

A Greenhouse for the Amateur.

A properly constructed and well kept greenhouse is a source of delight to all who enter it. Those of us who have none of our own visit that of another and delight in the variety of beautiful foliage and flowers, and the sweet delicious summer atmosphere. The owner of the greenhouse delights in the artistic arrangement of his plants, in the different varieties he has produced for himself, and in showing to others the beauty of his flowers, the successful results of his work.

During our long severe winters here in Kansas, there is no place where we will sooner forget that outside the snow is drifting and the thermometer standing at 25° below zero than in the so called greenhouse. There is no place where we more quickly get thoroughly "thawed out" and forget but that it is summer as among the plants in the flower scented atmosphere and even temperature of the greenhouse.

To build a greenhouse the first thing to think of is the situation, and in so doing the amateur should remember that the questions of accessibility and drainage are of great importance. The house, of course, if not joining the dwelling house should be placed near it, in an open sunny spot and where the soil is well drained.

Near the house, because you would probably never want to visit your greenhouse more than in times of bad weather, and in a sunny place and where the soil is well drained because sunlight and good drainage are essential to plant growth. The direction should be north and south the roof sloping east and west. In this way the plants receive more sunlight than they would if the house stood in any other direction.

Before constructing his plant house the sensible amateur will also come to the decision to have a very plain substantial one well adapted to plant culture rather than one "fixy" with decorations wherein nothing but such plants as mildew will thrive well. The house may be as long as he chooses to have it. In case there are to be but two stages for plants, a suitable width is eleven feet. The stages running lengthwise along the side walls may be $4\frac{1}{2}$ ft wide, and this will leave an aisle between them two feet in width. But we will suppose our amateur to have money and land enough to allow his house to be twelve feet wide and thus enable him to have three benches for plants instead of two; that is, beside the two side benches which in this case should be about 3 ft wide, there would be a central stage, thus making three benches and two aisles instead of two benches and one aisle. The walls at the eaves are about four feet high and at the ridge of the roof about eight feet inside. In order that the heat be well utilized the house may be built

in an excavation. This not only economises heat but so arranges it that the walls on the outside are protected by the earth and so need no outside finish. The rack bars should be as light as is consistent with the strength required so as to obstruct the rays of the sun as little as possible. But in thinking of the construction, the dimensions and the roof, we should not forget that ventilation is very important. For good ventilation windows are placed in the roof, and sometimes side ventilators made under the benches. Plants, as well as people, need fresh air, and it is just as important for their welfare that ample means for ventilation be provided.

There are various modes of heating the greenhouse, but the best now in use is that of hot water heating. One of the neatest boilers for hot water heating is the Hitchings base burner. The furnace is made with double walls all around, except a place left for draft, and between the iron walls is placed the water. From the boiler proceed four-inch iron pipes which are laid horizontally around the greenhouse beneath the benches. The hot water rising passes from the boiler by the flow pipe and in passing around loses its heat and returns cool to the bottom of the boiler by what is called the return pipe. Thus is kept up a continual circulation and an even temperature. At the highest point of the flow pipe where it turns from the boiler is a vent for the escape of steam, and near the boiler in both the flow and the return each system is controlled by water tight valves, so that if the pipes in any place should

burst the water could be easily controlled. The pipes are in lengths of nine feet, and at the joints are packed with red lead and where. If the arrangement is as it should be there is little danger of bursting, and of all the methods of heating this system in the long run is the cheapest and safest.

It is best for all the plants to be placed as near the glass as possible for in this way they will derive more heat from the sun. The tallest plants may be placed on the central stage and the shorter ones on the side stages.

It is important to remember that plants in winter need less water than in summer. In the winter it is only necessary to water them when the soil seems a little dry. There is less evaporation in winter and besides this water attracts frost and the plants are more likely to freeze if watered a great deal. But in hot dry weather greenhouse plants should be watered every evening. The plants must have good drainage. Otherwise the soil will become soaked and sour and packed, the roots get no air, and consequently the plant stops growing.

Of the plants suitable to greenhouse culture, the most common is the geranium. We could not think of a greenhouse complete without it. Most of the great many beautiful varieties of geranium are produced by hybridization. Some may be grown to almost shrubby forms while others are small and compact. The begonia is almost as common as the geranium, and of many of the varieties the foliage is heavy

and the flowers small, very delicate and pretty.

The peluria, chrysanthemum, China prim rose, verbenas, carnations, anacallis, the highly ornamental azalea, the cineraria, dianthus, and various ferns are all indispensable greenhouse plants. And the fuschia — if it should be forgotten the greenhouse would always have a look of something wanted. I know of no other plant that will give an aisle of the greenhouse a more beautiful and bowerlike appearance. When grown in tree like forms three to four feet high and arranged on both sides of the aisle, the branches with their rich profusion of gracefully drooping flowers meet above the aisle and form a complete canopy of bright blossoms. The oleander is a beautiful greenhouse plant though not as commonly grown as some others. The class of abutilon plants produces handsome flowers. The greenhouse roses are among the sweetest and most beautiful, if not the most beautiful of all greenhouse plants. The lover of roses derives more pleasure from them than from out door roses, not only because of their early appearance, but also the splendor of their flowers, their delicate texture and delicious fragrance. The tea roses and their allies are well adapted to greenhouse culture being too tender for out door growth. Those most commonly grown in the greenhouse are, The Bride, white; American Beauty pink; La France, deep pink; Bos Siles pink, and one of the finest of roses the Marechal Niel, yellow, a climbing

rose of the Holiest group.

There are many other green house plants equally as important as those mentioned, and the amateur by using his good sense, and sound judgment will obtain very many different kinds of plants, arrange them in the most harmonious way, keep them in a good healthy condition and thus make for himself a first class green-house.

The uses of the green house as a source of comfort, interest and pleasure are many and varied. From the time when Eve first plucked the flowers of Paradise on up to the present time her sons and daughters have dearly loved "earth's fairest jewels". It is because of this long continued and universal admiration that people take such delight in seeing flowers, in planting and caring for them at all seasons of the year. The beauty these cared for flowers give as decorations, the pleasure they add to joyful occasions, the comfort they bring in times of sadness, are all testimonies of the fact that green house flowers doubly repay for the work, the time and money spent in constructions and conveniences for their culture.

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