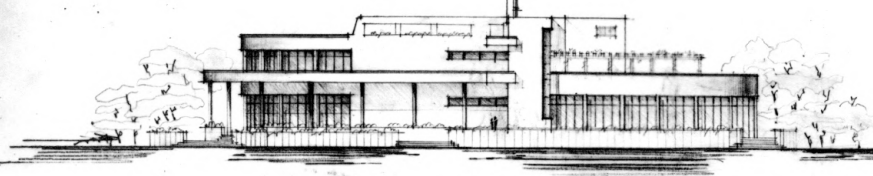
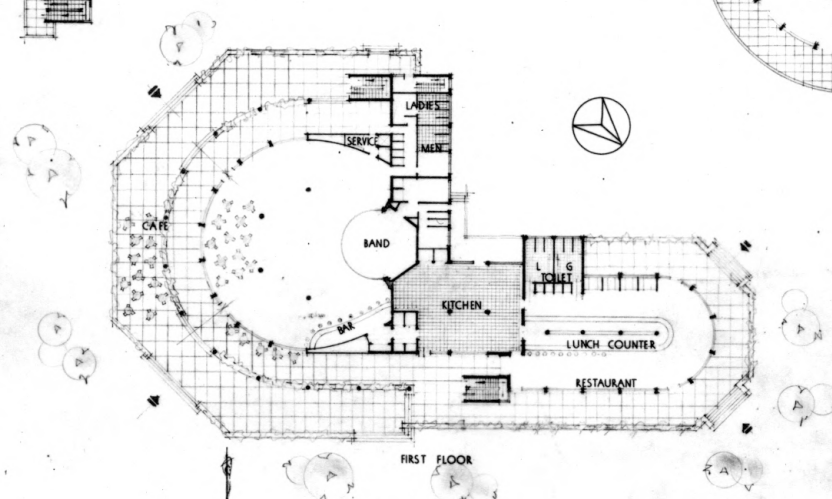
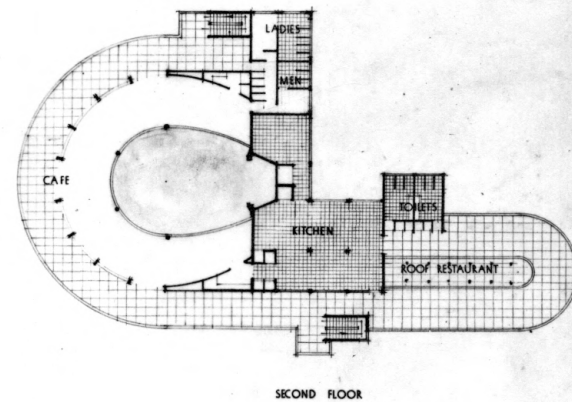
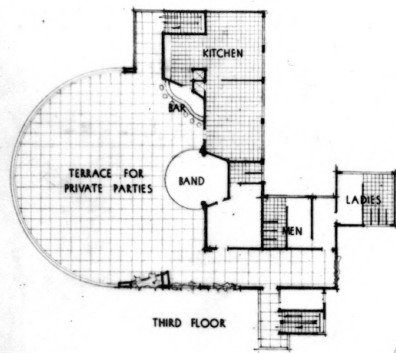
4. A kitchen and dumb-waiters connecting the kitchens on the three floors.

EXPLANATION OF PLATE XIV

The Cafe-Restaurant

THE CAFE-RESTAURANT

SCALE 0 6 12 30 FEET



J. J. Kneel
Dec. 1921

CONCLUSION

The development of the studied project will give the city of Helwan what it needs as a modern health resort having an international reputation. New additions were planned and added for the future extension of the city, recreational facilities properly located, breathing spaces and parks distributed among all parts of the city, residences well exposed to the air and light provided with gardens and playing areas for children far from the traffic, buildings with proper orientation, and among all the city of Helwan will be the order and beauty it needs.

ACKNOWLEDGMENT

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