

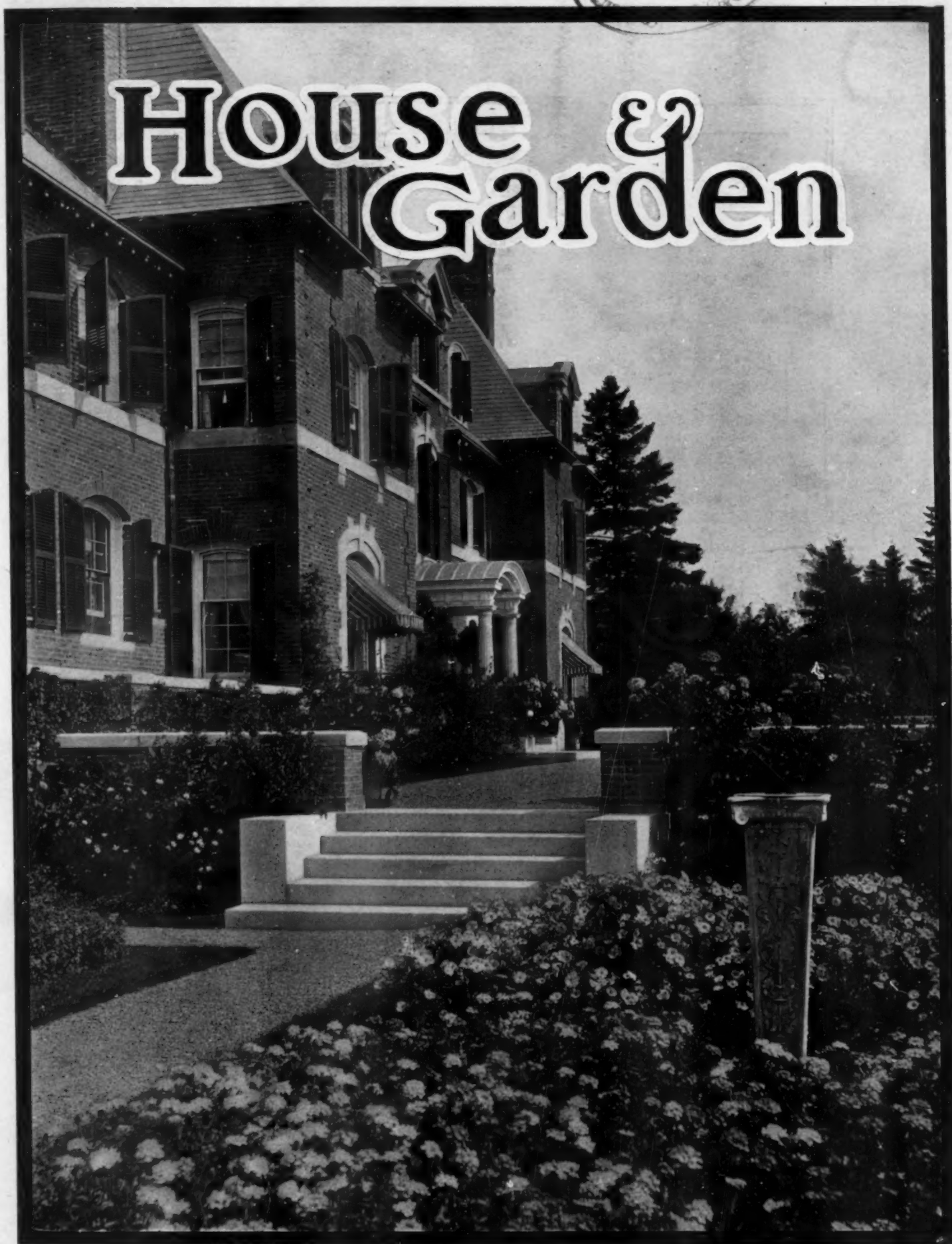
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APRIL, 1906

No. 4



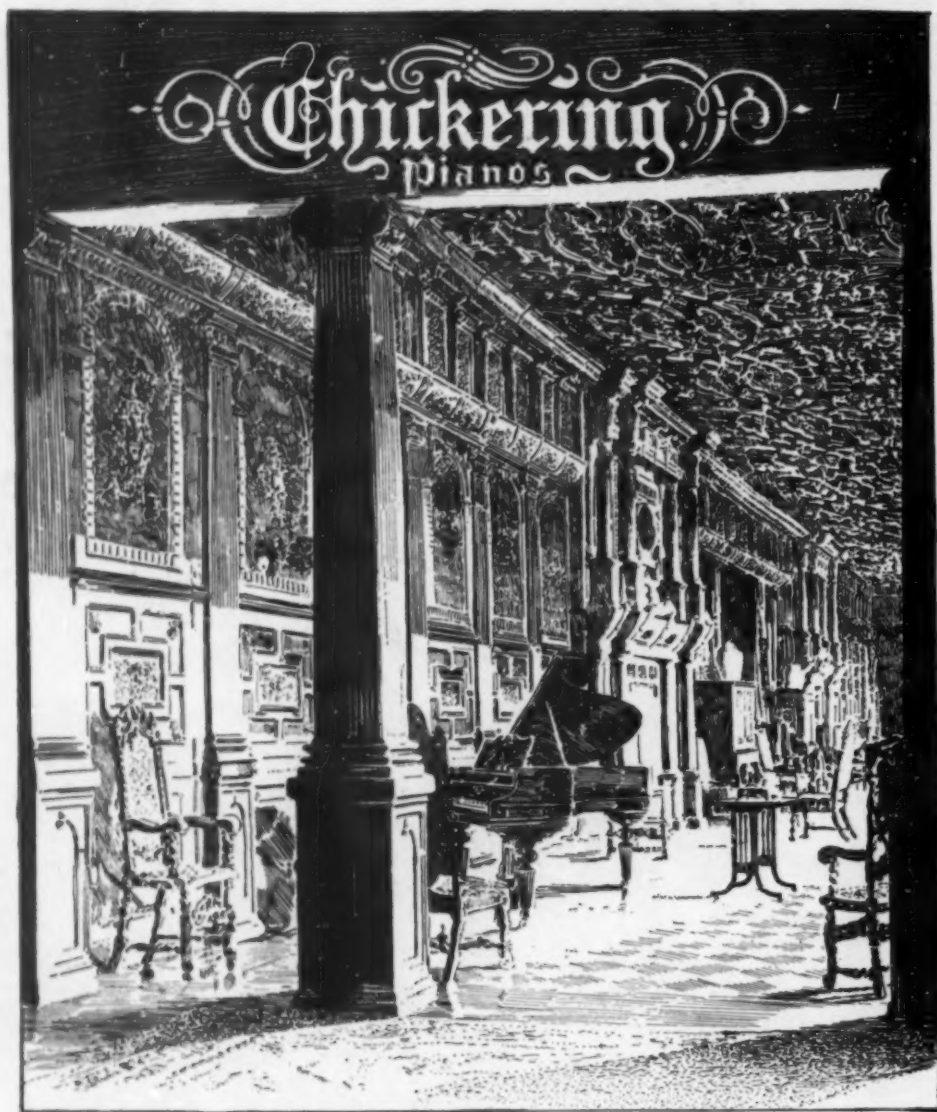
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APPROACH TO MR. FREDERICK LAW OLMSTED'S HOUSE AT BROOKLINE, MASSACHUSETTS

Illustrating one of the vine effects referred to in Mr. Rexford's article on page 178

House and Garden

Vol. IX

April, 1906

No. 4

THE PRIVATE GARAGE

ITS DESIGN, ARRANGEMENT AND COST

By I. HOWLAND JONES

THE most modern problem that the architect has to face is the private garage. Motoring enthusiasm has spread so widely that many country house owners, even if horse lovers and possessors of a stable, have at least one machine. And the inaccessibility of public garages in this country being marked to a degree, as every motor tourist can testify feelingly, the inevitable need of one's own becomes imperative. And a very picturesque little one it may be, too.

When the problem first presented itself the private garage was made a mere shed with possibly a work-bench at one end, but latterly they have been developed until they are now as carefully planned and as well adapted to their use as the best of the modern buildings on our country estates.

There are several important matters which should be given careful consideration in the building of an automobile house, and a description of a few of the more recent ones with some suggestions upon the planning of them may be of interest. As a first consideration it is never wise to plan a building with only room enough to take one car, as the additional cost of making it large enough for two is so very little that the extra expense is always justified. Although it may seem to the beginner in this sport that he will never need to put up more than one car at a time, he will soon find that for some reason there is another car to be looked after, either because his own is being repaired, or a

guest's machine has to be housed, or for some other reason.

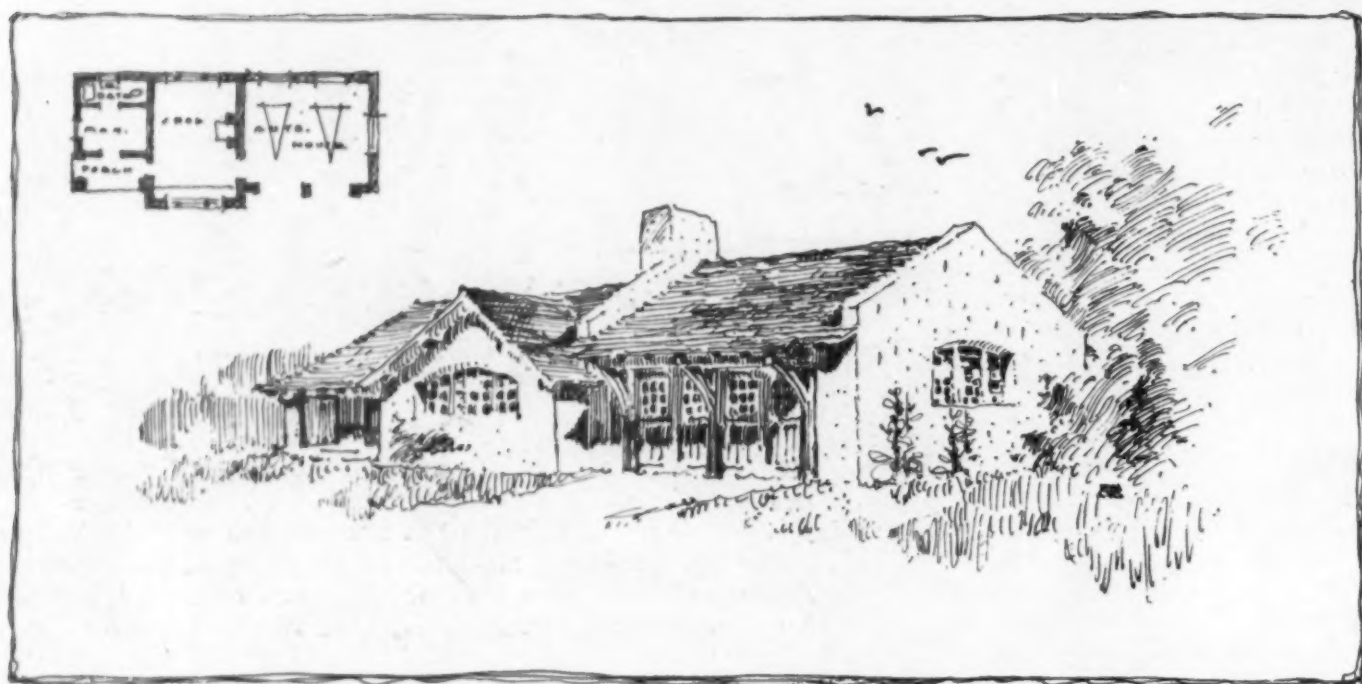
Probably the one important thing which will go further to make the building a success to the owner is the ease with which he can enter and leave it. For this reason it should be arranged so that the cars can stand along the back wall with the door opposite, and where the house is planned for two cars one door 9 feet 6 inches wide and 9 feet high is sufficient, provided there is room enough between the front and back walls for the car to make the small necessary curve in going out. This dimension from front to back should be at least 20 feet, which will allow a machine with perhaps a 90 inch wheel base to leave and enter easily. In case more than two cars are to be planned for there should be a door for each two cars, if possible. It is necessary, of course, in certain cases to use a different plan, but this one is without doubt the best, so far as ease in entering and leaving the house is concerned.

Another matter which should receive attention is that the house should be as fireproof as possible. In any building the floor should, if possible, be of cement, and if the building is to be of wood it should be mill framed as far as possible, that is, the frame should show from the inside instead of having the walls or ceilings sheathed or boarded on the inside. If the walls are sheathed, care should be taken to fill in between the studs with brick wherever a space might be left for the



SMALL GARAGE IN FRAMINGHAM, MASS.

House and Garden



SKETCH OF PRIVATE GARAGE AT COHASSET, MASSACHUSETTS

passage of fire. And of course there should be a faucet with hose connection, conveniently located with a hook for hanging hose at its side.

A fire in a house where two or more automobiles are stored would be so expensive, and so dangerous, that the greatest care should be taken to guard against it.

The ideal garage would be one built of masonry with concrete floors and brick or concrete walls, with perhaps a mill framed roof or second floor, if it were more than one storey high. The storage of gasoline too is important in this connection, and the safest way is to use gasoline tanks underground outside the house with a pipe leading to a small pump just inside, or better still, though less convenient, would be to have no connection between the tanks and the house, but to pump the supply outside into a can and then fill the machine from the can.

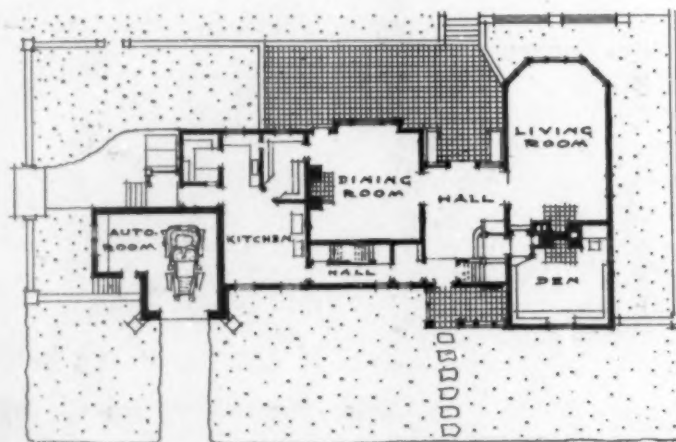
A washing-stand should be planned for in some convenient place in the building. This should be arranged the same as the carriage wash in a stable. In a larger garage, where a professional chauffeur is employed, there are many conveniences that may be added to make the building complete. In this type of building a small room should be fitted up as a workshop, with a strong work-bench with vise. This bench should be 4 feet wide and can be arranged with a wide shelf under which is a convenient place to store tires which are not in use. Also there should be a closet with poles and hooks and shelves or drawers for storing rugs or coats, and the many accessories that are necessary in motoring.

It is well too, to finish a room in the second storey for a chauffeur or perhaps two small rooms one of which could be used by a guest's chauffeur. And

there should also be a bath and toilet for their use, and there should be some arrangement too for hot water.

The plumbing and heating of a motor house need careful attention. There should be a sink either in the workroom or at the side of the wash-stand with hot and cold water and an overhead carriage washer should be placed over the wash-stand as in a stable.

The best method of heating the building is by either steam or hot water, and, of course, the heater should be put somewhere completely away from any room where gasoline is likely to be used. This is usually most conveniently located in a small room in the basement, and the heater may be arranged with a small separate coil, which will heat the water for the boiler which supplies the plumbing system. In the first auto houses a pit was usually made either in the workshop floor or in the floor of the



PLAN OF MR. ALLEN W. JACKSON, CAMBRIDGE, MASSACHUSETTS

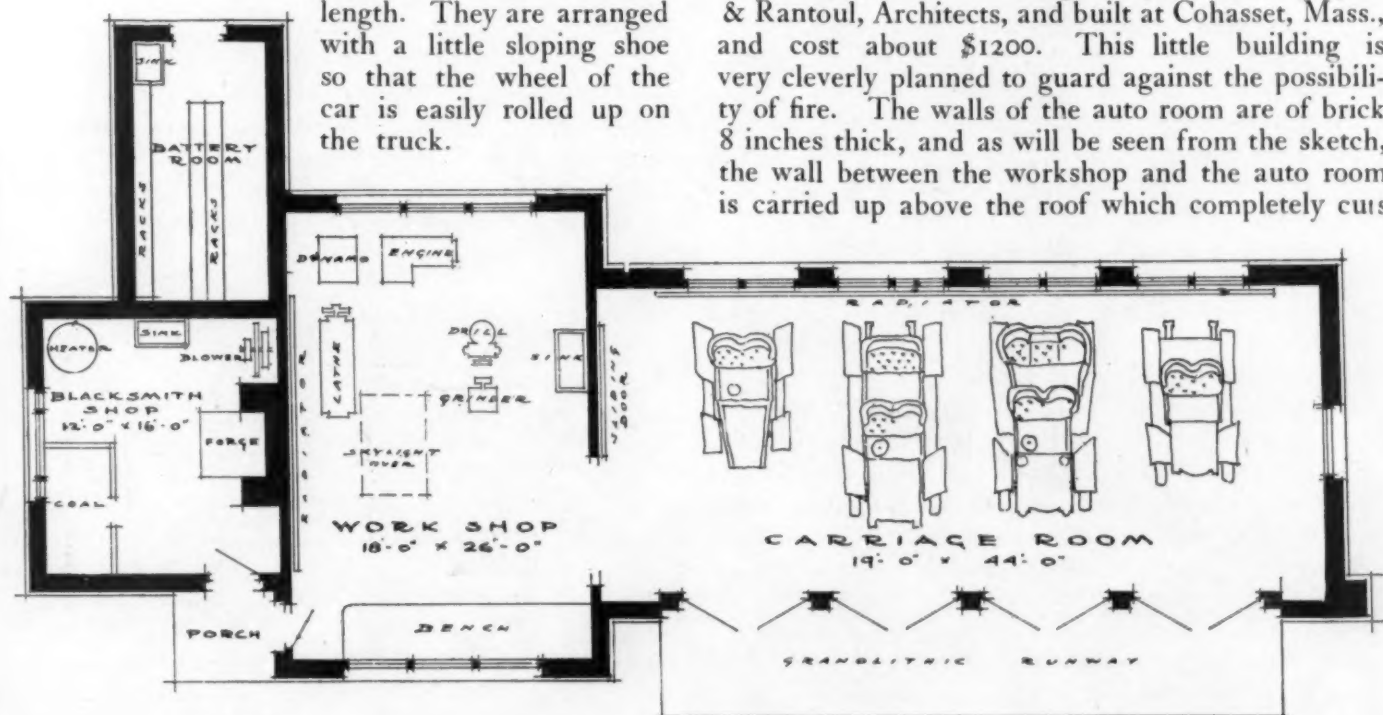
The Private Garage

motor room, over which a car could be run to be repaired. But now it is found to be much more convenient to arrange a chain tackle in the workroom by means of which the forward end of the car can be lifted to get at the under side when necessary. The pit was always an inconvenient place to work, and was usually cold and unsatisfactory, and it was almost impossible to get light enough under the car to see to work. The best arrangement for a tackle, is a triple chain tackler which is geared so that a man can easily lift the heaviest car.

It will be found convenient if the building has a second storey to have a big trap door over the motor room through which can be hoisted the tops of cars which are not in use.

In any building it is necessary to have as much light and air as possible, and especially in the workroom. The artificial lighting, of course, should all be by electricity on account of the danger from gasoline.

The most convenient arrangement for moving cars in a limited space is the small, low, four wheeled trucks, one of which is placed under each front wheel of the car and with this it is possible to turn a car around in its own length. They are arranged with a little sloping shoe so that the wheel of the car is easily rolled up on the truck.



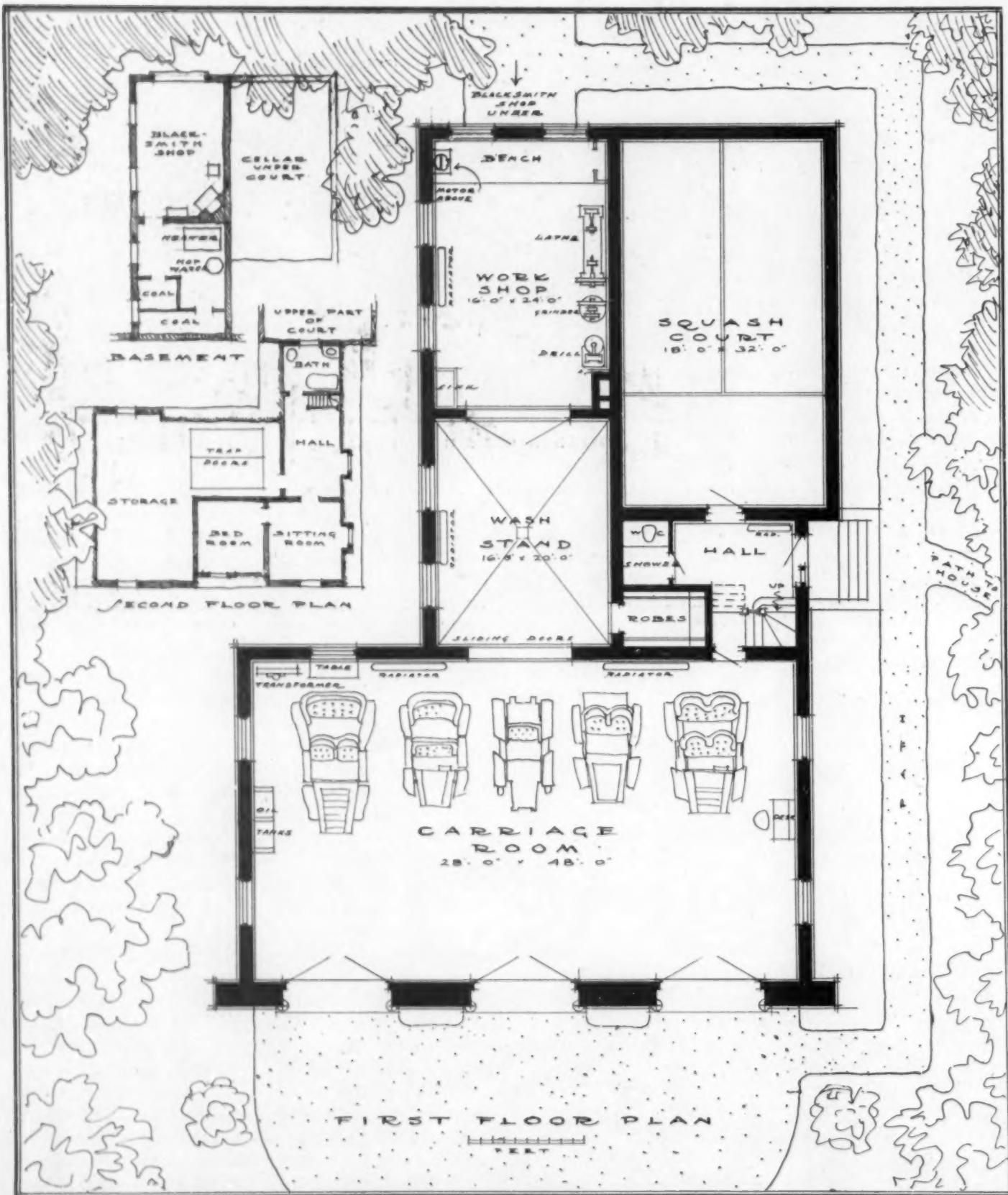
PLAN OF MR. DENEGRE'S GARAGE



MR. DENEGRE'S GARAGE, MANCHESTER, MASSACHUSETTS

A brief description of the houses shown in the illustrations will probably be of interest. The first one is a small house which was built in Framingham, Mass., which was designed by Charles M. Baker. It is a simple little building, but he has arranged the planting about it so attractively that its effect is most charming. It is built on piers, and has a wood floor and the framing and boarding of the walls and roof show from the inside. The exterior is shingled. The total cost complete was about \$250.

The second one was designed by Andrews, Jaques & Rantoul, Architects, and built at Cohasset, Mass., and cost about \$1200. This little building is very cleverly planned to guard against the possibility of fire. The walls of the auto room are of brick 8 inches thick, and as will be seen from the sketch, the wall between the workshop and the auto room is carried up above the roof which completely cuts



GARAGE OF MR. E. B. DANE, CHESTNUT HILL, MASSACHUSETTS

The Private Garage



FRONT VIEW OF MR. DANE'S GARAGE

off the motor room from the rest of the building. The floors of the workshop and auto room are of cement laid on a bed of broken stone with no basement under. The floors of the porch, man's room and bath are of wood and there is enough space under them to keep them warm in winter. The walls of the shop are of wood with the framing showing inside, and the walls of the man's room and bath are sheathed with hard pine sheathing, stained. All the rooms are finished up to the roof with the roof timbers showing. The whole exterior is plastered.

The third illustration shows a house which was designed by Allen W. Jackson for himself, and built in Cambridge, Mass. It was necessary in this case, on account of the size of the lot of land, to build a room for a motor car in connection with the house, and as will be seen* this was done at the service end of the house. This room is completely isolated from the rest of the house, being enclosed by brick walls and the ceiling and floor are fireproof, being built of Guastavino vaults. The room being shaped as it is, is admirably adapted to its use, as the alcove with its work-bench and

outside entrance is well fitted for a workshop, and there is sufficient room all around the car to get at it comfortably for cleaning it. The floor is of cement and pitched to a drain, under the car. This fireproof room probably added five or six hundred dollars to the cost of the house.

The fourth photograph with its plan shows a most interesting solution of the garage problem on a larger scale. It is one built at Manchester, Mass., for W. D. Denegre, Esq. and was designed by Andrews, Jaques & Rantoul at a cost of approximately \$5,000. As will be seen by the plan it was designed to accommodate four carriages, and is arranged so that each carriage stands opposite its own door which, of course, is the ideal arrangement where it is possible. It has the advantage also of economy in construction, as it enables the motor room to be made narrow from back to front, as no space need be given in front of the cars to allow for turning in going out. The workshop is located at the side of the cars and is amply lighted, having a window at both ends and a skylight overhead. The blacksmith shop, which is used both in connection with the garage and the farm buildings on the estate, is completely cut off from the rest of the building on account of danger from gasoline. In one corner of

*This interesting house was fully described and illustrated in the issue of *HOUSE AND GARDEN* for December, 1905.

House and Garden



CAR ROOM OF MR. DANE'S GARAGE

this room is the small steam heater, which heats the building in winter. At the rear of the blacksmith shop is the battery room. This room is filled with racks for storage batteries, which are charged from the dynamo which is located in a corner of the workshop. This dynamo is run by a small gasoline engine, and from these batteries the electricity is supplied for lighting the buildings and driveways of the estate. The batteries for the automobile are also charged from this dynamo. The floors are all concrete and are all pitched to drain so that the whole building may be washed out with hose and water. The floor of the carriage room is pitched to drains under each car and each car may be washed in its own position as room is allowed around each so that the others may not be wet. The walls are built of wood, plastered on the outside, and sheathed on the inside up to the roof. The roof timbers and boarding are exposed on the inside in all the rooms.

One of the most complete houses that has been built in this country, although perhaps not as large as some, is one that is shown in the fifth set of plans and photographs. It was built for Mr. E. B. Dane at Chestnut Hill, a suburb of Boston, and was designed by Andrews, Jaques & Rantoul, Architects.

As an actual working scheme this plan is about as well arranged as is possible. The carriage room is

liberal in size, which allows the cars to be moved to and from the wash-stand and workshop with ease without taking them out of doors. The wash-stand is located opposite the centre door and the car is run directly on to it on its return to the house. Then if a visit to the workshop happens to be necessary it is run straight into it, and can be taken back into the carriage room without the necessity of turning any corners, which are always difficult when a machine is not under power.

This building is situated at the edge of a slope of land which brings the back part of the building well out of ground, and allows for a blacksmith shop in the basement, which can be entered on a level grade from the stables which are in the rear of the garage. A plan of the basement is shown with the heater room, which contains a steam heater for heating the building in winter and a small hot water boiler for the plumbing.

The second storey has two rooms and a bath room for the chauffeur and also a large storage loft with a trap door from below.

In connection with this building is a squash court, the floor of which is a little above the basement level and is entered from a side door down the side of the hill. The court being 18 feet high extends through two storeys, and has a gallery a little above

The Private Garage

the levels of the first floor. There is also a shower bath and toilet room just outside the court with a closet for rackets, etc. under the robe room on the first floor. The floor of the carriage room is of granolithic, and laid on a bed of broken stone. The floors of the wash-stand and workshop are framed with steel beams with concrete construction and covered with granolithic floor. The walls of all the rooms, except the second storey, and the court, show the brick on the inside. The second floor is of mill framing of hard pine so the entire building is about as fireproof as it is possible to make it.

The workshop is a most interesting part of the building, and is fitted with the most modern machinery for this sort of work, and it is possible with this outfit, and the skill of the chauffeur, to make or repair any part of an automobile without the necessity of ever sending it away to have the work done. It contains a work-bench of liberal size, and the lathe, emery wheel and buffer, and the drill in the

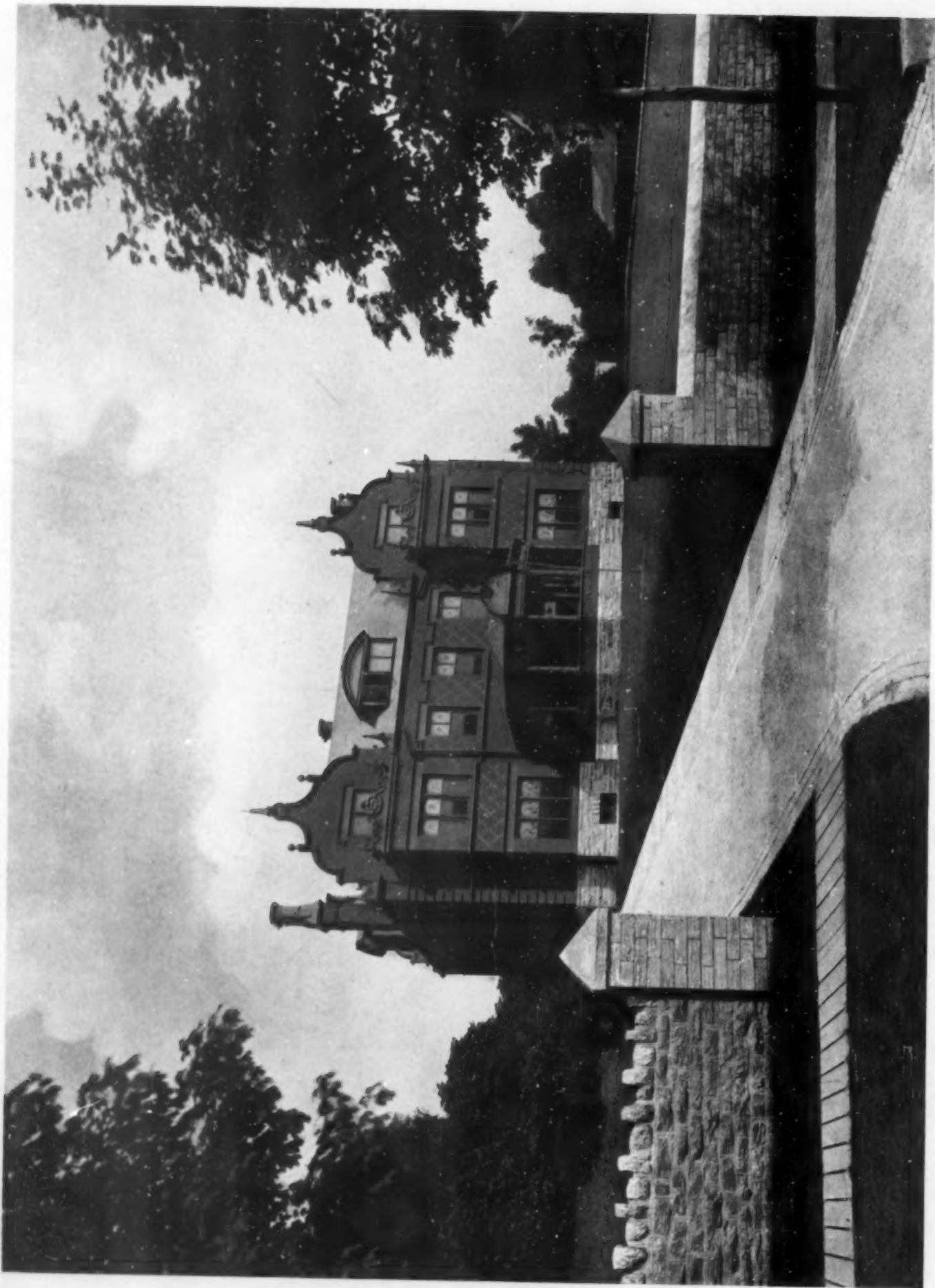
corner next the door are all run by a little two horse power electric motor, which stands on a shelf over one end of the bench.

The charging of the electric batteries which are used both in the electric and gasoline cars is done in the garage, by a transformer which changes the street current from an alternating one, which is the one used in Chestnut Hill, to the direct one necessary to charge the storage batteries. In this room are also the oil tanks, in which is stored the lubricating oil used on the cars and machinery.

The gasoline is stored in two one hundred gallon tanks, which are placed underground at the side of the drive, about 50 feet from the garage, and the gasoline is pumped into a can with a small hand pump. Two small tanks are used instead of one large one, so that the chauffeur may be warned when new gasoline is needed by the exhaustion of half of the quantity stored. The gasoline storage is the danger point in the building.



THE GARAGE FROM THE HOUSE



THE HOLTON HOUSE FROM UPSAL STREET

AN ELIZABETHAN HOUSE IN GERMANTOWN

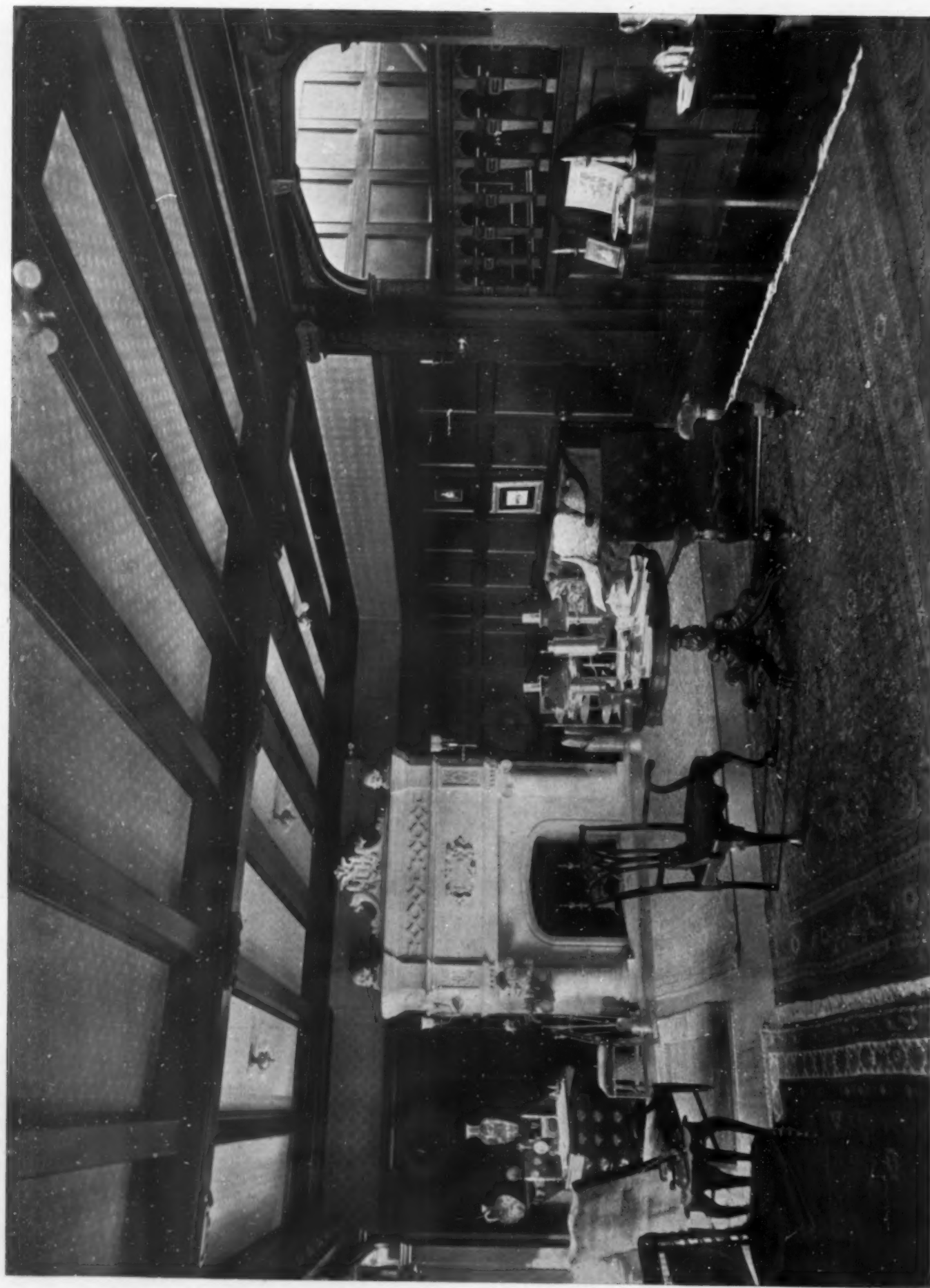
GEORGE T. PEARSON, Architect

THE accompanying pictures show the residence of Mr. S. Pearce Holton on Upsal Street, Germantown, Philadelphia, the site being raised considerably above the street level on one of the several knolls in that locality. It is the first instance of an Elizabethan treatment in Germantown, and is of a dark red brick with red stone doorway and dressings,

terra-cotta copings, etc. This type of house was selected because it was thought that it might prove a welcome innovation in the monotony of the Germantown gray stone houses abounding in the neighborhood, and also because of its ample field for interesting interior detail and rich coloring. This style has been consistently followed throughout.



PLAN OF FIRST STORY



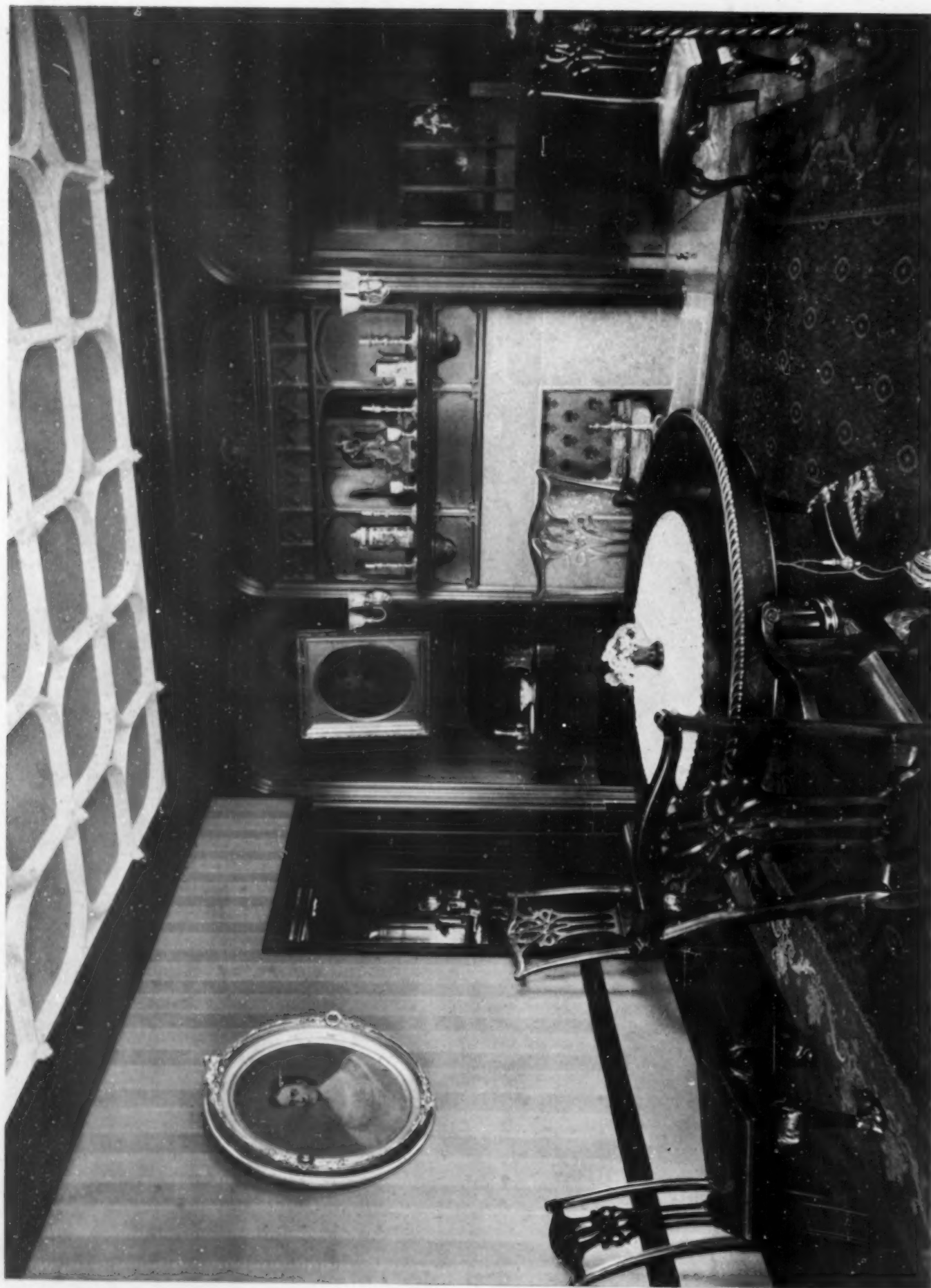
THE HOLTON HOUSE, GERMANTOWN—THE GREAT HALL.

Geo. T. Pearson, Architect



GEO. T. PEARSON, Architect

THE HOLTON HOUSE, GERMANTOWN—VIEW OF THE STAIRCASE



THE HOLTAN HOUSE, GERMANTOWN—THE DINING-ROOM

GEO. T. PEARSON, Architect



GEO. T. PEARSON, Architect

THE HOLTAN HOUSE, GERMANTOWN—THE LIVING-ROOM

THE BEAUTIFUL COSMOS

BY CLARENCE M. WEED



THE WHITE COSMOS

THE cosmos is one of the most satisfactory annuals for a border garden, both on account of the grace of its foliage and the beauty of its blossoms. It may be grown as easily as any of the garden vegetables and on account of the size and density of its foliage it may be used to great advantage along fences, walls and the sides of buildings. By choosing the tall varieties to plant next to the wall or fence and the dwarf varieties to plant in front one may get a most beautiful effect during the latter part

of the season, the flowers of the dwarf forms beginning practically at the ground and extending upward for many feet with a beautiful background of foliage for their display. Last October I saw some cosmos in Massachusetts bearing blossoms at a height of more than ten feet, producing one of the most striking effects I have ever seen in landscape gardening.

The seed of the cosmos may be started in a hot-bed, greenhouse or window-garden early in the season and transplanted out of doors when danger of frost is past. Or the seeds may be planted in a drill out-of-doors in May and the young seedlings transplanted, when they are an inch or two high, to the place where they are to grow. These seedlings are vigorous little plants with a compact root system, so that they are very easy to transplant. In a rich soil and with plenty of moisture they grow with great rapidity, sending up fine, fern-like foliage which gives an attractive effect long before the flowers appear. Even the buds have a decidedly decorative value, being rounded in general outline though flattened on the outer end and more or less enclosed by a double row of long, pointed, green, leaf-like growths called bracts.

When the flowers appear the plant becomes very conspicuous and attractive. Three sorts are commonly grown. In one the flowers are a beautiful glistening white, in another they are an exquisite pink color and in a third they are a deep red, the last named variety being the least attractive of the three.

The structure of the flower in each of these sorts of cosmos is similar. Around the base of the blossom there is a double row of long, pointed, deep green bracts, with a more definite lighter colored series above them. The chief attractiveness of the blossom is given by the petal-like ray florets, of which there are usually eight and which are sent



A JAPANESE FLOWER JAR WITH COSMOS

Planning the Garden

out in a plane at right angles to the axis of the flower. These petals are grooved in a most interesting fashion and are scalloped on the outer ends in a way that adds greatly to their decorative effect. In the petals of the pink variety, the color of which is really a light violet-red, there is at the base a spot of rose color which forms a delightful bit of what artists call a dominant harmony. The disc florets which form the eye of the flower have a general yellow color due to the yellow petals united into tiny tubes, and the yellow pollen which is pushed out through the stamen tubes, the latter being brownish black.

The cosmos has so great a spread of branches for the size of the stalk that they are most likely to remain erect when planted against the shelter of the wall or fence. This is also the place where their beauty is shown to best advantage. They may be made more stocky by pinching off the terminal buds, but this of course will lessen their height.

For use indoors, where they are extremely effective for ornament, these flowers require a spreading arrangement which shall simulate their manner of growth outside. Two or three sprays projecting from a slender vase and showing stems, leaves, buds and flowers are exceedingly effective, especially if placed against a plain background gray, or gray-green in tone. A larger display in a broader flower jar may also easily be made one of the most beautiful flower arrangements imaginable.



PINK COSMOS IN TOSA JAR

PLANNING THE GARDEN

BY IDA D. BENNETT

IT is generally conceded that "a thing well begun is half done," and certain it is that a well planned garden, where all the details have been carefully thought out, is practically a successful garden.

The first essential in planning a garden is to know just what one wants. This is not always as simple as it would seem, so many attractive features appeal to one in the floral world, while one's garden space is often so limited that choice must be more or less restricted.

Just at present the general trend of public taste seems to centre round the hardy gardens of our forefathers, and they have much to recommend them. The location of the hardy garden, however, should be quite distinct from that enjoyed by the garden devoted to bedding and ornamental plants, which preserve their attractiveness throughout the whole season.

These latter may be given a conspicuous position near the house where they will add to and constitute a part of the general scheme of development, while

the hardy garden should be relegated to the rear or side of the premises or even separated from the house grounds by a hedge of evergreens or blossoming shrubs.

A warm, sunny position, protected from cold rough winds by trees or shrubbery on the north and west, and sloping gradually toward the south, is preferable and a warm, sandy loam will give best results; this should be well enriched with old, well decayed manure, and dug deep and thoroughly.

The form and dimensions of the beds will depend upon the plants used, certain plants appearing to better advantage when grown in long rows, as the iris which gives beautiful results when grown in long rows—the longer the better. Foxgloves, on the other hand, while beautiful in long rows, are also fine in beds or clumps, and are very striking when growing on the edge of the water garden or pool.

Hydrangeas form beautiful hedges and are admirable for boundaries, they are also very fine when grown in large oval beds of a number of plants.

House and Garden

A good plan in arranging a garden is to have a large central bed, which may be either a water pool for lotus, a rockery or bed of flowers, or even a large circle of emerald turf, surrounding a sundial, or a garden table and seats, surmounted by an immense Japanese umbrella, and the beds and paths radiating from this. The beds, starting from this more or less restricted centre will be narrow at first but will gradually widen as they near the limits of the garden.

In planning a garden it should be borne in mind that the paths must be used for something more than to walk in. The wheelbarrow or hand cart must be a frequent visitor, at least during the fall and spring months when the care of the garden is much in evidence, and ample room for movement should be provided as nothing is more annoying than narrow paths to work in; narrow paths, too, are unsightly and give the garden a crowded, untidy effect.

The nature of the paths must depend largely upon the amount of expenditure one feels like making; dirt paths need constant weeding and are exceedingly unpleasant to work on, while gravel, so dear to the heart of the English gardener, makes work on them a penitential season, especially when performed on one's knees. A well drained cement walk is, perhaps, the ideal walk, but must be constructed with a keen eye to the drainage, that it may dry promptly after a rain and not hold water on its surface. For a cheap, comfortable walk, perhaps no better material can be found than common hard coal ashes, sifted and laid three or four inches deep and well rolled. If in addition to this it is given a foundation of a few inches of gravel, a smooth, elastic walk, which dries quickly after rain and costs practically nothing, is secured. Sod walks are beautiful, but impractical. They require an amount of care that is out of all proportion to the effect, the grass is constantly encroaching upon the beds and must be kept cut out with the spade, while it is difficult to run the lawn mower close enough to the edge to trim evenly without doing more or less injury to the beds, thus necessitating the use of the shears.

Then, too, the paths are always wet in the early morning and late afternoon and immediately after a rain—just those times when one most cares to work or stroll in the garden. The ideal path should dry quickly after rain, be elastic to the tread and smooth to kneel or work on.

In planning the hardy garden, those plants which give the longest season of bloom should be selected for the more conspicuous positions, which will be, usually, from the centre of the garden, especially if this centre is composed of a bit of lawn and seats. Many of the early blooming varieties of hardy shrubs and plants, while very beautiful in them-

selves, have so short a season of bloom that they should be massed well toward the back of the beds and the front of the beds filled with lower growing forms or annuals. There are many edging plants, both among the perennials and annuals that may be utilized here to good advantage, chief among these is the double English daisy, which is in bloom from the first vanishing of the snows until they come again. The schizanthus is another pretty border plant of the annual calendar, suitable for edging. The new varieties grow about a foot high and during their season of bloom are a solid mass of flowers; unfortunately they die quickly after blooming and must be removed. A very good edger for the hardy beds is found in the summer oxalis, which starts promptly from spring planted bulbs and blooms continuously all summer. There is, also, a dwarf zinnia that is very desirable here, being of an intense cardinal scarlet, about a foot in height and a most profuse bloomer all summer. The hypericum is a very desirable, low growing, perennial that may be planted in front of masses of taller plants and is very beautiful.

In arranging the garden some attention must be paid to the color scheme if an harmonious effect is to be realized. It should be remembered that while red and blue do not combine harmoniously, different shades of red, as magenta and scarlet, are scarcely more happy. On the other hand most shades of red, rose and pink are beautiful with lavender, and a liberal amount of white much increases the brilliancy of the other colors. Blues should, as far as practicable, be planted in the rear as it increases the apparent distance, thus increasing the (apparent) dimensions of the garden, while such colors as scarlet and yellow, when planted in the rear, by bringing the boundaries nearer decrease the apparent size of the garden.

If the garden space is limited to one garden and there is, consequently no separate rose garden, the front of the perennial beds affords a desirable place for the hybrid perpetuals, and teas, thus assuring a continuity of bloom throughout the season. Roses grown in connection with the hardy garden, however, must not be mixed with other plants but have a clear space to themselves and be kept free from weeds and well cultivated throughout the summer. These radiating beds, starting from a narrow point, and increasing in width towards the rear are very satisfactory for growing roses as the front rows cannot hide those in the rear, but allow all to be seen, while the hardy shrubbery in the rear forms a background, which shows off the roses to good advantage.

Another point that requires careful consideration in planning the garden, that is in deciding what plants shall be grown, is to guard against planting trouble in the form of plants that spread from the

The Hardy Garden

roots unduly or self sow to a troublesome extent. Among the first named may be cited the *Bocconia*, a noble growing plant some six or eight feet in height, with large, effective foliage of a light, glaucous green, lined with white and sprays of fine white flowers a foot or more in length. This plant runs under ground forming rhizomes from every joint of which a new plant starts, and it is for this reason extremely difficult to destroy once it has gained a foothold, as the smallest piece left in the ground, will grow and form a new plant. As, however, it is a very effective plant it should be grown with proper precautions, which consists of planting it in a strong frame, a box or hogshead, with the bottom removed. Thus grown it is powerless to cause trouble and forms a valuable addition to the hardy garden.

The *Bignonia radicans* is another plant requiring similar precautions and should never be allowed to form seed as the seedlings establish themselves so firmly before making themselves conspicuous that it is often difficult to dislodge them, and I am not certain that, planted where they can cause trouble, it would not be well to leave the bottoms in the boxes or barrels in which they are planted, so deeply do they sink their roots.

Poppies, petunias, foxgloves, sweet alyssum and the cleomes are among the plants which self sow freely and, with the exception of the foxglove, are apt to prove troublesome. When they come up in the paths they may be removed by scalding, salting or the application of sulphuric acid or milk, this latter being quite fatal to plant life.

THE HARDY GARDEN

BY ERNEST HEMMING

THERE is no class of plants so peculiarly adapted to awaken interest in all who live in the country to the delights of gardening as the hardy perennials. That they require neither greenhouse nor graduate horticulturist to grow them is testified by many a cottage garden with its wealth of glorious bloom.

The returning popularity of the old-fashioned hardy garden, has led to many attempts to reproduce some of the more notable ones of colonial times, as well as those that strike the travellers' fancy abroad. The latter does not often prove a success owing to the climate.

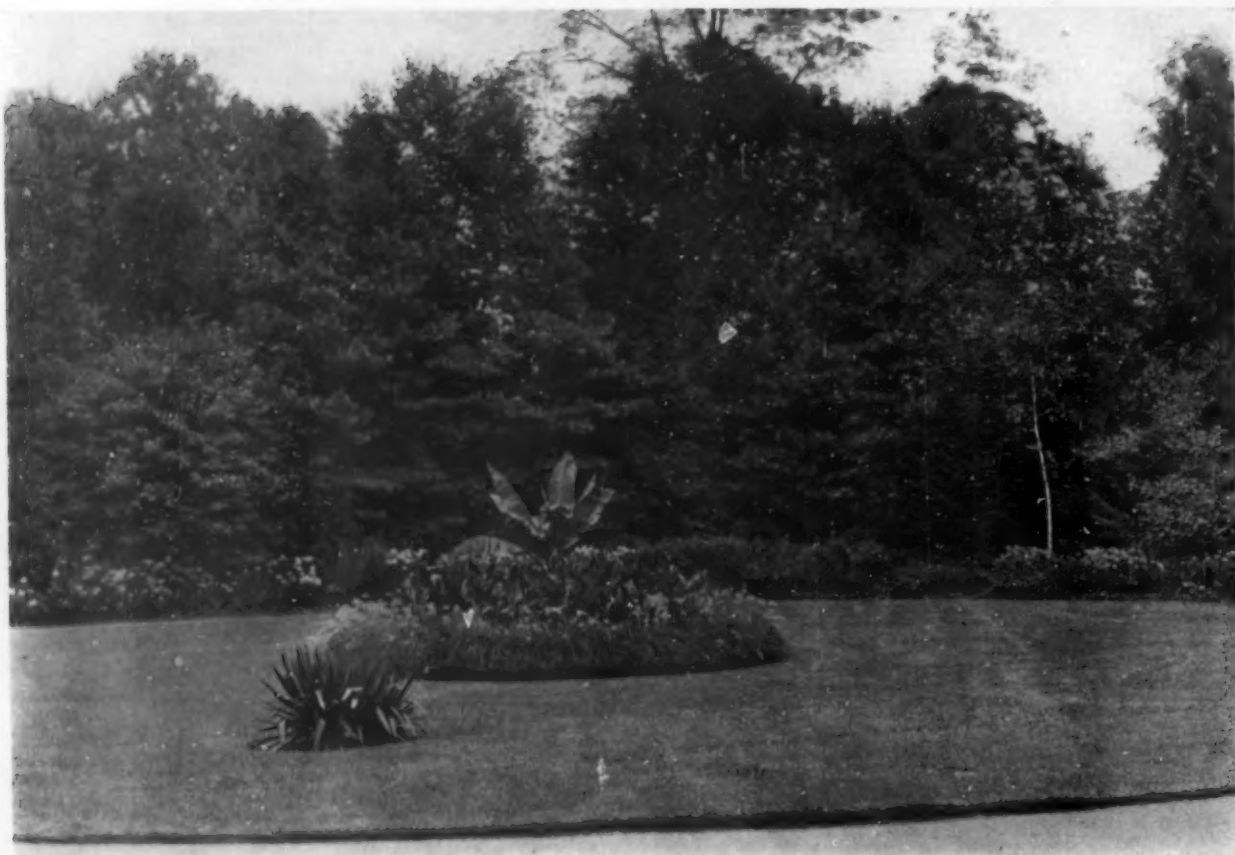
Like the architecture of the country, garden design in America seems to be a mixture of many styles, made imperative by our climate and surroundings. In one place we may see an Italian, in another an English garden and so on yet all have features that are more or less American. The actual reproduction is practically impossible under American skies, even were it desirable.

While design is an important factor in a garden, the well-being of the plants must always hold first place. A garden without any pretence of laying out, is a success if filled with thrifty plants, and a garden designed with the utmost care and ability is a failure if the plants that compose it do not look happy. The same is true of an individual plant or group of plants. However beautiful a bed of English primroses or wallflowers may be in an English garden, they would not be as satisfactory in an American garden as some plant more suited to the climate, so that the first consideration is to procure plants adapted to the locality and situation. The

second to place the plants where they will look the most natural.

There is no class of plants more adaptable or more interesting than the hardy perennials. Roughly speaking it includes all the plants that die down to the ground and shoot up from the roots the spring following or at their appointed season. Coming under this head are such well-known plants as the pæony, hollyhock, iris, phlox, columbine and a host of other well-known garden plants, but in addition to these are plants culled from every portion of the northern and southern temperate zones of the world, not forgetting the many beautiful natives of our woods and fields. With such a variety to choose from it would be strange if worthy plants could not be selected to suit every possible condition or location. All are more or less of an unconventional habit of growth. When a formal effect is required, very careful selection must be made, or when their surroundings are of an artificial character. In the accompanying illustration will be noted a well placed border of hardy perennials, such a border will always have some flowers in bloom which will help to relieve the sombre effect of the trees, and soften the line formed by the closely mown lawn and the natural planting.

The round bed in the foreground is more in keeping with the artificial conditions of the home and would look well without a natural background. It is planted with plants of a more tropical nature. The bold striking plant in the centre is *Musa Ensete* or Abyssinian banana, the surrounding plants being cannas and ornamental grasses. The plant standing alone to the front of the round bed is the



THE EFFECT OF A ROUND BED NEAR THE BORDER



HARDY PERENNIALS IN A ROCKY BORDER

The Hardy Garden



THE OLD-FASHIONED WAY BESIDE THE GARDEN PATH

yucca, a native of the South Western States, a plant that glories in the sunshine and perhaps looks best near rocks, or in a position in keeping with its native habitat, where luxurious foliage is not so often seen as arid wastes.

Our second illustration shows a better position for it. Several specimens may be seen growing among the rocks. Rockeries or rock gardens are more often a failure than otherwise, owing to the difficulty of placing them where they will have appropriate surroundings. If, however, they can be built where they do not look too artificial and where sufficient moisture is provided, there is nothing better for showing off some of the choicer alpines or mountain plants.

The pockets and crevices formed by the rocks are ideal places in which to grow such plants as edelweiss, mountain pinks, stonecrops, saxifrages, hardy cacti for sunny spots and choice hardy ferns, hepaticas, anemones and such like for the shaded ones. If the grounds around the home are of a rocky, uneven character, after the utilities have had due consideration, it is a great mistake not to take advantage of the great possibilities in this feature of gardening. One has only to see the wonderful effects produced by the Japanese to realize how much can be done with a few stones, and how much art is required to place a single stone in its proper position.

If a criticism of American design is at all justifiable it would certainly be of the tendency to make all gardens look alike, instead of originality and individuality.

Perhaps one of the most popular and from a utilitarian point of view, the best arrangement for growing a collection of hardy perennials, is the mixed border as shown in the illustration. In such a border flowers may be had for house decoration from early spring until late fall. Beginning with the snowdrop, daffodil and violet before the snow has scarcely left the ground, each kind blooms in its allotted season through the summer months until the Japanese anemone and the last lingering hardy chrysanthemum mark the close of the season.

A glance at the illustration will reveal a symmetry in arrangement which brings all the low growing ones to the front along the path and the taller to the back without apparent effort. The clumps of the individual kinds should be large enough to give character, and care must be used not to get clashing colors in too close proximity to each other.

Color effects are almost an impossibility where massing is required to produce them, success rather depends on the continuity of bloom, and to produce this a large assortment must be used, or there will be seasons when the border will not look very attractive.

House and Garden

Nearly all kinds of annuals can safely be planted among perennials without their looking out of place. They are excellent to fill in the bare spaces caused by the dying down of some of the early flowering perennials. There is a subtle fitness in the correct position of every plant. This is indicated to a certain extent by the habit or the associations clinging to it. A geranium looks out of place among hardy perennials, plants of a sub-tropical aspect do not

mix well with native plants. Sweet peas may often be seen growing on a lawn when they would look much better in closer proximity to the kitchen garden. Ferns seem out of place unless they are growing in a shady moist situation and so on indefinitely. The reason for the proper placing of all may not be quite so obvious as the ones mentioned but they exist nevertheless, and to produce the proper harmony in the garden they must be observed.

GARDEN NOTES

BY EBEN E. REXFORD

THE house that is bare of vines always suggests to me a woman without the decorative accessories of lace, or a bit of embroidery. There need not be much of either, for a little will relieve the plainness of any costume, but there ought to be a touch of one or the other to break up the monotony.

(This is a man's opinion, and some of the women who read it may take exception to it, but I shall hold to it all the same.) It is on this principle that I assert that a house without vines is lacking in one of the most important features of beauty.

One of our best hardy vines is the honeysuckle. That is, for covering porches and piazzas. As a vine to make itself useful above the first storey, it is not desirable. The illustration which accompanies this article shows a veranda enclosed with wire netting over which this vine has been trained in such a manner as to secure ample shade, and a generally pleasing effect. The opening shown in the picture is easily arranged for by leaving out a strip of netting, and running a piece across at the top for the vines to clamber over.

One of our best annual vines for use about verandas and porches is the Japan hop. This plant has pretty, dark-green foliage irregularly marked with creamy white. It is of rapid growth, and very graceful habit. It grows readily from seed which should not be planted until all danger of frost is over.

The good old morning-glory is, after all, one of our very best flowering vines for general use. It flourishes in any soil, will clamber to the second storey windows, if given stout strings to cling to, and will bloom most profusely throughout the season. To train over doorways and up about the kitchen windows, it is the best of all annuals because it makes dense shade, and will always go just where you want it to, if you furnish proper support for it. Binder-twine is excellent for this purpose, as it is stout enough to support the great weight of a luxuriant growth of vines, without danger of giv-

ing way after a shower—something which frequently happens when cotton twine and other small strings are depended on.

Our best all-around vine for permanent use is ampelopsis. It will grow anywhere at the North, is of rapid development, has beautiful foliage in summer, and is gorgeous in its fall coloring of scarlet and maroon. No flowering vine can rival it in brilliance at that season. It will go to the



A HONEYSUCKLE-COVERED PORCH

Garden Notes

chimney-tops, in time, and cover the roof, if you let it. There seems no limit to its possibilities in this direction.

Another excellent native vine is the clematis. It is beautiful when in full bloom, its delicate white flowers making its foliage look as if flecked with foam, when seen at a little distance. Later in the season, its silky-tailed seeds are as attractive as any flowers could be. The writer has a beautiful plant of it which was allowed to take possession of a lilac bush, as a support. It completely covered the bush, and was one of the most admired features of the home grounds, last season. In most localities of the middle West, this vine can be found growing in old fence corners, and the edges of woods, and it can easily be transplanted in the spring.

There is a variety of clematis of recent introduction, which deserves especial attention, because of its late flowering habit. It is in the height of its beauty in September and October after most vines have passed into "the sere-and-yellow-leaf" stage of their existence. Its foliage is a darker, richer, glossier green than that of the native clematis, and its flowers are larger and wider of petal, therefore much showier. They are borne in long sprays. A more graceful or beautiful vine it would be hard to imagine. It is of rampant habit, and, after the first season or two, will readily include the second storey of the house in its field of operations.

Too often we forget that the grounds about the house can be made vastly more attractive by the expenditure of a little time, labor and money. Or, if we do not forget the fact, we neglect to be governed by it, and the consequence is that the house-grounds are lacking in little beauty spots which might be constructed with very little trouble. Last season I was greatly pleased with a house of rustic construction, which a friend of mine had built at some distance from the dwelling, ostensibly as a store-house for garden tools, but really because he thought a structure of some kind would add attraction to that part of the grounds. And he was right about it. The building was made of posts set into the ground, boarded over, and finished with bark put on as



HOW THE VINES ADDED AN ELEMENT OF BEAUTY TO THE TOOL HOUSE

shown in the illustration, and a shingle roof. Over it was trained the Japan hop of which I have already spoken. This was made use of temporarily, because of its rapid growth, but an ampelopsis was set out with a view to its covering the structure permanently, after the first season. The house is a most attractive feature of the place. The children of the family petitioned the "powers that be" to turn it over to them as a play-house, and very likely it will be turned into that this season. But, as tool-house or play-house, it serves a purpose which I am glad to call attention to, and I trust the picture will so please some reader that he will undertake the construction of a similar building on his home grounds. A roofed, but uninclosed pavilion, with vines trained up its posts, makes a most delightful summer-house, and one in which the whole family will spend a good deal of its time during the hot season, if it is made large enough to accommodate a hammock and half a dozen chairs constructed on lines conducive to ease-taking and solid comfort. And the beauty of it is any man or boy, with ordinary ingenuity, and a little knowledge of the use of tools, can build such a house without the assistance of a professional, and, in the building of it,

House and Garden

get more pleasure than he could out of almost anything else he might undertake.

If there is a stream near the house, or anywhere on the grounds, the boys of the family will take delight in building a rustic bridge over it, if they get a little encouragement from the father. Such work not only amuses them, but it is one phase of a practical education. It teaches them how to use saw and hammer and square. And it makes them quick to see the beauties of outline, and the combination of grace and utility that can be worked out in even a little bridge over a brook. If there does not happen to be a brook to span, it is possible that there may be a ravine which can take the place of one, over which a bridge would be convenient, as well as attractive. I believe in educating the boys to an appreciation of the possibilities of home-beautifying, and in encouraging them to make the most of whatever qualifications they may have in this direction. Boys like to originate and they like to have credit given for all that deserves commendation. One of the most effective ways to make a boy take an interest in his home is by getting him to do something to make it pleasant. There is much about any place that boys can do, and will do, willingly, if they are given to understand that you would like to have them do it. This may be a digression from garden-talk, but, after all, *is it?* Aren't the boys growing plants in the home garden?

I hope that every owner of a home will set out at least one peony plant this spring, if there is none growing there. This because I consider the peony one of the very best of our hardy plants for the ornamentation of the home grounds. It is hardy, robust, wonderfully showy when in bloom, and increases in size and value indefinitely, if given proper care. And the care required is slight. It should be liberally manured each season, taking care not to disturb its roots in working the manure into the soil. If this is done, and grass is kept from growing close about it, your plant will soon develop into one of great size, from which scores of magnificent flowers can be expected annually, and these will increase in size and quantity as the plant grows older. The peony does best in a rather heavy soil. It strongly resents any interference with its roots. Disturb them this season and you will probably get no flowers from it next season. Therefore, if your friend who admires your peony begs for a bit of it, steel your heart against the promptings of friendship and say "No" to the request. And, having said it, stand by your decision, much as it "goes against the grain" to refuse. You can have fine peonies only by leaving their roots undisturbed. Keep that in mind, and when anyone asks for "just a little toe" of your plant, give, instead, the catalogue of some dealer who can furnish all the roots anyone is willing to pay for. Peonies are among our most

valuable flowers for cutting. Five or six expanded blossoms, a few buds just ready to open, and a quantity of its own foliage will make a magnificent decoration for the parlor.

Perennial phlox is another hardy plant that I cannot too strongly recommend to the attention of anyone who is planning to add to her list of border-plants this season. It will "take care of itself" better than any other plant I have any knowledge of. But because it *can* do this, it ought not to be obliged to, for it will do so much better with proper culture that it ought always to be well cultivated. In order to get the most out of it, it should be given a rich soil, and never be left to fight for possession of its quarters with weeds and grass. When neglected, it will seldom grow to a height of more than two feet, or two feet and a half, but the same plant hoed about and manured, will often attain a height of five feet, and send up scores of stout stalks, topped with enormous panicles of bloom. We have no other flower that gives such a solid mass of color.

To secure best results from it, it should be planted in groups. By using some of the tall growing varieties at the rear, then a variety of medium height, with dwarf sorts in the foreground, it is an easy matter to secure a great bank of bloom in scarlet, crimson, carmine, lilac, mauve, or white. Each color can be used separately with fine effect, or in combinations of harmonious colors. The white sorts relieve all other colors, and harmonize with them perfectly, but beware of putting the lilacs or mauves with the crimsons or carmines, if you do not care to have a color-discord that will positively make the eye ache. But these lilacs and mauves, when used with the white sorts, at some distance from their more brilliant-hued relatives, are so dainty in tone and tint that you will be delighted with them.

Right here, let me say that it is an excellent plan to divide old plants of this phlox, and, for that matter, nearly all border plants that have been neglected so long that they seem to need a renewal of vitality. Cut them apart and make new plants of the portions removed. Fill in about the part left with rich soil, and by midsummer your old plants will be as thrifty and luxuriant as when in their prime, and your new ones will be better in every way than the old ones would have been if given no attention.

Are you going to put out any shrubs this spring? If so, why not plant an English hawthorn? To my mind this is one of the most beautiful of all our shrubs, with its shining, dark foliage and clustering clusters of dainty white flowers. Its unopened buds are almost as beautiful as the expanded flowers.

Have you ever grown *Daphne Cneorum*? If not you have a treat in store for yourself. This evergreen shrub—better known in many localities as

Garden Notes

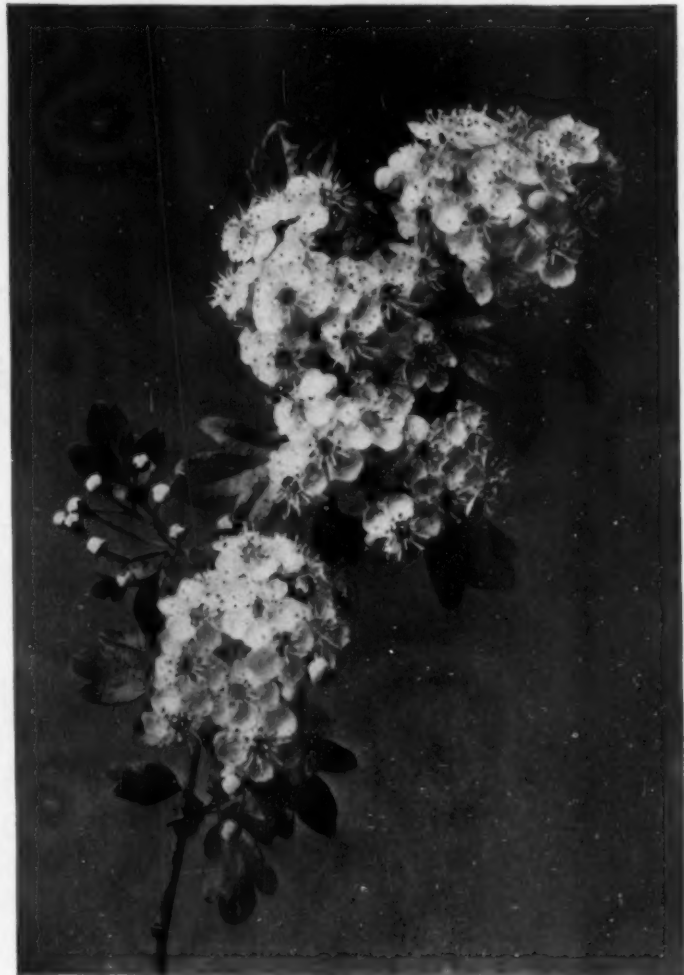
garland-flower, because of the wreath-like character of its branches—is of low, spreading habit. Early in spring, and at intervals thereafter throughout the season, it bears a profusion of soft pink flowers, as fragrant as they are beautiful. Because of its low growth it should be given a place near the path, or in the foreground of taller shrubs. If given a place where it can have an evergreen for a background, it will be more effective than when planted in an exposed position.

All shrubs ought to be carefully pruned each season. There will be weak branches that need removal. If thick, there should be a good deal of thinning out done, to admit of a free circulation of air, and give the inner branches an equal chance with those on the outside of the bush. If any branches have suffered in winter, they should either be wholly cut away, or cut back to sound healthy wood. If there is lack of symmetrical development, shear away the too rank growth until the plant is brought into proper shape. But beware of going to the extreme of shaping it into a formality and primness which will be quite as bad as the plant's own mistake in developing branches where none were needed, or of making luxuriant growth, in places, at the expense of other branches.

But, know your shrub before you prune it. By that I mean this: Be sure not to cut back, at this season, such plants as the lilac, whose buds were formed last fall, for, if you do so, you destroy the crop of bloom in proportion to the thoroughness of your pruning. Let such plants bloom and *then* prune them. Spring pruning is for shrubs which make some growth of branch before they bloom, like the rose.

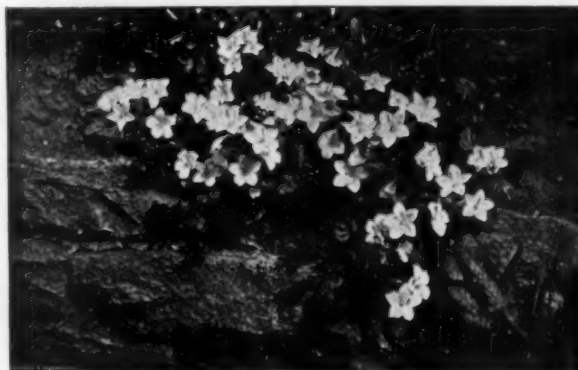
All shrubs ought to have the grass hoed away from them early in the spring, and a liberal amount of fine manure worked in about their roots. Barnyard manure is best of all, if you can get it, but if it is not obtainable, commercial fertilizers can be used with good result. To keep a shrub in good condition for a term of years, it must be fed well each season.

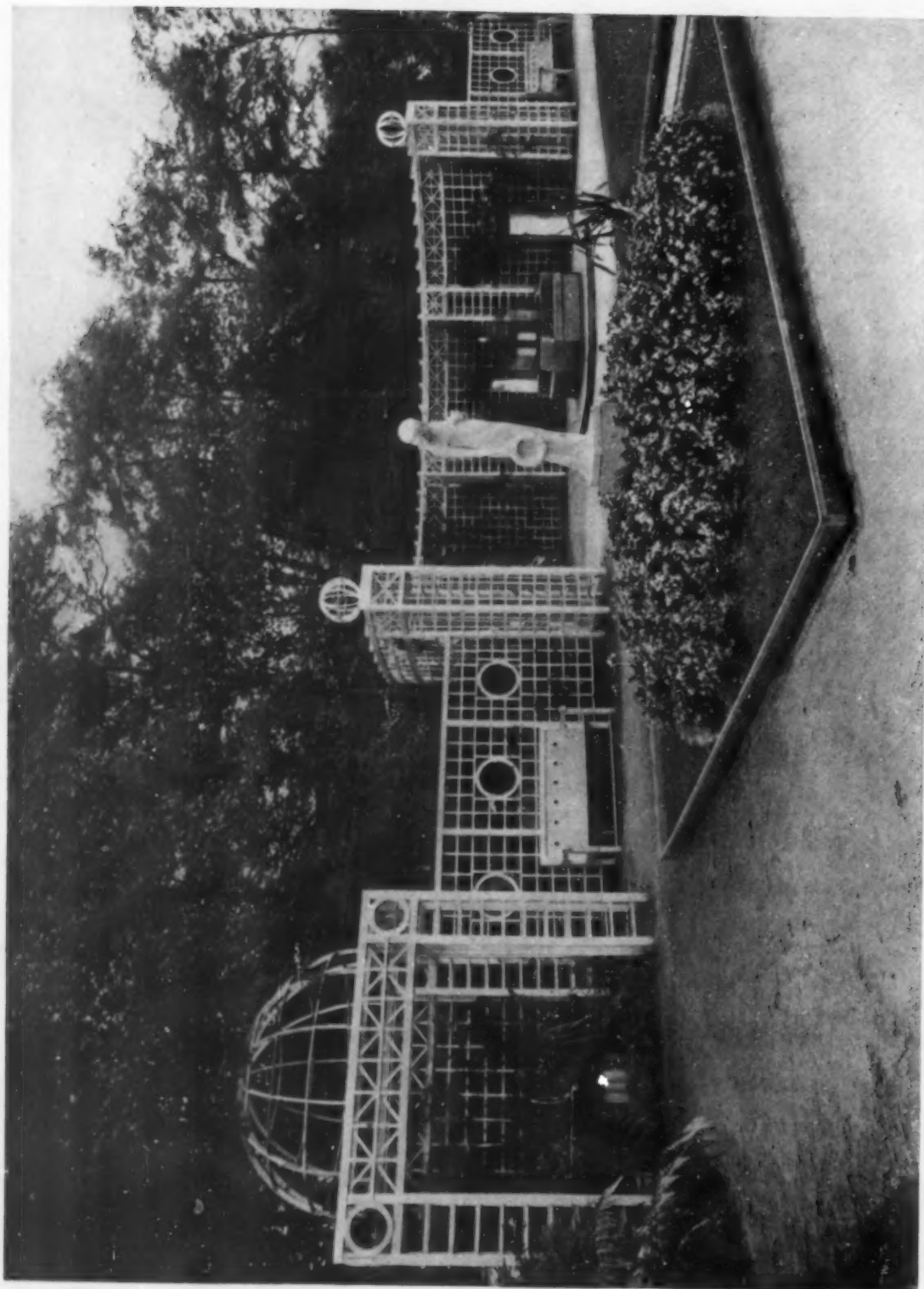
A lady asks what I use to keep insects from destroy-



ENGLISH HAWTHORN IN FULL BLOOM

ing roses. My standby in the insecticide line is the ordinary Ivory soap of household use, half a cake melted and added to a pailful of water. Apply the infusion with a garden sprayer, being careful to get it to the underside of the leaves. I do not wait for the insects to come, but take it for granted they are coming, and treat my plants as if they were already there. In this way I prevent their gaining a foothold on my plants. It is the "ounce of prevention" that is "worth a pound of cure."





A BACKGROUND OF WHITE TRELLISWORK OF WOOD

THE GARDEN AND ITS FURNITURE

BY GILLIAM FIELD

MUCH more goes to the making of a true garden than flowers, shrubs and pathways. Such a garden, set down in the midst of the fields, would appear desolate and incomplete, lacking boundary walls and trellises, fountains and shelters, seats for rest and contemplation, and even tables for our attendant creature comforts. Especially is this true of the domestic garden, the *jardin intime*, the garden which lies next the house and forms a part of it, an outdoor living-room for fair weather and reflective moods. In the stately gardens of the Italian Renaissance, as d'Este for fine example, in the charming domestic garden of the peristyle of the Vettii at Pompeii; in the fair Egyptian garden so quaintly pictured upon the tomb walls at Thebes, all these accessories give vitality and accent to the more natural components of the scene; and their use in all ages of garden design shows the fundamental quality of their aid as giving definiteness and completeness to the scheme.

For these accessories all materials have been employed, according to the importance of the composition or the fancy of the designer: marble, stone, brickwork, stucco, ironwork, or wood. Marble for the stately formal garden; brickwork or stucco for the more homely though not less dignified design;

metal work rarely, and to be used with best judgment under penalty of dire failure; but woodwork for the garden wholly of domestic and familiar aspect, though a material not incapable of maintaining itself with dignity in even larger or more strictly formal compositions.

Woodwork painted white is the basis of the treatment shown in these charming examples, for which we are indebted to recent issues of *Dekorative Kunst*—examples having that air of freshness of conception so characteristic of the better phases of modern German design, decorative or other. Here is the shelter for a decorative fountain which, supporting the green shade of a vine punctuated with accents of purple flower, would add immensely to the charm of the effect of the sculptural element of the composition.

As a scenic background for a large public garden, the illustration shown on page 182 is de-

cidedly effective. This was designed for use in connection with the Northwestern Germany Exhibition held in Oldenburg in 1905.

The quasi-temporary character of the enterprise justified the use of the white woodwork and the form of trellises and shelters on so large a scale and these showed with excellent effect against the dark background of the woods behind. The design and con-



A SHELTER FOR THE SUSANNA FOUNTAIN

House and Garden



SOME NOVEL PIECES SHOWN AT A RECENT EXHIBITION

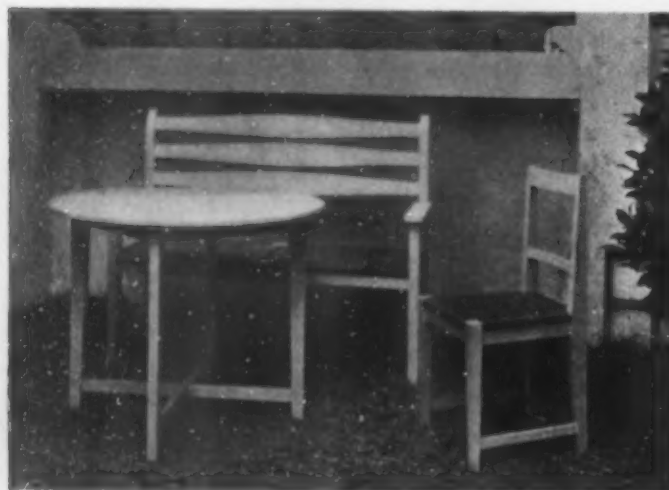
struction of these garden adjuncts is of the simplest character, and it is indeed the essential simplicity and restraint of the design which makes them so effective where a pretentiousness born of complex lines, less rigid and restrained in their combinations would have made such a use of woodwork inadmissible.

In the examples of minor garden furniture, illustrated on pages 184 and 185, this same simplicity

of outline and careful adaptation of the material to its uses, having due regard also to exposure to the weather, results in that air of appropriateness which is so characteristic of these pieces.

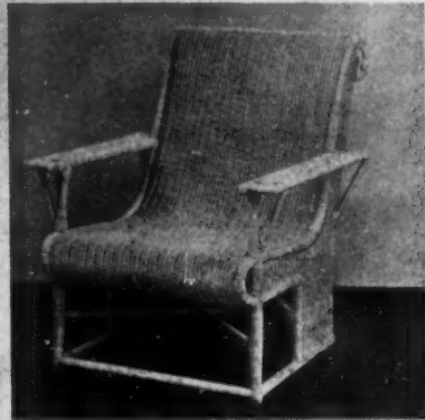
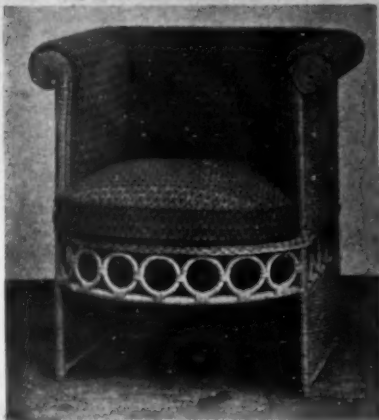
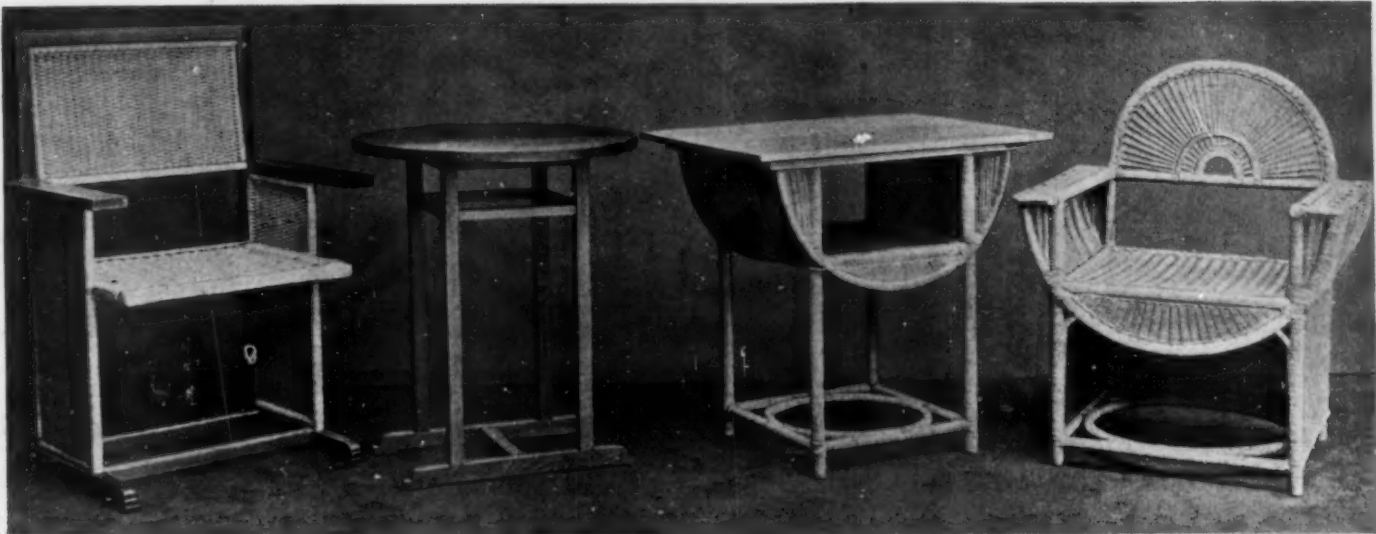
In the example of the "red garden" of the Darmstadt Garden Exhibition of 1905, shown on page 186, we see a quaint and somewhat Japanesque effect produced by the same means.

Garden development in our country is in so early a stage, as yet, especially as regards the smaller private garden, that we seldom make real use of our opportunities, even if we pay attention to the garden at all. Usually, in our smaller gardens, we are content to lay them out and plant them on a modest scale, but merely as something to be looked at from the house windows—our own, or our neighbor's—rather than used. This is due to two causes. First because we are apt to run away from home in summer, when the garden is most usable; and, secondly because we do not understand how to go about the use. Even on city lots, our tea tables and easy chairs in the garden may be skilfully and completely screened from the curious eyes of our neighbors, without burying them too deeply in their sheltered retreats, whether of pergola, tea-house or arbor. In rural or suburban gardens the problem of course is more easily solved.



A SIMPLE GROUP

The Garden and its Furniture



EXAMPLES OF WICKERWORK FURNITURE

The value of out-of-door life both for the well and the ill is being insistently preached to-day by the medical profession and the garden is one of the means ready to hand for its accomplishment. Half the time spent indoors during six or seven months of the year might be more profitably spent in the garden—which should be regarded primarily as an out-door family living-room, and freely so used.

We have rather lost the art, indeed, of so using the garden, for in our great grandmother's time the old English idea of its relation to the house had

by no means died out. It did finally lose its force and then our gardens were neglected and forgotten. Within a decade the revival has taken place, but almost wholly to meet

the demands of the owners of the great houses now building, for display without as well as within. It is quite certain that in many such cases there is no real sense of enjoyment of the garden for itself, but only for what the garden visibly stands for—the affluence of the owner.

It is then, in connection with the more modest, and perhaps more real, home, that the garden stands in need of recognition and sympathy, which will be

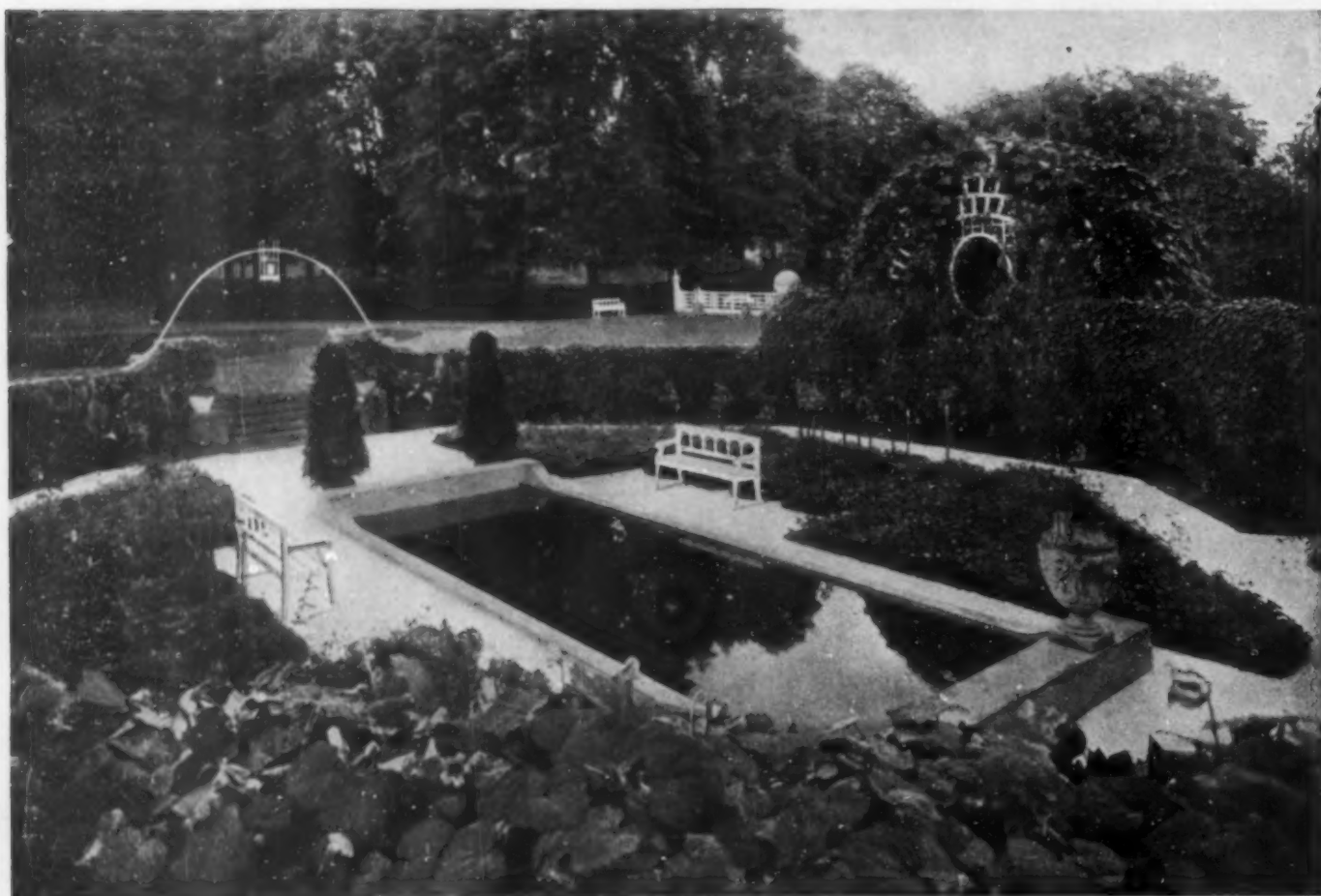


A GARDEN TABLE



THE USE OF BLACK IRONWORK

House and Garden



THE RED GARDEN

well repaid by the pleasure which comes from such sympathetic use. And for this use, such adjuncts as are pictured here, or others of their kind, are indispensable. As well a room without its furniture as a garden without its seats, tables, chairs, benches, tea-rooms, pergolas, arbors, sun-dial, walls, terraces and steps up and down.

A recent writer has defined gardening as "the art of peace and luxury," but this does injustice. An art of peace of course, but by no means necessarily of luxury unless one be thinking only of the stately garden of the Italian and French Renaissance. Gardening, though not, perhaps, primarily a domestic art—since the garden in some form is, or should be, considered an indispensable setting of every building; a link between art and nature—ought to be regarded by the householder of even the most moderate income as an opportunity for adding to the charm of home life by simple and inexpensive means.

On this point we cannot do better than quote the following passage from Mr. Clipston Sturgis' paper on the English Garden:†

"The whole attitude of mind of the Englishman

is the desire to satisfy a need rather than to supply a luxury, and therefore this is generally found to be the chief motive in the laying out of his garden. The great majority of English gardens have developed in direct response to practical needs, and if one studies these needs and sees how they have been met, the history of nine-tenths of the English gardens is given.

"Before taking up in detail the needs which decide the character of the grounds more removed from the house, it will be well to point out that the English invariably carry into their grounds the same desire for privacy and separation which is noticeable in the house. The careful separation of the kitchen and offices from the master's quarters has already been remarked, and a similar separation is to be found between other parts of the household and between individual rooms. The nurseries are apart; the master's own rooms are apart; the guest-rooms are apart; and finally, except in suites of rooms used only for entertainment, the individual rooms are well divided from each other. This same principle underlies the garden plan. The place is considered as an outdoor house. The grounds are divided up according to their use, and each portion has its well established boundaries."

†In "European and Japanese Gardens," Philadelphia. Henry T. Coates & Co., 1902.

THE DISPOSAL OF WASTES FROM COUNTRY HOUSES

By ALBERT PRIESTMAN

SEWAGE treatment is a subject of which the exigencies of mankind demand that everyone should have at least some general knowledge. The days are far past when the health of communities was regulated by the imperfect knowledge of hygiene, possessed almost exclusively by the medical profession. Steam and electricity have wrought wonderful changes. These mediums by which force has been harnessed for the service of us all, have so changed the habits of our lives, that it has been imperative that each generation should take a more active part than its predecessor, in studying the conditions governing a healthy existence, amid the ever increasing populations inhabiting our cities and suburbs.

We may shudder at the remembrance of the unsanitary domestic arrangements of our forefathers, and of the regrettably high rate of mortality consequent upon the proximity of the pump to the kitchen and outhouses, but at least we must admit that it was seldom that village streams were not a pleasure to look upon, with their waters inhabited by fish, and their banks healthful places for a quiet hour. In this past fifty years of strenuous effort after wealth, and in the rush for place and power, it would appear as though we had become careless of the license taken by manufacturers, by our neighbors and by ourselves, to pollute rivers, streams and ground waters with the offscourings of streets, factories, and dwellings. Seemingly the larger por-

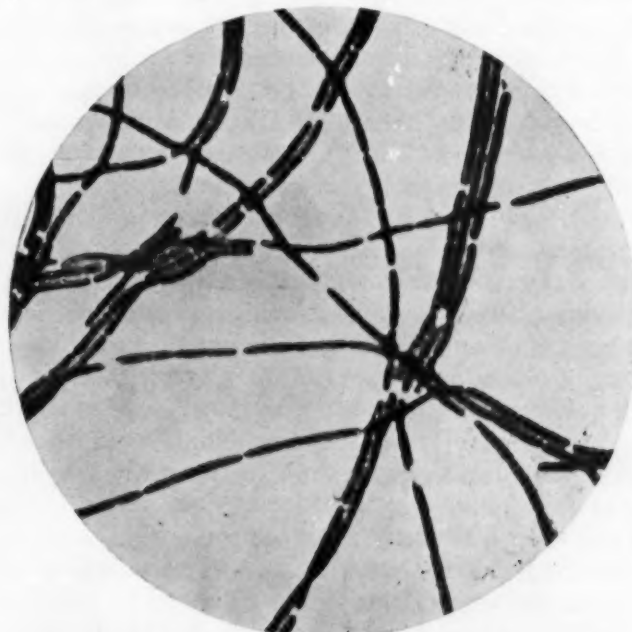
tion of our population is content in the erroneous belief that such pollution is unavoidable; that small watercourses in thickly populated districts must of necessity never again be expected to be inodorous and that if once then always, must fresh water fish give place to sewage. It is fortunate that although late in the day, a reaction is setting in, that our schools, colleges, and technical institutions are imparting the knowledge of a better way, and that the young voter is now ready to support at the polls, the enactment of laws, which shall call a halt to this hitherto deplorable condition of affairs.

We must not overlook the fact that every one of us is more or less to blame for what is wrong in regard to this important matter of sewage disposal. On the other hand it is much more a case of ignorance than anything else, which has held in check the advancement in the practical application of the knowledge, which fortunately has been greatly increased of recent years in this branch of sanitary science. It is our purpose, therefore, to speak of some of the truths underlying this subject, which have now been well established, and which, as they become better known, cannot fail to bring about a more united effort in abolishing abuses, which today, alas, are a scandal to our boasted civilization.

In another issue we shall give particulars with illustrations of sewage disposal works for residential service, constructed upon strictly bacterial lines, and explain the reasons for the various parts, by the com-



AEROBIC BACTERIA WHICH BREATHE AIR AND CHANGE ANIMAL AND VEGETABLE INTO MINERAL MATTER



SAPROPHITIC BACTERIA. CONSUMES DEAD ORGANIC MATTER



PARASITIC BACTERIA WHICH ATTACK LIVING TISSUES

bined use of which satisfactory results are obtained. Inasmuch, however, as all methods of sewage treatment depend upon, or are preliminary to, bacterial action, it is of interest to consider first the natural laws governing these life processes, without which all efforts at sewage purification would be futile.

Let it be clearly understood that to change organic matter into harmless compounds, it must be burned. Therefore, to burn by fire or oxidation, is the only practical way of destroying filth. A simple example is afforded by impurities in our blood, which in the presence of air are oxidized or burned up in the lungs, from which we exhale, in the form of carbonic acid gas, the products of combustion. Kitchen refuse in cities is burned at garbage works, and in the country districts much is destroyed by being fed to pigs and poultry, while the remainder is turned into manure and feeds the land, the top soil of which contains countless millions of lower organisms.

It is all changed by fast or slow oxidation. The same law applies to the excretions of men and animals. These always contain aerobic or oxidizing bacteria, as well as those organisms which prepare sewage for being oxidized. It is not uncommon for a single gallon of sewage water, of which 1-1000th part only is polluting matter, to contain 24,802,000,000 of these little scavengers. This is approximately the number per gallon in the sewage of the city of London.

Here then indeed, is a force provided by nature, of immeasurable service. Were it to cease, all forms of life would quickly become extinct. The number of the known varieties of health preserving bacteria is upward of four hundred, or ten times that of the pathogenic or disease producing species, which mi-

nority is fortunately to a greater or lesser degree "crowded out" of existence by the vastly superior numbers of health protecting antagonists. The relative numbers of these two classes of bacteria have frequently been compared to the proportion that law abiding citizens bear to criminals in a community. The laws which govern the action of bacteria are not as dissimilar from those under which mankind exists as might be supposed. To the greater majority, air, moisture and food are requisites. Many varieties of these minute agents may be cultivated for the special purpose of sewage purification. That is to say, suitable environment and control will assist their life purposes. What are these life purposes? A generation has not passed since it was believed that sewage purified in soil, underwent changes, due entirely to chemical action. Now it is well established that these changes are the result of bacteria, a low form of vegetable life. The majority of those indigenous to sewage, belong to that class which are most active in the presence of air, and are known as "aerobes," the minority are known as "anaerobes," living without air. Of this latter class, a small number are "obligate anaerobes," which not only do not require oxygen, but may actually be inhibited or even killed by its presence, but the greater number are "facultative anaerobes," and can live either with or without oxygen. This is fortunate, seeing that sewage water may at one time contain little or no oxygen, while at another may be well oxygenated. The products also of bacteria, known as "enzymes," not only possess immense power in breaking up organic compounds, but enable a bacillus to act at a considerable distance, as well as in its immediate neighborhood.

These then, are the agents with which we must live in friendly relationship, if our highly civilized communities are not to be decimated by disease. It cannot be expected that the neglect of an army of such useful bacteria can take place with impunity. Food must not be lacking, and for the greater number of varieties, air is equally necessary. Although differences of opinion exist, it seems to be generally conceded that preliminary to the process of oxidizing sewage, it is wise to collect and retain it, not in ordinary cesspools, which are a menace to health, but in correctly designed and properly managed water tight reservoirs, known as "septic" or "resolution" tanks, because, (1) they avoid the deposit of solid matters at the entrance to passages leading downwards from the surface of the ground or other filtering material in which the sewage is purified; for, although in volume this solid matter is less than 1-1000th part that of the sewage water, it is sufficient to quickly interfere with the all important aeration of the interstices or spaces, in which the presence of air is a *sine qua non*, and which otherwise can only be insured by continual manual labor in raking the

The Disposal of Wastes from Country Houses

surfaces of the filter beds. (2) The use of tanks conveniently hides from sight the few floating objects, such as pieces of orange peel, which are not broken up in passage through the sewers, and which may offend the eye. (3) That, as the constituency of sewage is of the most variable character, containing acids and alkalis, it is beneficial, especially in cases where factory wastes are permitted to enter the sewers, that provision should be made for the blending of these varying mixtures. (4) Because the anaerobic action, which takes place in tanks correctly designed and operated, has been found not only to liquefy and gasify much of the solids in sewage, but also so to separate the particles and bring about other changes, as enables many times the volume to be treated on a given area, than would otherwise be practicable.

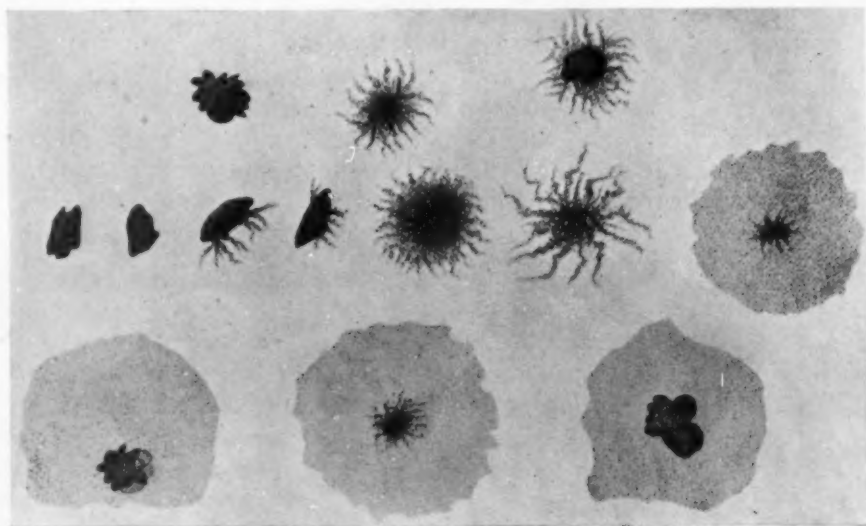
The capacity of these tanks should not permit of a storage of more than a single day's supply, (some authorities favoring as little as eight hours' detention), and its passage arranged so that the entire contents (with the exception of the small percentage of matters in suspension), will be expelled by the following day's inflow. If this is not accomplished, the poisonous excretions of the bacteria themselves will cause the sewage to come to an unhealthy condition, and instead of aiding in the work of purification, will defeat it. In the most successful examples, less than 10% of the suspended solids passes from these tanks, hence, 90% is kept from interfering with the subsequent treatment of the invisible organic matters which are in solution, and which, be it remembered, form 3-4ths of the polluting matters in sewage waters. Complying with the conditions governing the mineralization of animal and vegetable matter in liquid form is the most important requirement in sewage purification, but the 1-4th of solids in suspension, when not satisfactorily handled, is

the most troublesome part of sewage treatment. More is yet to be learned in regard to this matter from the experience of those who have designed and installed the most recent sewage works, but sufficient is known to enable a clear distinction to be drawn between resolution tanks and filter beds, constructed consistent with a previous knowledge of the governing conditions, and those which have been designed in a haphazard fashion, of which unfortunately there are too many examples.

In relation to the second stage of sewage purification, if the volumes of sewage are not divided by natural or mechanical means, so as to avoid suffocating the very bacteria which for their life purposes require abundance of air, it is only to be expected that disappointment will be met with. There are five methods by which sewage oxidation may be successfully accomplished. It is seldom, however, that local conditions do not point the experienced expert to the adoption of one, or it may be a combination of two or more of these methods. In referring briefly to these, we would ask the reader to bear in mind that the object in each case is that of providing sewage as food for bacteria which require air also, and yet are so minute that 500,000 may easily inhabit a single drop of liquid.

Land Treatment.—This may be by broad irrigation, as in the case of sewage farms, where crops are raised and cattle fed, but which are operated with the primary object of disposing of sewage. In case of single residences, surface or subsurface irrigation is employed, in which sewage is flushed intermittently over a sloping surface of ground, or into "fields" of open jointed drain pipes sunk beneath the surface. In the use of these processes it is intended that the sewage shall be absorbed by the soil, and destroyed by the bacteria inhabiting it. The character of the ground, its location, area available, the volume of sewage to be handled, the manual attention necessary, are a few of the governing factors in the selection or rejection of this method.

Intermittent Subsidence Through Sand.—Provided that the grains of sand are of the right size, and that sewage is fed in intermittent doses of suitable volume, the liquid will be prevented from passing downwards too rapidly, and will be intermixed with sufficient air found in the voids in the sand to effect bacterial oxidation. This is a method than which there is no better, where all conditions are favorable, and by which upwards of ten times the volume treated by the last named method may be satisfactorily purified, and at a less cost for manual



ANAEROBIC BACTERIA WHICH LIQUEFY SOLIDS IN THE
ABSENCE OF AIR

House and Garden

attention if the doses are flushed automatically.

High Rate Streaming Filters.—These are coming into favorable notice. The Friern Barnet type, where sewage is intermittently spread over and percolates through sandy soil, thoroughly mixed with comparatively large and porous material, has proved to give excellent results. Great care must however be exercised in keeping a six inch top coating of sandy soil in proper condition, by raking, etc. to insure satisfactory results. This type has been little used in this country as yet, owing to the fact that in New England, (whose inhabitants have been the pioneers in sewage purification), suitable sand, can usually be found and made use of in its natural position.

Contact Beds.—These are water-tight reservoirs, 66% of the holding capacity of which is occupied by broken stone, coke, or other material of comparatively large size. The outlets from these beds are closed while the sewage is fed to them. The liquid, if well distributed over the top, passes downward over the surfaces of the material inhabited by bacteria. Collecting in the bed it "rests in contact" so as to permit of the polluting matters both in solution as well as those in suspension, gravitating to the pieces of broken stone or other material, and adhering to them by "mass action." When the outlet is opened, the sewage water passes out of the contact bed, leaving behind it impurities to be consumed and mineralized by countless millions of bacteria, which are active during the hours in which the bed "rests empty" and aerates. The size of the material used allows of the passages between the pieces being sufficient to insure the subsequent drainage away of the mineralized particles. This is one of the varieties of what are termed "high rate methods," for it is capable of producing a nonputrescible effluent on 1-50th the area requisite in land treatment, for dealing with an equal volume of sewage. The certainty, where reliable devices are employed, for automatically opening and closing the inlets and outlets to these beds, that sewage will be equally distributed throughout the whole bulk of the material, without danger of channels gradually forming, through which it may pass away untreated, has caused this to be the first high rate method to be widely used and which use, for certain practical reasons, is likely to continue in numerous cases and especially in cold climates, in

the face of a preference by some for later types of oxidizing filters.

Percolating Filters.—This name is usually employed in England for designating beds composed of large material, through which sewage is continually percolating and passing in thin films over the surface of the material, and always in the presence of air. They are rapidly claiming attention, on account of requiring only 1-10th% of the area required by sand filters. The success of this method is naturally dependent upon the manner in which the sewage is sprinkled, which must be in sufficiently fine streams to insure that it passes over the surfaces of the pieces of material from top to bottom, in so finely divided a state, that it does not flood the air passages. There are two methods of accomplishing this, one of which is, to spray the sewage through numerous fixed sprinklers. This is effective, but may prove objectionable if in close proximity to dwellings. The other method is to sprinkle by means of mechanically operated traveling distributors, which pass backward and forward over the filter bed, or where circular beds are constructed to revolve slowly. In this way, although sewage is continually being sprinkled, only a small portion of each filter is fed at one time, the remainder resting for about seven minutes, until the next turn of the distributor.

It will be seen therefore, that there are a number of distinct ways of successfully furnishing food to sewage consuming bacteria.

Neither chemical treatment, nor the most elaborate system of strainers, can do more than partially purify sewage water. Considering, therefore, that an average of from thirty to one hundred gallons of this water is daily contributed by every inhabitant using private and public sewers, and in view of the continually increasing need of guarding all drinking water supplies from contamination, it assuredly behooves us all to see to it, that sewage is not permitted to go untreated, but that the laws governing the work of these kindly agents, which nature has provided for our use in such liberal numbers, be painstakingly complied with. Thus may we facilitate the accomplishment of their life purposes in the improvement of our water courses, and the protection of our homes. To do less than this is morally wrong, if not legally criminal.

ARCHITECTURAL REFINEMENTS

DURING the past year the art world, not only of America but of Italy, France, and England as well, has been much agitated by a theory set forth with great elaboration of detail and abundance of illustration, by Professor Goodyear of the Brooklyn Institute of Arts and Sciences, regarding certain irregularities observable in the construction of many of the most important buildings of mediæval times. Mr. Goodyear announces the discovery, in short, that the builders of that age practiced a system of refinements quite similar in intent and effect to those which have hitherto been deemed the exclusive property of the builders of the Periclean age in Greece. By a long series of patient measurements supplemented by the testimony of many carefully taken photographs, Mr. Goodyear has established the fact that there is scarcely a single mediæval building of importance which does not display surprising and, as he claims, intentional variations from the horizontal and vertical in the lines of its walls and arcades; and he has demonstrated to his own satisfaction that these are the result of the clearest intention on the part of the builders, for the purpose above suggested. This theory of Mr. Goodyear's has found some adherents, but has also, among competent critics, found some determined opponents. So widespread is the interest which mediæval architecture has always excited, even among the general public, that we deem no apology necessary for the reproduction of the essential portions of a criticism which has recently appeared in the columns of our honored contemporary the London *Architectural Review*, an excellent journal which is far from being as widely known in this country as it deserves.

The writer, Mr. Edward S. Prior, the most eminent mediævalist of England, is one who, as the *Builder* recently and justly observed, "understands the spirit of mediæval architecture better than most men." Mr. Prior's discussion not only sets forth most clearly Professor Goodyear's contentions in detail, but deals with them in such a convincing way, with so much charm of manner, and with such courteous and gentle, though none the less incisive, irony, that his comments may be read with pleasure, even where the subject matter of his discussion necessarily diverges into purely technical fields of speculation.

The first reflection, says Mr. Prior, that comes to an architect when asked to take a new view of mediæval building and accept a new explanation of its beauty is a disheartening one. We have for such a long time been endeavoring to reproduce these architectural masterpieces of the Middle Ages! There have now been some five or six successive generations of architects copying the mediæval styles, and

all to no use. Each generation of stylists has had no difficulty in showing its predecessors to have been futile and superficial.

A hundred years ago a beginning was made with battlements, pinnacles, and ogee curves, and then the Wyatts or Wyatvilles seriously copied Salisbury to give Hereford a clerestory, and with great applause reconstructed abbeys and castles for romantic clients. But immediately their successors thought little of such efforts, for with Pugin and the ecclesiologists the Gothic revival was no scenic romance, but a faith! So the tale went on, and not faith alone, but a moral purpose was found to lie in foliations and vaulted construction—the only question was as to the particular phase of mediæval architecture in which the expression was most faithful and most moral. The next generation of architects therefore studied all and every phase. They measured and modelled, till from the offices of Scott, Street, and their able pupils came works in which not only the superficial aspects, but the very anatomies of mediæval construction were revived with every section and every joint exact to the life of some period or other. Yet Pearson found he could go one better! In the dramatic intensity of his mimicry he rendered the hesitating inexperience of the Romanesque axe-choppers and detailed in all its experimenting indecision the Gothic advance from the lancet to the tracery bar. And now, when one has been to Edinburgh,* one must reconsider all this—at any rate so the Scotch reviews tell us—all this moral and religious exaltation, all these learnings of the tape and the sketch-book, all this dramatization of mediæval conditions. If Mr. Goodyear's exhibition means anything, it means that we moderns have failed—dismally failed—to produce any adequate representation of the mediæval building. And why? Because an unnoticed secret has lain hid behind the splendid shapings and bold constructions of the cathedral-builders and all the craft of their masonry. The true quality of mediæval architecture was not in such obvious things, but in *refinements*—in "optical refinements," in "perspective illusions," in "horizontal" and "vertical curves," in "leaning façades, asymmetries, and obliquities." A little wearily the architect asks, "Are we, then, to start afresh? Shall we skew our tee-squares, and crook-back our set squares? Shall we draw our elevations with the French curves and write 'deflections' and 'bends' in our specifications? Shall our quantities have it thus: 70 ft., extra only, for optical illusion?" We are told that already in the States architects are doing these things. And one feels what a pity it is that all this discovery was not promulgated

*Professor Goodyear's photographs were exhibited at Edinburgh.

in time for the Liverpool Cathedral Competition.

It is fair, however, to say that this is merely an architect's view, and not Mr. Goodyear's. Though his friends are giving New York the benefit of asymmetric planning, he himself holds to the pessimism born of past experience. He is doubtful whether even when we have specified refinements to contractors we shall succeed in getting the mediæval art into modern buildings. He is no reformer, indeed, of modern architecture, but merely concerned in the historical accuracy of research. This question of irregularity in ancient building has occupied him more or less for thirty years, and during the last ten he has visited, photographed, measured, and plumbed an extraordinary number of ancient churches—mostly in Italy, but at Constantinople also, and as near to us as Amiens and Wells. There is no question that by this hard work he has won his way to our complete acknowledgment of the facts so beautifully displayed in his exhibition at Edinburgh. If not exactly the discoverer of irregularities, he can claim to have been the first to have systematised their phenomena, and to have made it easy now for everybody else to perceive them. Mr. Goodyear's catalogue lays, perhaps, a little too much stress—quite pardonably under the circumstances—on the *hidden* grace of these refinements, which are not to be perceived by careless glances, and yield their secrets only to the initiated eye. As a matter of fact, some of these graceful obliquities have obtained the comment of observers, and the handbook of a cathedral usually points out that the Lady-chapel bends to one side as a symbol of the bent head of the Figure on the crucifix. It has also been remarked that mediæval walls are not always perfectly vertical. Indeed, the asymmetry of ancient church construction and general decoration has struck not only Ruskin, but the whole army of sketchers and measurers that have for fifty years been making drawings of churches and cathedrals. Still, Mr. Goodyear must be freely allowed the merit of giving these facts a classification and a nomenclature. His are the first steps to a scientific understanding of what his measurements and photographs triumphantly show to be accessory to so much of the ancient beauty of architecture.

It has to be added, however, that Mr. Goodyear wishes to carry us further than classification. Aim as he may at being only an accurate recorder of irregularities, he cannot help going behind the phenomena he tabulates and showing us, not the method only, but the meaning of it all. At page xiv of his classified catalogue I read as follows: "Aside from the accidental element, the builders of the Middle Ages frequently practised predetermined and carefully considered constructive arrangements which were intended to make their buildings more imposing, more attractive, and more interesting to the eye."

There can be no question that this deliberate intention is what his exhibition is designed to prove to us. He shows how such arrangements are specially observable in those cathedrals which may be taken as expressive of national aspirations, "on which therefore unusual care has been lavished," such as St. Mark's, the Duomo of Pisa, and the Notre Dame of Paris. Indeed, the title of "Architectural Refinements," applied to the exhibition, makes it quite clear that to Mr. Goodyear the irregularities found by him are not only not mistake nor accident, but are due to an intention of design—in fact are proofs of a distinct theory of beautiful creation in the art of building. The following pages will discuss this interesting point.

Mr. Goodyear's photographs supplement his nomenclature of bends, deflections, and such like. But I think the various classes of appearances may, perhaps, be better brought before the reader's eye if I take a hint from an informal summary given by him in the text of his catalogue, and arrange his phenomena thus:—

CLASS I.—Variations from regularity which have the appearance of:

- (a) Errors of measurement, such as the unequal spacing of piers in arcades or of window-widths in a series of bays.
- (b) Errors of squareness, as when transepts are not accurately at right angles to naves, or when arcade walls go canting away from a front.

CLASS II.—Irregularities which have the appearance of resulting from weak abutments or foundations, such as the spreading of arches, the curving of walls, the leaning of façades, etc.

CLASS III.—Irregularities which present themselves as seemingly due to difficulties of site, as when existing buildings cramp a rectangular setting out, or prevent the regular symmetries.

The above three classes of appearances are sufficiently common in all buildings, whether modern or ancient: the facts that they suggest have engaged the attention of all architects called upon to be surveyors. Three other classes are not so common to us.

CLASS IV.—In this I put deviations from regularity with which we have less experience in the modern building of churches, for the reason that our builders are not hampered by the necessities of a church service going on during the course of erection. Both in their buildings and additions the old builders had to provide that services should begin at the earliest date possible and not be interrupted. The choir of a new church was roofed in somehow as soon as it could be, and subsequent building had to be carried on outside its enclosure and at a disadvantage for exactly fitting the old work. So in mediæval buildings as they have come down to us there

Architectural Refinements

can be seen frequently irregularities occasioned by the retention of walls, screens, temporary roofs, etc., to the last moment, until the new work outside of them could be with great rapidity made good on to the old.

CLASS V.—There is another set of variations from formality which have also somewhat fallen out of the custom of moderns for the reason that our building is so strictly governed by the use of the drawing-board. When there was less of this drawing, the habit of the mason and the convenience of his craft made walls to batter and arches to be slightly stilted, and all the building of churches to show a host of other small manipulations away from the exact rigidity of the ruled line. Mr. Goodyear's irregularities have the appearance of sometimes being just these, and nothing else.

CLASS VI.—Finally, there are variations which have the appearance of none of the above, and may be accepted as intentional, but on other grounds than workman's habit; as, for example, when the Italian garden arranges a sham perspective; or when, to save heaven's jealousy of a too great perfection, a flaw or irregularity is purposely introduced, as is common in Eastern art.

Now, the above six appearances can, I think, comprise all Mr. Goodyear's phenomena of refinement; but however much they may appear to us so to classify themselves, Mr. Goodyear is not satisfied. He claims that, if not in all the examples given in his collection of photographs, in the bulk of them the above appearances mean nothing. What is really exhibited is an art of irregularity, a *maxima ars* which is able *celare artem*, and this was the traditional secret of design permeating mediæval building, but lost at or about the time of the Renaissance.

It is recorded that when the followers of Xeno explained their theory that movement was impossible, Diogenes got out of his tub and refuted them by walking. But all the same the Cynic missed the point, which was not that men did not appear to walk, but that there was another way of taking the appearance of it. So it is no use for the cynical critic to point to appearances and say, "These are against you, Mr. Goodyear." A philosopher is entitled to discover an interpretation different from the obvious, and to say in any particular case that a refinement may have the appearance of an irregularity or a craft-habit, and yet be due to a definite system of æsthetic design.

Taking the classes of appearances in order, Mr. Goodyear's position with regard to his critics may be put before the reader.

CLASS I.—*Errors in Measurement, in Levelness, or in Squareness.*—Every architect knows that the equalities, parallelisms, and rectangulations, which his dividers, tee-squares, set squares, etc., draw on paper so easily, are not always exactly kept in the

executed building of modern work. It is a commonplace to specify that stairs, cupboards, etc., must be made from the completed carcase and not from the drawings themselves. Architects, therefore, are accustomed to think some small inaccuracies inevitable; but Mr. Goodyear points out that his refinements are on too large a scale to be taken as due to these trivial variations. This may be so, but it may also be fairly urged that the exact habit of extreme accuracy with which we draw and set out building is a modern *refinement* for which the ancients had neither the taste nor any easy recipe. So if, despite our care and our distinct ideals of straightness and squareness, a bungle of these niceties is very general, would not such a bungle be more conspicuous in ancient building? Should we not expect that much larger irregularity which the photographs show? Mr. Goodyear is ready for this argument. "I find," he says in effect, "a very great exactness of setting out in some mediæval buildings, therefore when inexactness is distinct it must have been premeditated." Indeed, he goes further and establishes for certain buildings a modulus of error, any excess on which must, he argues, be due to intention, and not to carelessness. But can a modulus be so determined? *Humanum est errare*—in a very irregular way. The mason sets out six spaces accurately, and celebrates the event, perhaps, too lavishly one night, and the next morning "has a head" and makes a terrible break in the average of accuracy. In my observation of mediæval work the greatest accuracy of setting out is to be found in the works which show in other ways the evidence of greatest superintendence and organization. In fact, the *regularity* is the *refinement* which has to be accounted for.

CLASS II.—*Settlements, etc.*—The second class of appearances presented in his photographs—i. e., those that seem to be the bulging of walls, the flattening of arches, and the spreading of abutments—give Mr. Goodyear a great deal to say. For example, as to the cloister walls at Bologna and Verona, which have an outward curve in plan—such as has an extraordinary resemblance to that produced by thrust, for they are on upper stories—he remarks that there were no vaults to produce such a thrust. But wood ceilings and roofs, as well as vaults, can push out walls in this fashion, and we are not told that there were neither floors nor roofs. This seems an omission in his argument. Again, as to the cathedral of Vicenza, where his photographs show piers that have all the appearance of having been pushed outwards, he remarks that the side walls of the chapels abut the transverse vault arches, and that therefore no outward thrust was possible. This, of course, is true if the said walls were built before the vaulting, but if between the chapels they were of a subsequent building by even six months later than

the vaults, the elimination of thrust from the question is not so clearly demonstrated. The catalogue does not clear up this particular point.

In fact, questions of thrust and settlement are always attended with difficulty in view of the many chances that produce them; there is more than one kind of movement to be reckoned with. Deformations of walls and arches often occur in the course of building while the work is green, or as the weight of the upper portion gets its bearings. A stop of the work for a few months before the ties and bonds of a roof are in place will cause walls to shift from the upright. I remember in a church with which I had to deal how long frosts stopped work for some months. On starting to build again we found "horizontal and vertical deflections" appearing in many walls which had been built quite parallel and plumb. No cracks or ruptures were visible, for the work was too green; the movements had been gradual, and the masonry had taken the new positions as if built in them. The arcade wall, in fact, presented just the appearance that Mr. Goodyear thinks so significant at Notre-Dame, for until the ties of a roof are on, a triforium hoisted on spindles of arcade piers is as top-heavy and likely to lean as a notice-board stuck on a post.

All architects are familiar, too, with the movements of arches and vaults in the course of construction if the centerings are weak, or if they are struck too soon. Often such settlements show no signs in the finished work; but Mr. Goodyear seems sure that movements of any kind in the churches he shows must produce manifest dislocations. Now mediæval mortar was probably very slow in setting, and after considerable deformations would cohere and set solidly. Also, during the extension of building any serious breaks would be likely to be made good and show no sign if afterwards faced with marble or mosaic. In the faces of such churches as St. Mark's, or the Duomo of Pisa, cased with marble upon a core of rubble, we would not be likely now to see the dislocations that took place in the original core of the walls. I cannot, however, find that Mr. Goodyear meets this point against him by telling us distinctly that the marble cases in these instances was part of the first construction. He certainly gives us the certificates of architects, but they are far from conclusive on this particular point.

A distinct class of settlement is that which takes place after the building has got its bearings from some new shifting of the thrust and weight on the masonry. When this has been sudden, as from earthquake or tempest, dislocation of the masonry is no doubt conspicuous. But when, as in the gradual giving way of foundations—from the withdrawal of water from a subsoil, for example—the shifting of strains is slow, the compositions of walls is wonderfully tolerant of them. A solid piece of

stone can sag or bend a good deal without cracking, as can be seen in the ordinary marble chimney-piece, where the lintel slab on end, originally cut true level, is often curved down an appreciable fraction of an inch in its bearing of 4 ft. or so: the molecules of the solid marble have rearranged themselves and no crack appears. A homogeneous block of masonry is certainly as elastic: a solid pillar of it like Eddystone Lighthouse leans considerably to a wind. Therefore when Mr. Goodyear says any movement in the vaults at Amiens or in walls at Notre-Dame has been impossible because no cracks show, we can accept his conclusion as final only if we accept his philosophy altogether.

CLASS III.—*Crooked Sites, etc.*—Mr. Goodyear, of course, acknowledges that a crooked street front may be the cause of a crooked setting out; but he does not often admit this chance as a possible explanation of what he shows. Of the other chances of a site which might limit formal symmetry he takes no account. Yet the alignment of ancient buildings often compels "asymmetry" in a new building. When, for example, in St. Mark's, the new cathedral made use not only of the wall of the old basilica but of the walls of two independent buildings outside, it would be a wonder were all these of the same alignment! But in this case perhaps Mr. Goodyear admits the point, for he says he lays no stress on the "deflections of plan in St. Mark's as indicating design." Still, St. Mark's is one of his picked examples of refinement which we are told should show every class of it. He therefore should have given us this point clearly.

There are a good number of other asymmetric plans on which Mr. Goodyear does lay stress as being designed. Unfortunately the exact history of the setting out of these churches does not come so immediately to the knowledge of everybody as is the case with St. Mark's. I am bound to confess myself ignorant as to most of the sites of the churches whose asymmetric plans are given us. It is therefore with the conceit of an ignoramus I suggest that one or two may have been, like St. Mark's, built crooked because they had to be.

CLASS IV.—*Misfittings of work where alteration or stoppage of building has occurred.*—What seem to be these are in many of Mr. Goodyear's exhibits; but he evidently rejects such appearances for this reason, that the Italian churches from which he draws his examples were built straight away from set designs, and were subject to no vicissitude of subsequent re-designing, but were completed and handed over as we see churches handed over by contractors to-day. He mentions how they were built in the eleventh, twelfth, or thirteenth century, as the case may be, and no doubt follows the best authorities. Yet the idea recurs that Italian churches may have had sometimes the same sort of history that is

Architectural Refinements

familiar to us in the churches of North Europe; a history of constant unfinishing, of perpetual change of design, of addition on all sides; so that the final result as we see it, is just a medley of rebuildings. Mr. Goodyear supposes us to know that the churches he shows were not of this sort; but one wishes he could give his ignorant readers occasionally the facts he knows so well himself.

I must confess myself unable to surrender, as to some of his examples, the ideas which the examination of English cathedrals suggests. There are in our most ancient churches two particular places where we expect to find irregularities, deflections, and breaks of design. The one is some few bays to the east of the crossing, the other some few bays to the west of it. Now, in our northern churches we know what, at such places, these appearances mean. They do not show any particular architectural refinement, but indicate the history of the building—a history which may be summarised as follows:

The first building of a great church for monks or canons was to provide for their daily services. The ritual of this required a sanctuary for the main altar, a presbytery for the movement of the clergy, and a choir space for their singing. The apse met the first requirement, the bays east of the crossing and the crossing itself gave the second, and the two or three bays west of the crossing gave the third. From apse to the screen which separated the choir from the nave was the working-part of the church. It was built as a whole and kept intact during all subsequent additions and rebuildings. Continuations of the fabric and additions to it went on outside, and, when complete, were joined on. One can see how this space asserts itself in our churches, so that their lengths exhibit settings-out in three divisions: (1) that of the original service-space as above defined; (2) the completion of this first designing of the church, begun at the west end, and often only at some considerable interval made one with the first; and (3) an addition of chapels begun outside on the east, and afterwards joined on to the quire by the removal of the original apse. Now, many of Mr. Goodyear's "refinements" are the deflections, bends, and curvatures which occur just at the spots where, if this setting-out in three sections had taken place, there would be likely to be misfits. Take the plan and internal view of Fiesole Cathedral for example.

Now, Mr. Goodyear has satisfied himself that such a history as I have sketched above cannot by any possibility be supposed for this cathedral; for had it been possible, he would have dealt with this possibility. So in the case of many others, Mr. Goodyear claims that he has visited and examined all these churches and knows their history, whereas his critics know them not. The retort is a telling

one, and until I have been to Fiesole, Troja, etc., and seen for myself, my conjectures lack substance.

CLASS V.—*Masoncraft Habits*.—The Edinburgh Exhibition showed how constant in mediæval buildings was the sloping backwards of piers and arch jambs, often with a slight curvature, and Mr. Goodyear claims this as an entasis based on the tradition of the classic column. He is able to show that in many of his instances the idea of the lean having occurred through thrust is not tenable, for it is to be seen at the internal angles where thrust would not be felt. The piers which have it have evidently been built to have this backward curve. Is this, then, an architectural refinement?

His critics point to the fact that these vertical leans of pillars, etc., follow the backward slope of the walls, so that the "entasis" of the pier is really part of the "batter" of the wall. It is curious that Mr. Goodyear, in all his investigation of leans, never once uses this common word "batter"—the fact of which is as common as the word in all stone-building. Until architects came and drew their walls upright, the masoncraft of all ages and styles had been building walls to batter. It does not, therefore, seem necessary to credit the builders of Amiens with some subtle constructive skill, nor am I much impressed at Mr. Goodyear's discovery that the "Suisse" there and the "Bedeau" knew all about it. I believe, too, that the slight stilting of arches, to which Mr. Goodyear devotes many illustrations, is just another constructive expedient of stonemasonry to allow of the centres being well wedged up without their bearing on the abacus of the capitals. The setting back of pillars on an upper storey behind the line below, as at St. Mark's, is also a mason's expedient to prevent the edges of his strings being flushed off. But such possibilities do not enter into Mr. Goodyear's argument for his refinements.

CLASS VI.—*Perspective Devices*.—These are clearly not of construction but of design. Mr. Goodyear has long maintained that at Poitiers the drawing-in of the arcades to the east and the lowering of arches were designed to produce the optical illusions of a long perspective. This fact is now generally admitted, and there are other examples of the same kind, such as Bernini's staircase to the Vatican. Italian and American gardens go in for scenic illusions of this sort: they can hardly be called refinements. Their obvious artificiality bespeaks, I think, rather a coarseness of building conception. But in a less theatrical way the optical illusion has been used in all architecture to enhance the dignity of the principal or sacred object. When a floor, for example, is raised towards the east end; when the arch over the sanctuary is allowed to come below the line so as to give a space for a painting or mosaic, we can recognise such ceremonial dignity as designed—but I do not hold with Mr. Goodyear

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that the secret of it has been lost. Even before Mr. Goodyear enlightened his American friends we European architects had been making good use of such devices.

He will think this all a captious, carping way of presenting his discovery to the reader. I admit that the above very general observations are not conclusive as to any particular church in which of his own knowledge Mr. Goodyear may assert irregularities to exist such as cannot be retained in any of the above six classes. Though he throw a dozen to the wolves, he may still escape with an example which is of such undoubted designed irregularity that it may be rightly called a refinement. This position must be left unassailed. Being unable to go myself and see St. Mark's, Pisa and Fiesole, I bow to the authority of those who have seen.

It has occurred to me, however, that I have nearer at hand an irregularity which, if not recorded as yet by Mr. Goodyear, surely deserves his accurate investigation with level, tape and plumb-bob. In the cathedral of Chichester the lines of beauty so appreciated by him at Fiesole are clearly marked. To the observer standing at the west end the Purbeck strings that mark the storeys can be seen running continuously to the east, broken only at the crossing. They exhibit great sweeping curves which with tender subtlety incline inwards to the lantern arches as if they were planned to look like cupids' bows. The axial alignment is so varied that the square line at the crossing would cut the east wall some feet to the north of its middle point, and the west wall some feet to the south. And immediately that the eye is attuned to these curvatures it looks around and sees them everywhere. In all the vertical and horizontal lines of the old architecture appear delicate sinuosities. Nothing seems exactly rectangular, nothing quite plumb upright. The vaulting piers show for their height fully as much entasis as those of St. Quentin or Notre-Dame in Mr. Goodyear's photographs. Every refinement noted by him seems to have occupied the attention of the builders. The main arches of the nave have that perspective lowering towards the east which is so significant at Florence and Fiesole. There is that backward setting of piers in the upper storeys which is found on the façade of St. Mark's; the transept galleries lean away from the crossing as at Notre-Dame; the façade leans outward as at Pisa; and, rarest refinement of all, there is a bend in the plan of the west front.

Must, then, Chichester cathedral take its place with Pisa cathedral, with St. Mark's, Venice, and with Notre-Dame of Paris, as being exceptionally refined? Should it, as Mr. Goodyear says of the last, "by the multitude and complexity of its phenomena stand quite apart from other Northern cathedrals"? Before accepting the honor for Chi-

chester of being a special sampler of all the secrets of architectural refinement, I feel I ought to be as sure of its history as Mr. Goodyear is of that of Pisa and Notre-Dame. I have, therefore made a chart to indicate the positions on the ground plan of some fourteen distinct varieties of masoncraft that are to be found in its walls—the distinctions being such that they, in my opinion, represent the several works of fourteen separate generations of masons. Now what I notice is this: That the leans and the curvatures which he calls refinements seem always to require at least two of these generations of masons to perfect them. This seems the case alike with the vertical and the horizontal bends, and with the perspective illusion of the nave, the last being indicated as the achievement of two setters-out and of some one who compromised between. And as to the magnificent line of beauty shown in the horizontal curves of the strings it would seem that three generations of builders laid the groundwork of it, while to our own late days was it left and to Sir Gilbert Scott to put the finishing touches. In fact, the discovery I made is that all these refinements are not so much architectural as genealogical, for their schemes of beauty continued through many generations. Thus in 1091 Bishop Ralph laid the first arc of one great horizontal line of curvature; after some twenty years and a fire a second arc was achieved. Another eighty years elapsed, and after another fire see how Bishop Seffrid has ordered a third arc to be laid out; and then in the fulness of time has come the modern architect to complete its delicate perfection. What consummate patience and forethought! the looking forward to fires and settlements, and all the accidents of time, even to the final removal of the Arundel screen, so that the spire might fall and the lantern be rebuilt with that exact vertical elevation of piers which the tee-square designing gives! For it has been from all these happenings that there has issued the magical sweetness of the Chichester refinement.

Can one venture, then, on a theory of genealogical designing of mediæval cathedrals? Turning to Mr. Goodyear's pages, I feel that he must commit us to a distinct faith in transmigration, if not of souls, at least of a designing intelligence, elaborating beauty in cycles of building. In some hundreds of years, through all and by means of all the vicissitudes of settlement, re-designing, and casing with marble and mosaic, have been conceived and perfected the leans and curves of the consummate irregularity of St. Mark's. And almost equal thereto has been the hereditary refinement of the Notre-Dame façade. In 1208 the first masons laid out and set up its first delicate leans of eleven inches in the height of fifty feet; their successors of the next generation slowly curved the front back; and, finally, their grandchildren piously completed the ancestral design with

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the comparatively easy work of building the towers upright.

Though Mr. Goodyear is not quite explicit on the point, he very cleverly suggests how such a refinement was kept in view. The first page of his catalogue darkly hints at it in a quotation from M. Enlart: "Le monopole de la corporation semble avoir été assuré surtout par la garde jalouse d'enseignements secrets." Certainly long chains of deliberate design can be postulated only on the assumption that the art of building in the Middle Ages lay in the hands of a secret corporation, with an occult traditionary method, an inviolate law of design that had force during hundreds of years, and, however long the building, to the end shaped and perfected its construction.

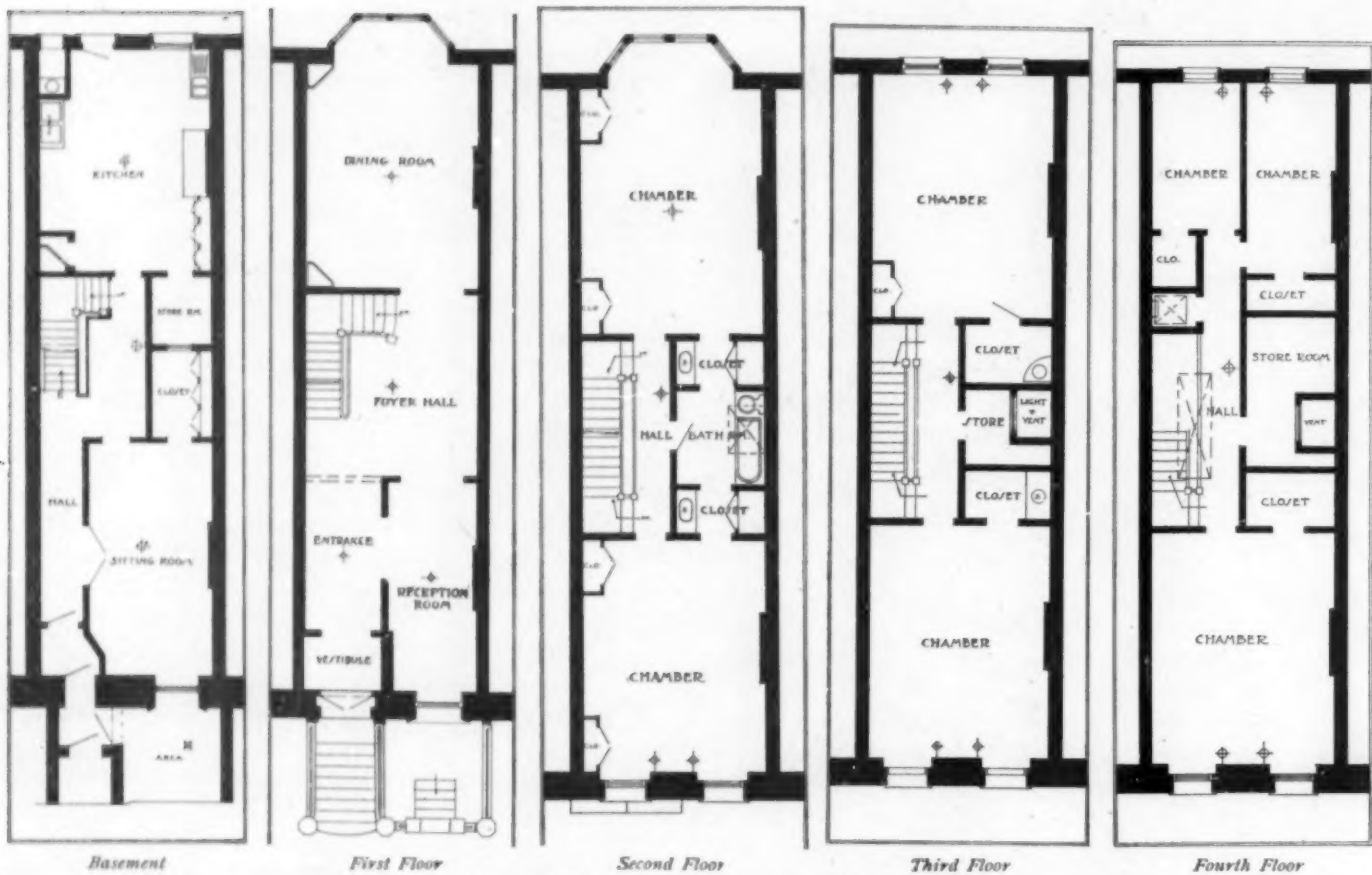
Here, then, we have the most distinct argument which I have yet come across for the existence in the Middle Ages of the Freemason Guild—those mysterious banded builders who did it all and said nothing. The whole contention as to "King Solomon and Hiram," as to the "Four Brethren," as to the "Comacine Guild," and those wandering "Lombards" who, without leaving a trace behind, built all the cathedrals—why, it all appears not only possible but probable under this new light! As certain Scotch architects, who have welcomed the Edinburgh Exhibition, say of it: "It completely revises the ordinary view of Gothic work." I conclude that Street was ill-advised, and Wyatt Papworth a shallow critic, in denying the Freemason architects. Nothing but the authority and initiation of a "mystery" could keep alive through generations and bring to perfection a scheme of design so recondite that, except on the supposition of an ineffable holiness attaching to it, it could not be perceived. Its secret was not in itself or its refinement, but in the success of its secrecy; in its masterly pretence that all the time its crooked ways were mis-measurement, accident, settlement, or some make-believe constructional necessity. Even Viollet le Duc, who was for years in charge of Notre-Dame, and knew every stone of it, never found out the secrets of these wonderful Freemasons. Let us yield to the whole fascination of Mr. Goodyear's discovery, and at one gulp take down "Comacines," "Freemasons," and "Refinements."

But I refuse to go with Mr. Goodyear on one point. He seems to reckon that the irregularities he exhibits, as well as being subtle and traditionary, are

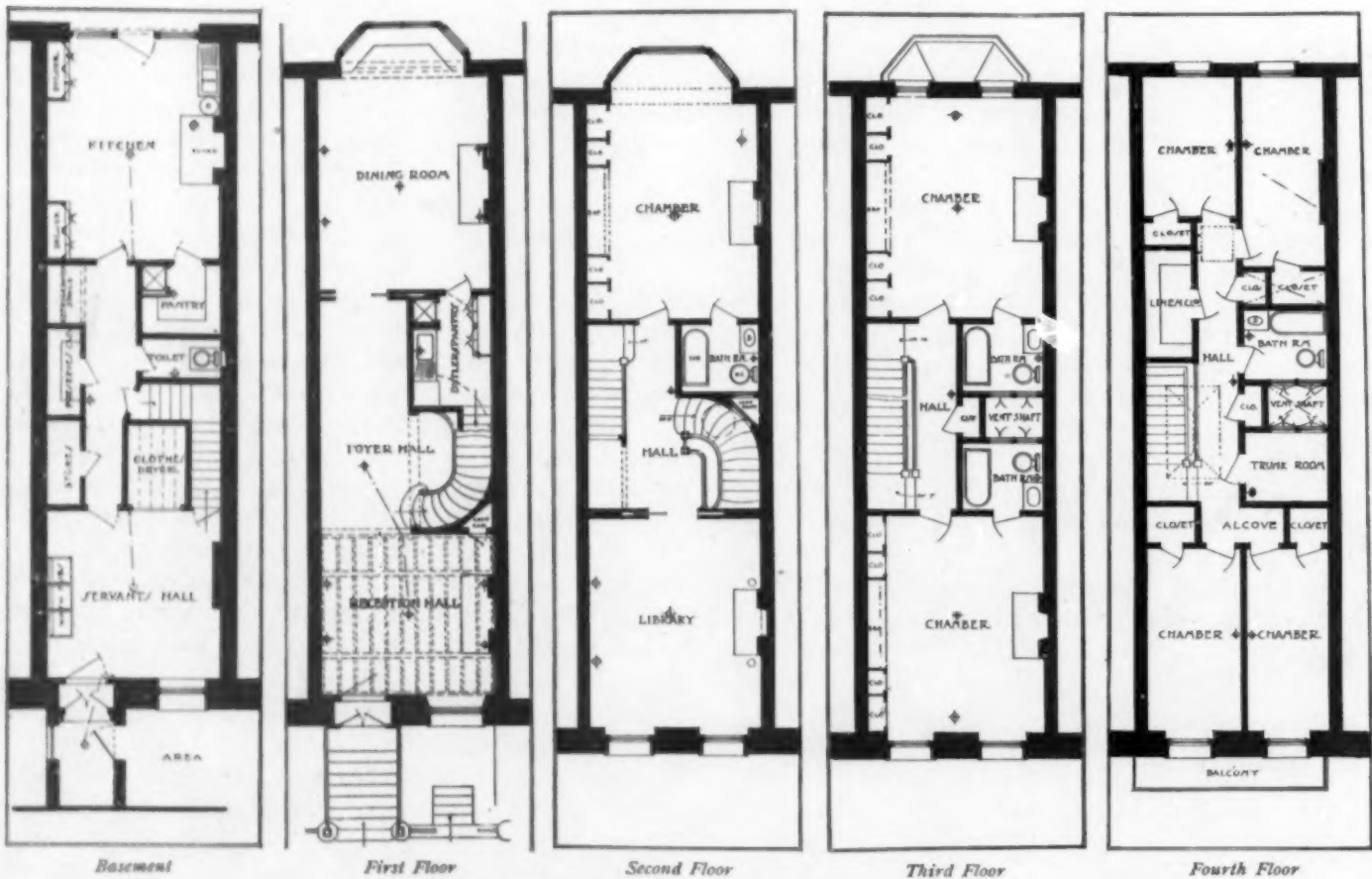
necessarily beautiful; making "building more imposing, more attractive, and more interesting to the eye"; as indeed "the necessary conditions of the creation of a work of art in architecture." Now, my objection is not that I do not think as Mr. Goodyear when I see the beauty of the mediæval cathedral, and note how haphazard and accident have woven a gauze of mystery over its shapeliness; the play of this seems inseparable from my idea of it. I had the honor, I remember, some many years ago, about the time when Mr. Goodyear began his investigations, of telling the Art Congress of Edinburgh how much the texture of ancient art made, in my sight, its beauty, which our modern building has missed. But though to my eyes this must always be so, all the same I feel that it is just association that has made roughness and irregularity seem the factors of beautiful building. We have had such a precious lot of "tee- and set-square" architecture, whereby walls have been built perfectly upright, string-courses set out dead level, and our buildings show just smoothness and mechanical perfection, and nothing else. To get into an old church where there is none of this perfection is felt to be a relief. And then through this veil of imperfection the simplicity and power of the old building appeal to us; we associate the texture with the art that lies underneath it. Our ideal of its beauty makes its skin and its life seem one. Yet on any conscious examination of the question I incline to the thought that exactness, smoothness and certainty are the real refinements which come into the making of a great work of architecture, as in everything else. And I believe that the mediæval builders just thought so too.

They had no æsthetic ambition in making walls knock-kneed and façades round-backed. They made the best of their conditions; and as practical men do now, they concealed the ugliness of accident, and still, in spite of it, and in disregard of it, strove after perfection. No more than now could the craftsman be persuaded to bungle his work. There are two classes of mind to whom the appeals of art are made—the practical and the mystic. Has not the connoisseurship of modern art in our days healthily stimulated this latter? We suffer art to lie in all sorts of recondite and subtle recipes; in all sorts of moral and secret emotions. Mr. Goodyear's gospel will be good tidings to the mystic and the idealist, but to the craftsman it is foolishness.

House and Garden



PLANS OF THE HOUSE BEFORE ALTERATION

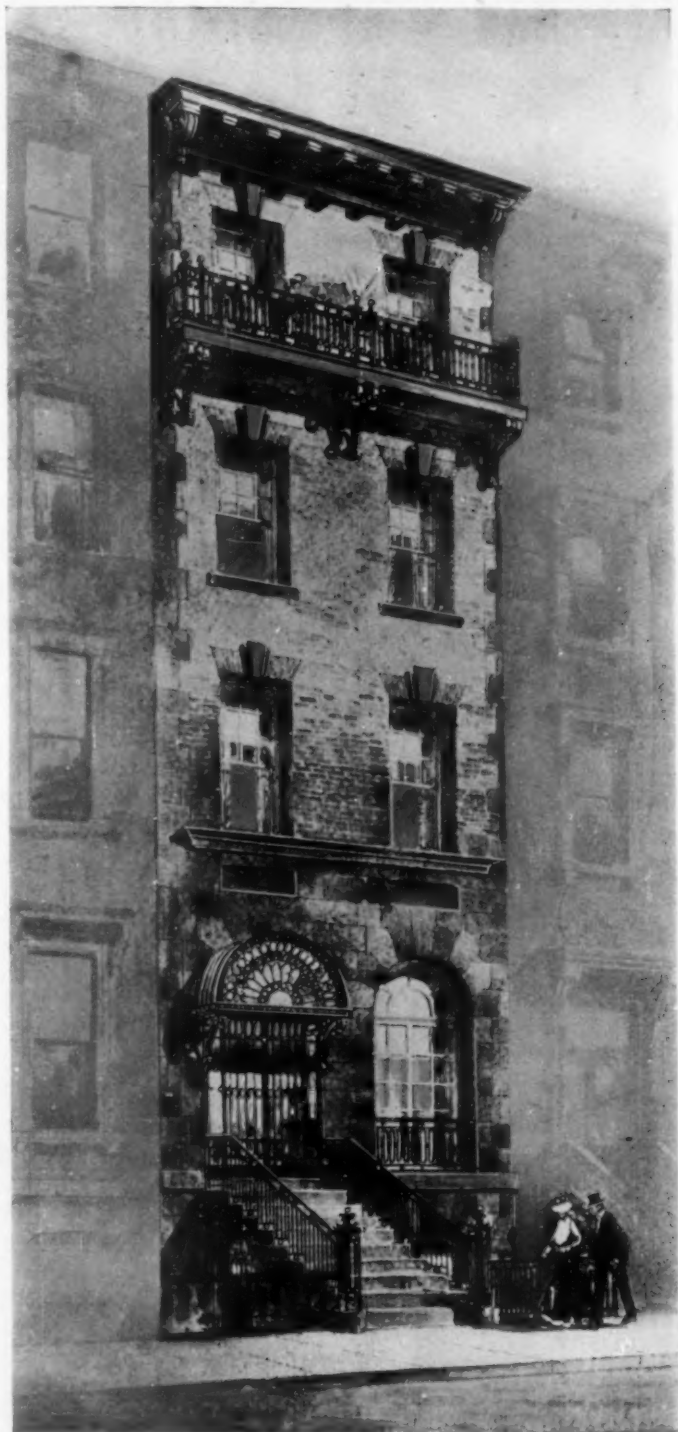


PLANS OF THE HOUSE AFTER ALTERATION

ALTERATIONS TO A CITY HOUSE

By J. M. HASKELL

THE accompanying illustrations, and the plans on the opposite page show what can be done to improve and modernize a city house of the old type whose arrangements have long since been condemned both by changes in domestic economy and by more enlightened sanitary considerations.

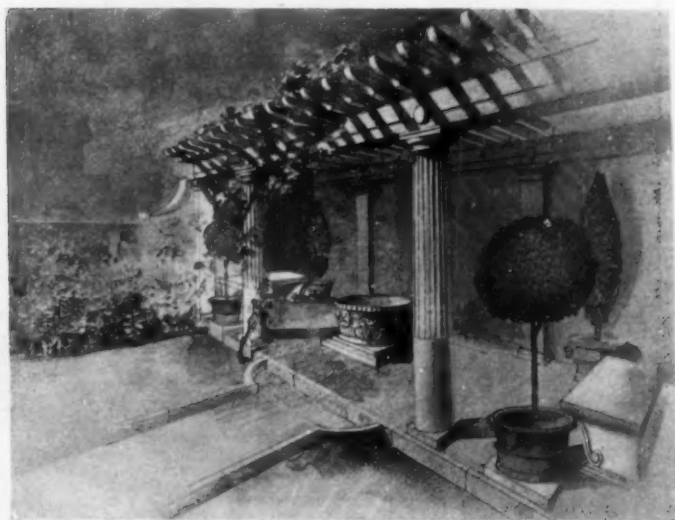


STREET FRONT AFTER ALTERATION

Usually such a house would be torn down and a house suited to current ideas erected in its place, but by careful manipulation the shell of the old house and much of the interior has been made to serve the new purpose. The chief advantages gained will be sufficiently evident on inspection. The important ones are the gain in apparent spaciousness of the interior on the first and second floors; the modernizing of the bedrooms and their accessories, the addition of the ample library or drawing-room on the second floor, and the more advantageous adjustment of the storage and closet space on all floors.

As to the exterior, the street façade has been wholly changed in expression from a commonplace flat brick front to an agreeable disposition of the windows and the entrance doorway, the fourth storey balcony and the vigorous cornice treatment, the whole harmonizing very well with somewhat similar changes in the surrounding houses due to the altered character of the neighborhood, which has become one of the desirable residential quarters of the Borough of Manhattan.

The back yard has also been wholly transformed into an agreeable garden, giving a pleasant outlook from the rear windows of the dining-room and the two principal chambers over. This house is Number 29 East 61st Street and the building operations have been carried out by Messrs. Hoggson Bros. under their new system of contracting. The sub-basement plan is not shown in our illustrations, but contains the heating apparatus, coal cellars, wine closet, storage etc. It is evidence of the labor and worry saving facilities afforded by such a method of operation.



A CORNER OF THE GARDEN

House and Garden

SOME REACTIONARY EXPERIMENTS IN ARCHITECTURE

THE desire on the part of the German Symbolists to work out their problems in architectural design with as little restraint from precedent as possible has led to the discarding of the orders, and so incidentally to the disuse of attached columns, or the pilaster treated in conventional fashion. When, then, a composition is in hand in which exigencies of plan and construction demand an emphasis of the vertical line, the symbolists have accepted the challenge and have not hesitated to suppress the horizontal line almost entirely. The results of some recent experiments in this direction are shown on this page. One cannot but feel in these examples the lack of a horizontal line and the buildings appear as if about to disintegrate. Whether these attempts serve as a warning or a stimulus will depend wholly on the point of view.



A PRIVATE HOUSE—BERLIN

At any rate reactionary experiments are always informing to the onlooker if fatal to the experimenter.



A SHOP—BERLIN



AN INSURANCE OFFICE—BERLIN

From "Architektonische Rundschau"

EXAMPLES OF DECORATIVE NEEDLEWORK

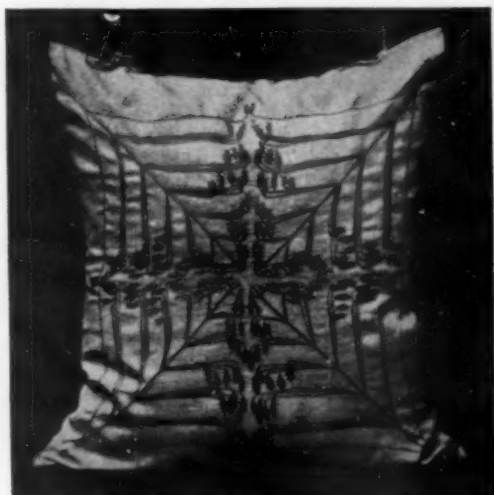
SHOWN AT THE MUNICH EXHIBITION OF 1905



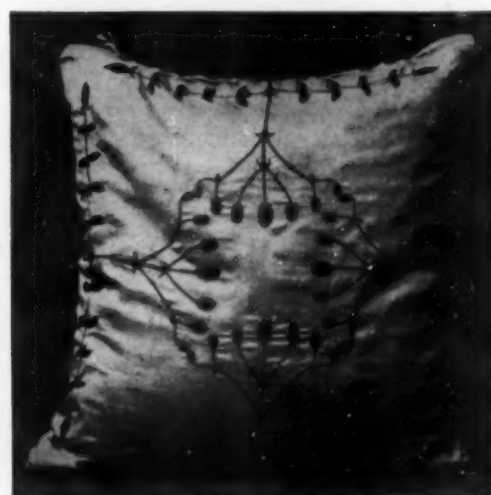
A WHITE CENTREPIECE WITH PATTERN
WORKED IN BLUE AND GREEN SILKS



GRAY-GREEN AND GOLD EMBROIDERY ON
A WHITE CENTREPIECE



CUSHION IN WHITE SILK WITH GOLD
EMBROIDERED PATTERN



A GRAY SILK CUSHION WITH PARTI-
COLORED EMBROIDERY

GARDEN WORK IN APRIL

BY ERNEST HEMMING

APRIL is the busiest month of all the year in the garden. Hitherto the gardener had to set his own pace, which made the work not altogether interesting except to the enthusiast and professional. This month, however, Nature sets the pace, everything is bursting into life, one can almost fancy he hears the activity of the myriad cells of plant life and the bursting of the buds under the influence of the sun and warm rains. It behooves the gardener to hurry or the appointed time to sow will be missed. Work with Nature and you have a generous partner, work against her or not within her laws and you will have to carry the biggest load yourself.

This month the lawn gets its first mowing, before this is done a good rolling will be very beneficial. It will remove all the small inequalities and give that smooth surface so necessary to good appearance. It is useless to roll if the ground is at all dry, after a rain while the ground is moist is when it does the most good. After the first mowing trim all the edges along the roadways and around the flower beds, as nothing will detract more from the general appearance of the place than ragged and crooked edges to the turf.

The hardy perennial border should now begin to look interesting, each day some well known, long remembered, plant will burst into bloom, forget-me-nots, leopard's bane, bleeding hearts, *Iris pumila*, English primroses and cowslips, English daisies, daffodils, moss pinks, lily-of-the-valley, violets and such like are due to bloom this month. Even the tardy fall blooming plants will have made their appearance above ground, so that their positions will be clearly defined. Now is the time to add to the collection and decide on those spaces in which to plant gladioli, dahlias and annuals. Gladioli bulbs should be planted at intervals through the spring months so as to insure a succession. Plant the bulbs about three inches below the surface and mark the position with a neat stake. It will be there when needed to support them. This is very necessary with dahlias as they grow very quickly and soon get top heavy and liable to be broken by the wind, if not constantly tied up.

Dahlias should not be planted until all danger of frost is past as they are very susceptible to cold. The latter end of the month or in early May being quite time enough.

The proper time to sow annual flower seeds is best decided by the condition of the ground. When it crumbles easily and yet is not too dry. Most seeds are very fine and there is always a danger of covering them too deep. In most cases it is not necessary

to cover at all, rake the ground fine, sprinkle the seed and firm down with the back of the spade, then sprinkle with a fine spray. The following is a good selection of annuals to sow in positions where they may be allowed to flower without being transplanted. Shirley poppies, *Pbiox Drummondii*, sweet alyssum, nasturtium, *Dianthus Chinensis*, *Eschscholtzia Calendula*, calliopsis, *Chrysanthemum coronarium*, portulacca, *Salpiglossis*, and annual larkspurs.

The shrubby borders will soon be at their best as by far the great majority of them bloom in the spring. The golden bell, English dogwood, pussy willow and *Pyrus Japonica* are among the first to bloom but are soon followed by a host of others. If they received attention as advised in March little more will be necessary except to enjoy them, and a good thing too, for the vegetable garden requires every moment of time. If there are good strong roots of pie plant growing in the garden, knock the end out of barrels and put over them, packing stable manure around the outside, this will give long tender stalks two or three weeks sooner than that not similarly treated. Take off the covering of the strawberry beds if they have been too heavily mulched. The clusters of blossoms will very soon appear. After hoeing and cleaning up the beds, it is a good plan to spread the lawn grass cut by the machine around the strawberry plants, it keeps the ground cool in dry weather and the fruit from coming in contact with the earth and being splashed with heavy rains.

The vegetable garden should now be manured and dug or ploughed as soon as possible. Manure enters largely into gardening operations for this month, and should receive the consideration it deserves. Those having a good supply available are fortunate, for with judicious use the crops will be correspondingly large. Although there are quite a number of good artificial fertilizers on the market, the best all-round manure for the garden is that from the cow barns, next comes stable manure. They both add humus to the soil as well as plant foods. Both should be well rotted and incorporated with the soil.

There is a prevailing impression that leaf mould from the woods is rich, but it is the poorest kind of soil for vegetables and the majority of flowers and not to be compared with good loam from the open fields. Lime can be used to an advantage in most old gardens, but it has a tendency to impoverish the soil, its properties being to make plant foods that are already in the soil available rather than add anything to it.

The early crops that were planted last month should be hoed just as soon as the rows can be dis-

Civic Improvement Notes

tinguished. This to many may seem unnecessary, but the best time to kill weeds is just as they are germinating, as they will be by the million. "A stitch in time" is very applicable in this case. Don't wait until the weeds show themselves. The hoeing will also help to keep the ground in a nice loose condition so essential to growing crops.

Practically all garden crops may be planted this month. The first seeds to be sown are onions, lettuce, radish, cabbage, cauliflower, parsley, spinach, salsify, parsnips, carrots, peas and leeks. These may be followed towards the end of the month by French and Lima beans, tomatoes, corn,

peppers, cucumbers and melons, depending somewhat on the locality and the condition of the ground.

A corner of the garden should be reserved for the old-fashioned pot herbs. They are always welcome to the good housewife, parsley for garnishing, mint for mint sauce, tarragon for flavoring vinegar, thyme, sage, sweet marjoram, chives for seasoning, chamomile, horehound, wormwood, tansy, boneset for medicinal purposes. With the exception of parsley one or two roots of these will be found sufficient for the average family, and it will be more economical to purchase a plant of each than to attempt to raise them from seeds.

CIVIC IMPROVEMENT NOTES

RECENT ACTIVITY IN THE SOUTHERN STATES

MR. John Nolen, author of the interesting papers on the work of the late Frederick Law Olmsted, and a prominent member of the American Civic Association, has recently returned from an extended trip through the South. Mr. Nolen reports that one from the North or East cannot fail to be surprised and impressed at the healthy stir and improvement that represent the present prosperity in the Southern States.

"But more striking still and more significant," he says, "is the fact that the interest in higher things,—in art and in beauty,—does not seem to follow material well-being as is usually the case, but to be actually *coincident* with it. In this way the true and essential spirit of the Southern people finds its natural expression.

"It is not a new life; it is simply the reawakening of the better part of the old which has been ready to respond at a moment's notice. It is noticeable, moreover, that this keen interest in the larger and better things of life, especially in all forms of outdoor art, is in no sense confined to rich and well-to-do people; it extends to nearly all classes and is especially noteworthy in the agitation for public improvements.

"More than half my time on this recent visit was occupied with public or semi-public work; such, for example, as the Charlotte (N. C.) Park and Tree Commission, the Municipal League of Greenville (S. C.), the Thomasville (N. C.) Orphanage and Davidson College. The Park Commission of Charlotte has had plans made for important improvements to Vance Square and Cemetery Square near the centre of the city, and is about to undertake work on Independence Park in the suburbs, an unusually appropriate and attractive piece of property for park purposes. The

Municipal League of Greenville has taken definite steps looking toward the organization of a Park Commission in that city. The management of the Thomasville Orphanage has adopted a plan of improvements including a complete system of paths and drives. The President of Davidson College is taking definite action toward the location of new buildings that will soon be necessary from the rapid growth of this institution's enrollment.

"A visit to the mill village of the Monaghan Mills at Greenville, S. C., in company with its public spirited president, Mr. Thomas F. Parker, was full of interest. The mill is situated on high ground, from which a fine view of the Blue Ridge Mountains can be obtained. The property includes an area of over three hundred acres, and around the mill are clustered cottages of the operatives. Each family has a house of its own with a small plot for vegetables and flowers. Everything possible is done to awaken an interest in gardening; seeds are provided free of charge and flowering shrubs at a nominal cost. Many of the families have their cows and pigs and some of them horses. These are all kept in barns and free pastures are provided by the company. Mr. Parker is deeply interested in the comfort and convenience of the mill hands and in the good appearance of the grounds surrounding their homes. Improvements however, must be made slowly, as the total cost of small improvement is very great when multiplied by the number of houses on the company's grounds. A good school and kindergarten are provided for the children and they are kept open ten months in the year. There is also a church, a public hall, Y. M. C. A. and a Y. W. C. A. The rent of the mill cottage is low, the charge being seventy-five cents per room per month, which includes gardens, pastures, and so on."

House and Garden

A MUNICIPAL MUSEUM

THE conception of a museum of this character for Chicago was suggested by some significant groups of municipal exhibits shown at the St. Louis exposition. The German cities, fresh from the Dresden municipal exposition of the year before, brought to St. Louis some of their most beautiful and instructive exhibits relating to hygiene, housing, parks, recreation and public art. A few American cities, in response to a plan finely conceived but imperfectly executed, built houses in the so-called "Model Street" and installed exhibits more or less completely illustrating their individual activities. New York, San Francisco, St. Paul and Minneapolis under the name of the 'Twin Cities,' Boston and Kansas City divided the honors in the American municipal section. An exhibit of the city of Paris was to be seen in the French pavilion, and creditable exhibits were shown by several minor French and English cities, Budapest and Buenos Ayres. So suggestive was the showing made that not a few were impressed with the latent possibilities in the Municipal Museum idea, but, like so many other good things, it was left to Miss Addams to make it "come true."

It is plain that the lines along which it is proposed to develop the Municipal Museum are ambitious ones and that the scheme is capable of almost indefinite expansion although, fortunately, most of the material may be presented in fairly compact form if necessary. With space and with money—not an enormous amount, but sufficient—the institution may be so ordered as to become a great educational factor in the community, supplementing in countless directions the work of the library and the school. The material employed is chiefly that of maps, models, charts, matter pictorial and statistical, etc. If allowed to reach its logical development the museum should become a dynamic university, teaching its lessons through the eye rather than through the ear and the printed page; selecting, valuing and placing the emphasis by the use of color and form so that it shall come to pass, in very truth, that he who runs may read.

The daily attendance since the opening of the museum has ranged from two hundred to two thousand people. The fact that the museum is centrally located, that admission is free, that the exhibits deal in a fresh and graphic fashion with the simplest and most vital concerns of life, that a point is made of the interpretation of the exhibits to the visitors—in short that the museum is *alive*—is no doubt responsible for its cordial reception. The museum serves as one of the means of communication between the central office of the American Civic Association and its Chicago branches and members.

THE IMPORTANCE OF ARBOR DAY

PENNSYLVANIA has two Arbor Days, one in spring and the other in fall, but so far as our experience in Allentown goes, says "The Register," of that city, the law that created these days, is practically a dead-letter. It is true that the day is observed in spirit, but literary programs do not plant trees, neither do they preserve the forests.

What is needed here, as in many other places, is the creation of that sentiment which brings about practical results and some of the people of St. Louis have adopted an idea that would work well in Allentown.

In that city they have a Civic Improvement League and to stimulate public interest in the work the Tree Planting Committee of the organization has issued an announcement to the school children relative to the \$500 in prizes which are to be distributed June 1, 1906, for the largest number of contracts made by pupils with responsible property owners for the planting of trees on the streets of St. Louis.

With the announcement of the contest the league is sending out a pamphlet containing the joint recommendations of the Tree Planting Committee of the league and the Engelmann Botanical Club. The report of the committee gives the following six reasons for the planting of trees:

1. They increase the value of surrounding property.
2. They protect the pavement from the heat of the sun.
3. They add beauty and comfort to the city streets.
4. They cool the air in summer and radiate the warmth in winter.
5. They purify the air; the leaves inhale carbonic acid gas and exhale oxygen.
6. They aid in counteracting the unnatural conditions of city life.

The committee suggests these ten different species for the streets: Soft maple, hard maple, sycamore, American elm, white birch, Carolina poplar, Lombardy poplar, European cottonwood and the pin oak.

The committee urges the residents along any given street to meet and agree upon one kind of tree for that street, claiming that the beauty of the tree avenue depends much upon the planting of uniform species.

The report suggests that trees may be planted in the spring or fall, but preferably in the spring; that they should be planted about 25 feet apart, and that no tree should be planted which is not inclosed in a suitable guard.

HOUSE AND GARDEN CORRESPONDENCE

A MODIFIED ITALIAN GARDEN

Miss E. G. G. writes:

I have recently acquired a place in Southern California. There is an old rose garden which, while rioting in color and luxuriant growth, has at present no special meaning. I wish to bring out of this, something which will at least suggest a modified Italian garden. Is it possible to get garden seats, vases, fountains, etc. at prices at all possible to one of moderate means? If you will furnish me with the address of a dealer from whom these can be obtained I will appreciate it greatly.

Also suggest to me the best place for a fountain. There is a high wall on the south side of the garden, would you advise a wall fountain?

In regard to the decoration of your "Modified Italian Garden," I would suggest that against the south wall which you describe, you set one of the stone wall fountains, similar to the one in the illustration here shown. These are very beautiful and come in white marble, or grey stone, exquisitely carved. Near-by place a garden seat like the one shown in the picture.



BOWL FOR A WALL FOUNTAIN



GARDEN SEAT

It is not now so impossible for Americans of moderate means to obtain these delightful bits of garden furnishing, as formerly. There is at present a movement on foot by an Italian Art Company to furnish these at wonderfully low prices. They are all hand carved and landed in this country duty paid, and are not at all beyond the reach of the ordinary purse. With the roses you describe as growing soluxuriantly in this garden the effect will be most charming.

The garden seat stands three feet from the ground, and is six feet in length. The wall fountain is five feet high.

MARGARET GREENLEAF.

THE WELL BUILT HOUSE

Will you please inform me regarding common practice relating to an architect's superintendence. I am about to build a house costing about \$35,000. My architect urges the employment of a superintendent who is to report to him but be paid by me. I find in the Institute schedule of charges that superintendence is included in the architect's fee of five per cent. Is my architect justified in his demand and if I accede to it will I get an adequate return for the additional expenditure?

B. M. S.

The schedule of charges of the American Institute of Architects is not binding upon any architect, even though himself a member of the Institute. The schedule is published as representing a scale of professional charges which, in the opinion of members of the Institute, represents a reasonable minimum below which an architect cannot afford to offer his services. Both law (as represented by numerous court decisions) and custom restrict the "superintendence" of the architect to such visits as will enable him to satisfy himself that there has been a reasonable compliance with the terms of the contract. Certainty that there has been exact compliance with respect to all the minutiae of the specifications, even with the best intentions on the part of the builder, cannot be had without continuous and unremitting inspection by some skilled person representing the owner's interests. It is obvious that the architect cannot give this out of his own time, nor does his fee contemplate such an expense on his part. For a house costing the sum you mention the twelve or fifteen hundred dollars which you would have to pay for special superintendence would more than pay for itself by securing the quantities and qualities demanded by the specifications and drawings, added to which you would have the satisfaction of knowing that you had secured them and you would also have (what is quite as important) an exact check on all extras

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ordered, or counter claims on the part of the contractor. It is usual for the superintendent to make a weekly report in detail—a log, in fact—of all that has happened during the preceding six working days, so that any doubtful questions which may arise incident to the closing of the transaction are specifically covered by notes made at the time. C. E.

FLOWER HOLDERS

How are the flowers held in place in the baskets or other large receptacles shown in Mr. Egan's article in House and Garden for March. C. R. B.

Wire frames for open mouthed vases, made by any tinner, are useful when handling heavy topped flowers, as each may be separated and held in place. The mesh should be an inch wide, the lower one half an inch from the bottom, the upper one same distance from the top of the vase. Copper or galvanized wire may be used. For large bouquets, fancy waste baskets or the ordinary oval shaped baskets may be used. A tin lining is first made, and fitted into it is placed a wire frame similar in construction to those used in vases, only it is made to conform to the outlines of the basket. Where the waste basket is used, if it is deep and narrow mouthed, the wire frame is not needed but a tin cylinder is necessary. W. C. E.

RECEPTION ROOM AND BATH ROOMS

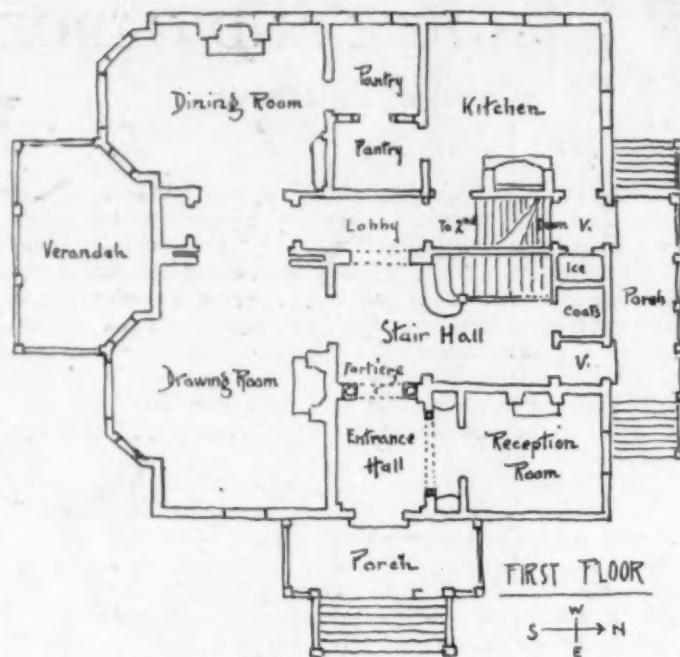
I have been awaiting with much interest the appearance of the promised papers on House Planning announced for publication in House and Garden sometime ago and, pending their appearance, would like to ask for advice regarding the following points. (1) What are the relative advantages and disadvantages of the little "two by four" reception-room sometimes met with in modern houses? (2) How far is it advisable to provide a separate bath room for each bedroom, having regard for cost, convenience, and "sewer gas?" A reply at your earliest convenience will greatly oblige, as I am considering the plans of a new house for myself. J. J. S.

The papers on house planning to which our correspondent refers have been in preparation for sometime, but their publication has been delayed by various causes which have made the collecting of the examples taken from actual practice needed to adequately illustrate them a much slower process than was imagined when the papers were undertaken. While it is not yet possible to fix a date for their appearance, it is expected that they will begin to appear in one of our succeeding issues.

As to the definite cases cited by our correspondent, the following answers may be made.

(1) Objection to the small "reception-room," properly so called, which is found in many recent plans arises from two causes. First, because its purpose is not understood and it is accordingly misused even when correctly placed upon the plan, and, second, because from a misunderstanding of its intended or proper use, it is improperly placed upon the plan, improperly that is with respect to its relation to other rooms.

It must not be forgotten that a plan, like other complex organisms, has been put together to serve certain ends, and that each of its component parts has, likewise, a specific function to perform. If the intentions of the designer are misunderstood, or if he has presumed too far upon the delicacy of perception of his client, the plan, both as a whole and in detail, will be misused, and the users will be accordingly inconvenienced. In this case the plan is not



PLAN SHOWING THE CORRECT POSITION FOR THE RECEPTION ROOM

a good one because it does not accord with the domestic habits of its occupiers. The writer had occasion not long ago to visit an old house of the colonial type which was in the last stages of degradation from long abandonment and misuse and was about to be torn down to make way for a new street through the old estate. A family of rag pickers had squatted in the house, and the drawing room, a mere shadow of its splendid past served as their living-room, kitchen and dining-room, all in one, while the library served as the common family bedroom. There was of course no sink in the drawing-room, nor were there toilet facilities in the library, and though these were provided elsewhere in the house, the present occupiers preferred to live more compactly than the original owners, and apparently did not mind the infrequent journeys to other parts of the house for water or waste.

Here we have an extreme case where a plan, originally excellent and agreeable, has become a bad plan, because ill suited to the needs and tastes of the users. So it is with the room in question.

The accompanying sketch shows the right position of the reception-room and its correct relation to the principal entrance door, the stair hall, and the drawing-room. The reception-room is intended to serve, as its name indicates, as a room of first reception for all persons, other than members of the family or their most intimate friends, who may pass inside the front door. Here are dealt with the majority of such persons who thus penetrate no further into the house, and so is preserved the privacy of the family life, which is the most essential and fundamental condition of a successful home. By means of such an arrangement, the family comes and goes freely regardless of unsympathetic or unwelcome callers.

As to your second query, it is to be said that the ideal condition is one in which every member of the family has his or her own private bath and toilet room. Every consideration of self respect demands such an arrangement and in American houses of the best class this provision is regarded as absolutely essential. No fear of "sewer gas," that exploded bugaboo, need be taken into consideration as the most elemental precautions are sufficient to guard against any danger in that direction. Cost is the controlling element. C. E.